

Victim Management and Identification after the World Trade Center Collapse

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Introduction

This paper focuses on the social and organizational processes at work in the management of the mass casualties and victim identification after the collapse of the World Trade Center towers in New York City on September 11, 2001, with special emphasis on how the unusual circumstances of this disaster affected victim recovery and identification processes. This aspect of disaster research has not been widely studied because in most instances these processes are managed in a relatively routine manner. Owing to the nature of the destruction in New York City and the disruption of normal social and administrative systems, a new set of mechanisms was developed to undertake post-event victim location and identification.

The collapse of the World Trade Center was unusual in many ways, particularly in the area of victim identification and management. The examination of characteristics of this case, in what we are calling a “mega-casualty incident,”¹ has focused attention on the manner in which this event differed from other disasters.

This research builds on an initial quick response grant supported by National Science Foundation, which enabled the authors to visit New York and Ground Zero 14 days after the event to observe the disaster response and to conduct semi-structured interviews with personnel in several agencies involved with victim management. We were able to conduct semi-structured interviews with representatives of the Greater New York Hospital Association, which established and coordinated the official patient locator

system on its website; several area hospitals; and (because we are using a broad definition of “victim”) the Deputy Executive Director for New York City’s Center for Animal Care and Control. The research team also observed activities at the Family Assistance Center at Pier 94 (the central location to obtain disaster assistance), the City Disaster Command Center and Emergency Operations Center at Pier 92, several New York City Fire Department locations, and other disaster-related sites. We also met with Professor Rae Zimmerman, New York University, who was designated by the National Science Foundation as the research facilitator for the Quick Response Program. Additional data were collected through extensive analysis of published reports in the *New York Times* and other publications.

One of the gripping scenes that found media attention in the first three days of the aftermath was the difficulty many experienced in trying to find information about their family members and loved ones. Media clips showed people going from hospital to hospital, desperately seeking information. It was clear to most who were watching those clips that the system was not very effective in providing information to those who needed it most. These scenes led to the initial quick response grant to examine victim identification issues. That research has since been broadened to also explore other issues, such as victim assistance and the collection and distribution of aid.

The Research Questions

The questions initially posed were direct and straightforward—how did the victim identification process work (or not work) in this event? What were the circumstances that made the process different in this case, and how might the process be changed in the future? To explore these questions the authors used several sources of information: a small set of interviews, on-site observation, newspaper and other current accounts, as well as a comparative search of how these issues have been handled in parallel disaster situations in the literature.

Unusual Aspects of the Disaster in New York City

Four aspects of the collapse of the World Trade Center are important when examining how the victim recovery and identification processes were undertaken in New York City: (1) the nature of the disaster scene, (2) the delayed collapse of the towers, (3) the unique characteristics of the disaster itself, and (4) the relatively large loss of life. Each of these observations highlights the extent to which this event deviated from what we might call a “normal” disaster.

First, and most importantly, the response activities at Ground Zero were shaped by the fact that the scene was simultaneously considered a disaster area, a crime scene, and—it was soon realized—a mass grave. Among other things, this meant that the routinization of recovery activities that typically

takes place soon after a disaster, was instead spread out over a much longer period as new processes were established. Sifting debris for evidence, human remains, and personal effects took considerable time. It also resulted in conflict and confusion between and among different official response agencies, non-governmental organizations, and families and friends of victims as they struggled over competing needs and priorities. For example, while the mayor's office considered a rapid cleanup of debris a high priority (the mayor was quoted as saying that he would like the site cleared by the time he left office on December 31, 2001), others were concerned that debris removal was being done at the expense of searching for bodies and remains. One example of this conflict was the well-publicized scuffle that took place between New York City firefighters and police in early November after the mayor's office announced that the number of people searching for human remains would be cut back so that more heavy equipment could be used at the site.

Second, the fact that the World Trade Center remained standing for a short period of time after the plane crashes allowed official responders—primarily firefighters from the New York City Fire Department—to mobilize in advance of the main devastation of the subsequent collapse of the buildings. Tragically, this caused many official response personnel to become victims themselves. Thus, while many disasters are of the “hit and run” variety (i.e., the disaster agent has a well-defined time frame for its impact), this event was actually two disasters: the initial impact of the airliners, followed by the collapse of the towers. There have been no similar examples of large losses of response personnel that are affected by a secondary disaster event. More research will be needed in this area.

Third, a combination of factors, including the cause of the disaster (a surprise terrorist attack), the scope of the physical destruction, the nature of the targets (the World Trade Center towers were widely considered to be symbols of American economic might), the ongoing threat of further attacks, and the fact that events were televised live to a horrified nation, placed considerable pressures on government officials to act swiftly to identify and quantify the missing and the dead. Since it was impossible to know who was at the World Trade Center on that morning, unlike in airline crashes where a flight manifest is available, and it was not known who among those at the scene were injured and taken to hospitals and who were killed, the official numbers of missing and dead released in the first six weeks varied considerably from day to day (see Table 1). The effort to quantify number of victims was also complicated by the fact that several news organizations, such as the Associated Press, *USA Today*, and the *New York Times*, among others, began calculating and reporting their own “unofficial” numbers.

Finally, until September 11th, a mass casualty disaster in contemporary America usually involved at most 200 or so victims. The disaster in New York not only produced many more victims, but the destructive forces

unleashed were among the worst of U.S. disasters experienced in our lifetimes. The forces at work (identified in more detail below) meant that for the first time in the modern U.S. experience, there would likely be hundreds of victims who cannot be positively identified. Prior experiences from airline crashes, or the Oklahoma City bombing, involved numbers in the hundreds, while the numbers in this event were of another magnitude.

Victim Management Activities

Immediately after large-scale disasters, several activities related to the management of victims, including both the injured and the dead, typically take place. These activities can be divided into four broad, sometimes overlapping, phases: search and rescue; recovery of bodies and human remains; identification of victims; and the disposition of bodies (Blanshan, 1977; Blanshan and Quarentelli, 1981). Although the manner in which these four activities unfold depends upon such factors as the scope of the disaster, the number and location of victims, and the availability of adequate resources, equipment, and response personnel, two generalizations about the management of victims seem warranted. First, the time frame for locating, identifying, and handling victims is generally fairly short. Time is obviously an important factor in saving the lives of those who are injured and, in many cultures, retrieving human remains quickly so that they may be returned to the families is a high priority (Hershiser and Quarentelli, 1979).

The second generalization is that victim management activities are, by and large, a role undertaken by official response personnel such as law enforcement, firefighters, emergency medical personnel, and trained search and rescue teams. Neither of these generalizations explains very well what occurred after the September 11th disaster in New York City. Owing to the nature of this particular disaster, the identification of victims and the retrieval of human remains took place over several months. Indeed, some of these activities are still taking place more than one year after the event.

The mechanisms for generating and disseminating information about the identity of victims also were different in this case when compared to most disasters. In the immediate aftermath of the collapse of the World Trade Center towers, official administrative channels with primary responsibility for disaster response were overwhelmed (or in some cases, destroyed in the collapse). In the short term, a loosely coordinated network formed around the efforts of family, friends, co-workers, and non-governmental organizations, as well as official responders, and included the use of relatively new technologies such as patient locator sites on the World Wide Web to help identify the location of missing persons. In addition, family members produced and distributed homemade posters and flyers—most including pictures of the missing and the location where they were last seen—that

were attached to the walls outside of hospitals and other publicly accessible locations.

Over time, as hope gave way to resignation that those still missing were most likely fatalities, another set of processes involving DNA testing and other forensic techniques was established with the intent of identifying the remains of as many victims as possible. This task has proven to be daunting. The force of the initial explosion and subsequent collapse, coupled with the searing heat of the fires fed by massive amounts of jet fuel, has made locating missing persons and identifying the human remains extremely difficult.

Counting the Missing

The images of the towers collapsing were horrific, but it was impossible to know how great was the loss of life. The media pressed for numbers, and immediate estimates were in the thousands, some as high as 10,000. These reports were based solely on estimates of the working population of the two towers, the shopping mall below grade, and the collapse of and damage to the other buildings in the complex.

As more information became available, the numbers came down but still fluctuated. Two days after the event the number was 4,947. Two weeks later it had climbed to 6,566. Table 1 shows the frequent fluctuation of “official” missing as reported by the *New York Times*. This table, and the time frame indicated, illustrate the variance in the number of victims, and show how it can change rapidly as officials try to gain more accurate data.

With over 90% of the death certificates issued, the number has stabilized at around 2,825 (Lipton, 2002). Estimates of the number of people in the buildings when the planes struck indicate that approximately 95% of the twin tower occupants were able to evacuate (Kugler, 2001).

The fluctuating “missing” count can be explained by several conditions. First, the media typically press for the numbers of dead and injured so that they can report a “count.” Second, the manager of the official list was the Internal Affairs Bureau of the New York Police Department, which took all reports from all sources (embassy lists, company rosters, and all missing persons reports) and compiled them into a single list. Accepting all missing persons reports at face value no doubt inflated the list. The Police Department dedicated resources to cull the list and eliminate redundancies, but it took time to investigate each report. More than 200 officers were assigned to investigate the missing persons claims. With respect to the official list, Deputy Police Commissioner Antenen stated, “Our goal is not to be fast; it is to be accurate” (Lipton, 2001, p. B-1). Third, some initial assumptions were made about the number of potential casualties of visitors to the buildings who did not normally work there. A later analysis of the death certificates shows that 98% of the victims were at work when the collapse took place (Lipton, 2002).

Table 1. Fatalities and casualties after the collapse of the World Trade Center (selected dates).

Date	Total Missing Persons	Confirmed Dead	Missing & Dead	Bodies Identified
Sept 13	4,763	184	4,947	34
Sept 17	4,957	190	5,147	39
Sept 20	6,333	233	6,566	n.a.
Sept 24	6,453	261	6,714	188
Sept 27	5,960	305	6,265	238
Oct 1	5,219	314	5,533	255
Oct 3	5,219	363	5,582	289
Oct 6	4,974	380	5,354	321
Oct 9	4,815	422	5,237	370
Oct 12	4,715	442	5,157	385
Oct 15	4,688	453	5,141	398
Oct 18	4,404	456	4,860	404
Oct 21	4,313	461	4,774	411
Oct 24	4,129	478	4,607	425
Oct 27	3,958	506	4,464	454

Source: *New York Times*

Note: The number of confirmed dead includes 157 passengers aboard the two airliners.

Waiting for the Missing

Four minutes after the first plane hit, the Greater New York Hospital Association (representing 40 area hospitals) had initiated its emergency call-down system to alert area trauma centers to prepare for incoming casualties. This is a normal and practiced procedure used for multiple casualty incidents. Hundreds of living victims (the walking wounded) were treated throughout the area, the so-called “first wave” of casualties. The first wave did not overload the system. The anticipated second wave, one that would normally include those more seriously injured and could possibly overwhelm available resources, never came.

Looking for the Missing

The chaos of evacuating thousands of people, and the high number of those unaccounted for, as well as the real-time coverage of the event, meant that

everyone with a connection to a loved one in those buildings wanted information. Phone systems were down, an entire area code serviced by equipment on the towers was gone. Two systems evolved to deal with the trial of locating information about victims, one high tech, and the other low tech.

The high-tech solution went on-line 72 hours after the incident. The Greater New York Hospital Association set up a web page called the “Patient Locator Service.” Anyone with access to the internet could enter a name and if that person was being treated at an area hospital, the hospital name would be returned. Though not highly publicized, the site received over 700,000 “hits” in the next three days, and in a week’s time had received 1.2 million hits (Figure 1). Several web sites also hosted “virtual” missing posters, in which a scanned photo and basic information about where that person was last seen was available on-line. These sites were hosted by CNN and other news carriers, and some were privately hosted. Relatives or friends could upload their information directly to the sites.

The low-tech approach was something that is more commonly seen with kidnappings or abductions: a missing persons poster was created that had a picture of the person; a list of distinguishing clothes, features, or other

**WORLD TRADE CENTER VICTIMS
WHO WERE TAKEN TO AREA HOSPITALS**
Please enter the first and last name of the person you are searching for

The information contained in this Web site has been provided by hospitals in the New York-New Jersey metropolitan area to the New York City Mayor's Office of Emergency Management (OEM) for the purpose of identifying those individuals who have been seen in area emergency departments in connection with the recent terrorist attack on the World Trade Center. The information is being provided to facilitate the location of individuals affected by the disaster. Attempts are being made to update the information at regular intervals. Given the disaster circumstances under which the information is being provided, neither the hospitals, OEM, nor Greater New York Hospital Association, which helped create the Web site, have had the opportunity to take steps to independently validate the information and are not responsible for any inaccuracies, misspellings of names, or incomplete information.

World Trade Center Victims Who Were Taken to Area Hospitals

Last Name:

First Name:

This site provides information about patients who have been seen by New York-New Jersey area hospitals. If you would like to report a missing person, you can call the Missing Persons Hotline at (866) 855-4167.

For more information, please visit www.nyc.gov.

Figure 1. Screen shot of the on-line patient locator service.

identifying information; where he or she worked; and similar data. Vendors would offer assistance with scanning and in some instances making free copies for those wishing to make flyers.

The flyers were posted at hospitals, subway stops, and on construction barriers at the assistance centers. Outside of Bellevue Hospital, a construction partition outside of the main entrance quickly became covered with flyers. As hope faded, the posters took on a second function—that of a memorial remembrance. Soon the partition became a place of mourning and became known as the “Wall of Prayers” (Figures 2 and 3).

Identifying the Missing

After two weeks it was clear that reducing the number of missing would only come about through forensic identification of the human remains found in the 1.8 million tons of debris. This proved to be a daunting task, and one that has yet to be completed over a year after the event. The crush of tons of debris meant that very few bodies were found to be “whole.” In fact, only 293



Figure 2. One view of the “Wall of Prayers.”
[photo by Stephen Stehr, 2001]



Figure 3. Second view of the “Wall of Prayers.”
[photo by Stephen Stehr, 2001]

“nearly” whole bodies were recovered. The only means left of reliably identifying the missing would be through DNA testing of the remains.

The process of recovering the remains took place in several steps. While excavation was taking place at Ground Zero, on-site “spotters” would call a halt to backhoe operations if suspected remains were seen. Just before the debris left the site, it was given a second look to locate remains. The debris was then transported to the specially designated landfill where examiners on either side of a conveyor belt examined the debris for personal effects and any potential remains.

Once an “official sample” was identified at any of these locations, it was transported to the morgue where a forensic anthropologist (Medical Examiner’s Office, Department of Forensic Biology) would determine whether the sample was actually human. Because of several restaurants in the complex, there were samples of chicken and hot dogs initially identified as human remains. If determined to be human, the sample then went to the temporary morgue set up by the Disaster Mortuary Response Team.

Once in the Disaster Mortuary Response Team system, the sample would be matched to one of three sources to help identify an existing tissue sample

(most reliable in terms of match); a DNA match to the victim's possessions (hairbrush, toothbrush, etc); or a DNA match to a sample from a relative.

Over 20,000 individual remains have been recovered. Identification has been difficult for a number of reasons. For example, some samples are not testable because they are too pulverized. Other samples are too burned to yield good results. Because untrained forensic personnel were involved in the chain of custody, there were complications from inaccurate labeling, missing data, or similar mistakes.

The first round of DNA testing found useable results on only half of the samples. Typical DNA testing uses 400 base pairs, and requires a certain quantity of sample. Because of the poor quality of the samples, and in some cases the small amount of material available for testing, the 400-pair test produced results in approximately 10,000 out of 20,000 samples. The testing procedure has moved to more complex technology. A more advanced testing procedure can get results using a smaller sample size, and obtains results using just 100 base pairs. The procedure is more complex, more expensive, and takes more time. For those samples that can be tested, the 100-pair test is the next step in the process.

The Medical Examiner's Office has identified 1,102 of the missing and anticipates that the number eventually will reach 2,000, but that this will take up to two years after the event. It is anticipated that 800 of the missing may not be identifiable for whatever reason. The Medical Examiner's Office intends to store the samples indefinitely, with the hope that as technology advances the remaining samples can be identified (Emling, 2002).

Conclusion

The events of September 11th and the initial observations of the response efforts have demonstrated that a number of new elements must now be included in disaster preparedness and response plans. First, city emergency planners must be prepared to think and plan for what were previously unthinkable events involving thousands of victims. While the Office of Emergency Management in New York City had planned for the possibility of a small plane hitting a high rise in the city, it had not considered the possibility that two wide-body airliners would be flown into the twin towers.

Second, emergency planners also need to anticipate and create logistical mechanisms for dealing with large numbers of casualties and fatalities. As the September 11th disaster demonstrated, major population centers should be prepared to produce and distribute accurate information to victims' families through web sites and patient locator systems that can be created in advance and activated immediately after catastrophic events. As we have seen, victim identification and patient locator services are vital to the interests of the victim's loved ones and, if utilized effectively, may reduce the burden on

public officials. However, while technology can greatly assist in victim identification processes, the public must be aware that these mechanisms cannot completely solve the information-based problems associated with large numbers of victims.

Third, planning and emergency drills and simulations need to address the possibility of larger-scale incidents and how they might be dealt with in terms of information management and communication. Responder education and training that explicitly plans for mass casualty events should become part of all emergency planning.

Future Research

Finally, there are several recommendations that can be made regarding the need for future research. First, there needs to be additional research into how to manage large numbers of victims, from patient information to the process of DNA collection and matching. Second, there are a variety of ways in which the World Wide Web could be utilized in the immediate aftermath of a large-scale disaster, but little research has been performed to determine how best to utilize this as a resource. Lastly, there would be a benefit to additional research that explores how the definition of victim and victim assistance has changed, and how that then affects policy development and policymaking.

Notes

1. We are adapting a term used by the New York Office of the Medical Examiner in which they referred to this incident as a “mega-fatality incident” in a presentation at the 2002 National Disaster Medical System Conference, April 2002. (Office of the Chief Medical Examiner, 2002).

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