UNIVERSITY DISASTER PREPAREDNESS: A NETWORK APPROACH

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The present research used a network approach to examine critical emergency response networks in a university community. The research identified the organizations of three different sectors of response efforts to disasters (Public Health, Public Safety, and Communication), how resources have been utilized by network organizations in the past, and how these network organizations may communicate with each other during times of disaster. Individual semi-structured interviews were conducted with key informants from 30 unit to assess each unit’s previous disaster response experience, their formal and informal contacts within the university community, and their perceived capacity for response to potential future disasters of varying severity. Interconnections among units were determined through a network analysis to provide a picture of existing ties. The results of the network analysis suggest that, in every sector of disaster response, networks could be strengthened by formal recognition of centralized organization for response efforts, increased connectedness between organizations, and coordination of services. Network analysis is a valuable tool for determining the structure of response systems in a university setting.
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INTRODUCTION

The total number of disasters worldwide has grown over the last thirty years, from a reported number of below 100 prior to the 1970’s to a high of approximately 400 in the 1990’s (Bissell, Pinet, Nelson, & Levy, 2004). In the last 25 years in the United States alone, there have been 442 natural disasters and 902 disaster declarations (Bissell, et al., 2004). In the last century the top ten natural disasters in the United States have killed 16,500 people and adversely affected 2,390,000 people. These figures do not take into account the number of people affected by human-caused accidents and terrorism (EM-DAT: The OFDA/CRED International Disaster Database, as cited in Bissell, et al., 2004).

One devastating disaster that affected the United States in recent years is Hurricane Katrina. On August 29, 2005 Hurricane Katrina slammed into the Gulf Coast as a category 5 hurricane with wind speeds reaching approximately 140 mph (Kauner, 2005). Widespread damage occurred as a result of the storm, with the most visible and extreme damage to New Orleans, where the city’s levees had been breached and water flooded 80% of the city (Knauer, 2005). As a result of this one incident alone, thousands of people were displaced, countless homes and businesses were destroyed, and many people lost their lives. Universities in New Orleans faced numerous difficulties, including extensive damages to campus facilities, a lack of funding to make necessary repairs, and inadequate student enrollment after most schools reopened only five months after the disaster (Fletcher, 2006).

Less than two years later, on April 16, 2007, Virginia Polytechnic Institute and State University (Virginia Tech) was the site of the largest school shooting in United States history when Seung-Hui Cho, a student at the University, took the lives of 32 students and faculty and wounded 25 more before ending his own life (Virginia Tech Review Panel: Mass shootings at
Virginia Tech - Report of the Review Panel, 2007). This incident raised many questions regarding the University’s preventative actions before the incident, for example, regarding campus security and communications, and the response efforts of the University in the aftermath, for example, regarding the effectiveness of response to the incidents (Virginia Tech Review Panel: Mass shootings at Virginia Tech - Report of the Review Panel, 2007). The impact of these two incidents, as well as others, have helped to highlight the necessity of comprehensive disaster planning efforts for colleges and universities around the country.

The present study uses a social network approach to examine disaster preparedness at a university in northwestern Ohio. Key informants in campus units and organizations responsible for public health, public safety, and communication at the university were interviewed to examine the structure of each sector in past campus emergencies, informants’ expectations about their organizations performance in two hypothetical disaster situations, and other opinions related to campus disaster response. A review on relevant literature concerning the impact of disasters and the usefulness of network analysis as a tool for increasing disaster preparedness provides a framework for the present research.
LITERATURE REVIEW

Impact of disasters

Many different aspects of the emergency response effort became important in the days and weeks following the incidents at Virginia Tech (Virginia Tech Review Panel: Mass shootings at Virginia Tech - Report of the Review Panel, 2007). Victims and their families needed support, assistance, and information from both the University and governmental agencies. Services for individuals who had an increased risk for experiencing post-traumatic stress were provided to victims and first responders to the scene. Ceremonies and memorial events were planned by the university, campus organizations, and students for the victims, families, students, and the larger community. Public information and the presence of the media after the events were also issues that had to be dealt with.

During the aftermath of Hurricane Katrina, it became evident that most of the injured and deceased were individuals who were ethnic minorities, the elderly, and those of low socioeconomic status (Knauer, 2005). Most of these people did not have the means to evacuate the city; the people who were left were the people that government safety nets are designed to catch (Knauer, 2005). Sadly, these facts are consistent with Bissell et. al.’s prediction that “the combination of high-density living and the vulnerability that coincides with poverty will result in world levels of population exposed to disaster risk not seen in recent history” (2004, p 194). Furthermore, it has been noted that individuals of a low socioeconomic status have additional issues that may aggravate the effect of a disaster, such as living in poorly constructed dwellings, less insurance protection, and less access to relief resources (Zakour, 1996).

In the mental health area, the impacts of disasters have been studied in many different populations, including children and women, as well as the impact of different types of disasters, such as technological and natural disasters (e.g., Gaffney, 2006; Galambos, 2005; Markstrom &
Charley, 2003; Pulcino, et al., 2003). The National Center for PTSD, a part of the U.S. Department of Veterans Affairs, cites various emotional, cognitive, physical, and interpersonal effects of trauma (National Center for PTSD). Some of the shifts commonly seen are physiological changes such as cardiovascular changes and sensory flashbacks, cognitive changes, including memory problems and difficulty in decision-making, behavioral changes such as sleep disturbance, withdrawal, and eating problems and emotional changes such as anxiety and hypervigilance. Phenomenological changes have been reported, such as integrating this new experience into everyday life and trying to find meaning in the experience (Steinberg, 2002). Some less common symptoms are considered indicative of a severe response that will require psychological services, such as dissociation, intrusive re-experiencing of the event, extreme avoidance, and hyper-arousal, among others. It is generally assumed that after exposure to a traumatic event, most people will have some level of distress usually for a period of several weeks.

It is a misconception that only individuals who directly experience a traumatic event can have traumatic reaction; there are differing levels of victims in a disaster, according to Steinberg (2002). Primary victims include people who directly experience or witness the disaster event. Secondary victims are those who are near the disaster site during a disaster, or work in or near disaster cites. Finally, tertiary victims are those who are affected by the event through another person, i.e., a family member of someone who is a rescue worker, or a colleague of a person who is injured at the disaster. The larger community, suffering economic or other losses as a result, is also a victim of the event. Any of these groups can experience symptoms as described above.

Disaster Planning

At what point does an incident become a crisis or disaster? According to the Department
of Homeland Security’s (DHS) National Response Plan (December, 2004), a major disaster is “any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States” (Department of Homeland Security, www.dhs.gov). The definition of a disaster, according to the Emergency Disaster Database is a “situation or event, which overwhels local capacity, necessitating a request to national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering.” This definition goes on to suggest that disasters can be caused by nature or by humans and gives examples of each, including wars and civil disturbances (EM-DAT: The OFDA/CRED International Disaster Database).

How can communities and organizations prepare themselves for such unpredictable events? Generally, prevention and preparedness are the two terms most commonly used when thinking of disaster planning. Prevention of emergency events is the easiest to define: the goal is to keep the event from happening (Bissell, et. al., 2004). Activities specific to prevention include decreasing community vulnerability, developing response plans to problems that might lead to a disaster, and providing training and response equipment prior to the onset of a hazardous event. Preparedness assumes disasters will occur but that negative consequences that usually accompany them can be reduced. The DHS definition for preparedness views preparedness as “the range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents” (www.dhs.gov).

The definition of preparedness seems to underline the importance of a disaster plan in
helping to disseminate response information. In developing a response plan, it is first necessary to identify threats, risks, and vulnerabilities that should be included in the disaster plan and then to complete a risk assessment to determine the level of risk that each threat poses (Clifford, 2004). The disaster plan should recommend, in clear and easy to follow writing, the procedures required, including when it is to be used, how it is to be implemented, and the roles and responsibilities of people designated to carry it out.

Following the incident at Virginia Tech, President George W. Bush commissioned a committee to meet with leaders across the nation to learn about broader issues that were raised by the tragedy. In their report, emergency planning and preparedness was one of the key areas in which changes could be made (Report to the President on Issues Raised by the Virginia Tech Tragedy, 2007). A variety of concerns were delineated, including the problem of producing a disaster plan that prepares for evolving threats to public safety, a lack of dissemination of “best practices” in planning efforts, and the difficulty of adapting plans already in place in the K-12 educational settings to higher education. Concerns in planning that were unique to colleges and universities included difficulty in planning due to the age of students, the number of individuals on campus, and the size of the institutions. Campus law enforcement cited problems in understaffing, training, and resources, and some institutions believed that their campus police’s status as law enforcement officers was questioned by students, campus officials, and external law enforcement officers. Further, more general concerns with plans themselves were issues involving a lack of assurance that plans would be used and be effective, a need for practicing the plan, continuous and ongoing dissemination of the plan especially in light of the high rate of student turnover, and using new technologies for communication which may cause challenges in establishing and maintaining these systems. Finally, the report addressed the importance of
appropriate response to victims, including long-term mental health services, sensitivity of the needs of the local community, and the importance of learning from tragedies to formulate and implement plans based on lessons learned.

Social Network Analysis

Network analysis has been used as a tool in facilitating disaster preparedness. Network analysis is a set of techniques that are employed to systematically analyze a social structure in a relational way (Degenne & Forse, 2004, as cited in Luke, 2005). Network analysis lends itself to many different questions related to disaster preparedness. Areas that have been studied using this method include the network that delivers services during an emergency, the influence of outside factors on emergency response organizations, and the way in which individuals make sense out of their experiences after a disaster (Gillespie & Murty, 1994; Reiser & Muncer, 2004; Topper & Carley, 1999; Zakour, 1996). Out of the context of disasters, network analysis has been used for general social organization, for example, examining within cities the flow of money, information, and resources (Galaskiewicz, 1979).

Studies that directly assess a network’s response during a disaster have been helpful in determining the network structure, including helping to identify the organizations that participated in the response efforts and the ways in which these organizations participated. Topper and Carley (1999) used a network approach to analyze the organizational system after the Exxon Valdez oil spill and compared their findings to organizational theory. The network in this research developed in response to this disaster and was described as consisting of many units that came together to provide a coordinated response plan. Topper and Carley stressed the evolving nature of the network, particularly because response plans that take into account key events that could occur during a disaster, such as damage to particular areas of a location, are difficult to
design. Another strength of Topper and Carley’s research was its ability to focus on the activity of organizations that were local to the disaster area. They determined that it is important to involve local organizations in response efforts because of these organization’s ability to provide unique services and because they can play an important role in directing additional resources from larger organizations.

Network analysis has several limitations. Network analysis requires the inclusion of representatives of every organization in the network under investigation. In other words, the research requires a 100% response rate from participants so that information about each organization identified in the network is represented. Topper and Carley (1999) also note the special problems network analysis can introduce to understanding the data. For example, the network treats all organizations as complete identities, without allowing for the possibility that departments within an organization may work separately or differently. In addition, network analysis does not allow for measures of the effectiveness of an individual organization; therefore, organizations that are not functioning properly within a system may not be identified within the whole of the system (Topper & Carley, 1999). Network analysis is also limited in its ability to account for the way in which system patterns emerged or to account for external constraints placed on a system, including funding requirements, the community power structure, and rules, regulations and laws imposed on it (Tausig, 2002).

Psychologists have been successful in the use of network analysis to study post disaster service delivery. Gillespie and Murty (1994) used this method to determine the location of problems in an emergency response system prior to the occurrence of an event. This research was conducted on an interorganizational network in which specific problems relating to an event were focused on by examining all the relations between organizations that respond to events
together. This helps in several different ways, including making services more accessible, reducing the duplication of services, and preventing or eliminating cracks in service delivery.

Reducing cracks in the delivery of services during an emergency is an important strength of utilizing network analysis. Tausig, in his network analysis on service networks, identified three types of “cracks” that can be found in a system (Tausig, 1987, as cited in Gillespie & Murty, 1994). A crack, according to Tausig, is “a catchall representing missing services, inaccessible services, administrative oversight, inappropriate referrals, and missing information (Tausig, 1987, p 340, as cited in Gillespie & Murty, 1994). Type 1 cracks describe relationships between organizations in a network that do not follow a set pattern. This indicates a lack of consistency of procedures in the network resulting in unreliable and nonsystematic links. The second type, a Type 2 crack, is defined by an absence of relationships between sectors of the system. These types of problems would be evident in areas that you would expect or would like linkages to exist, but they do not. Type 3 cracks are linkages that are conflicted or are unsatisfactory. This would appear as a linkage as any other but might be discovered upon further investigation of the system. For example, a Type 3 crack may become evident through complaints by individuals who use the system regularly.

Gillespie and Murty furthered this distinction by focusing on poor linkage cracks, stating that there are two types of linkage cracks that can exist within a service network; the first is defined by the existence of isolates, or organizations with no interaction at all with the rest of the network (Gillespie & Murty, 1994). This type of crack, known as a type A crack, is seen as the more severe type because it prohibits communication between these isolated organizations and the rest of the response network. The second type of crack, a type B crack, is defined by poor linkage between organizations. For example, when a cluster of organizations is connected to a
network only by a series of long and indirect links, problems can occur. Either of these types of cracks can result in problems in the service delivery of the network; however, in the presence of a disaster, these problems become magnified. Disasters affect the service delivery of a network by imposing demands exceeding normal operating capacity of organizations within the system. This creates interdependence among service organizations that may not have existed prior to the disaster situation. It can also produce conflict between service organizations because of reduced resources or because of a high demand of resources by all organizations at once (Gillespie and Murty, 1994).

*Network Analysis Procedures*

The procedures most often used when utilizing network analysis are similar across many studies. First, the organizations that make up a particular network are identified, usually using multiple methods, such as talking with individuals who are a part of the network or asking key informants to suggest organizations. Next, organizational leaders or key informants from each organization are identified and contacted for data collection. Once data collection is complete, the patterns of contact described by the participants are then transformed into a matrix of organizations so data about the network can be analyzed. In nearly all cases, this includes measures of the network’s density and the centrality of organizations within the system. Cracks and poor linkages are also identified, as well as other variables useful to the study. Table 1 describes some basic elements of a network approach, with descriptions of how some of the concepts are calculated.

One excellent example of this process was completed by Gillespie and Murty in their study of service delivery of disaster response organizations using vignettes to simulate varying magnitudes of disasters (1994). The researchers contacted all of the organizations they believed
might be involved in response efforts in one city and questioned officials on interorganizational relations, organizational characteristics, and the participation of other organizations in the city that might respond to a disaster. Finally, a questionnaire was sent to these officials, which contained a vignette involving an earthquake situation. Participants were asked to 1) describe how their organization might respond 18 hours after the event, 2) list up to 10 organizations they would contact in responding to the earthquake, 3) estimate the number of times in the last 3 years that the organization responded to any of seven specific types of disasters, and 4) rate on a 10 point scale the capacity of the organization to provide evacuation services, immediate care, and counseling services. Following this extensive data collection, Gillespie and Murty divided the network into subgroups and created a matrix of the organizations to find density relations, or the ratio of actual relations to the total number of possible relations, which can be used as a measure of overall level of coordination between organizations in the network (Topper & Carley, 1999). Isolates and poor linkages, including both types of poor linkage cracks that they had identified, were found within the system.

As we have seen in the above examples, network analysis gives researchers a unique way to examine links of organizations as a complete structure. To examine the linkages more closely, Topper and Carley (1999) list a number of ways to statistically calculate relationships in the network. The number of nodes in the network are represented as the number of organizations that participated in any given time to response efforts (Topper & Carley, 1999). Isolates are calculated as the number of participating organizations that did not have ties with at least one other organization. Network density is determined by dividing the number of ties between participating organizations by the number of possible ties in the network. Other scores that are sometimes calculated include connectivity, graph efficiency, and betweenness centralization.
Zakour (1996) computed the probability that any organization will have a link with another organization by dividing summary scores, or the sum of all the link scores for each organization, by the total number of organizations in the network.

Important Disaster Systems

In his analysis of the literature concerning disaster research, Dynes (as cited in Drabek, 1986) found six distinct organizational systems that were important. These were local emergency management-civil defense, hospital-medical, first responders, mental health agencies, media organizations, and schools. The campus community being focused on in the present research has four of these six systems. There are a variety of organizations on campus that contribute to the health of students, the safety and security of the campus, media relations, and the mental health of students. Previous research has focused on the mental health response on this campus and is therefore not necessary to cover in this research (see Stein, Vickio, Fogo, and Abraham, 2007). Therefore, the three networks that will be focused on in the present research include the Public Safety network, which could serve as first responders in an emergency, the Public Health network, which may serve as first responders and may experience an increase in the demand for services, and the Communications network, which will be important to keep students and the community informed as well as assisting in communication efforts. Previous studies in each of these three networks are described below.

The Public Health Sector

The force of Hurricane Katrina took the public health response network by surprise. Because of other problems in the city, much-needed supplies were unable to reach residents who were trapped in the city (Kauner, 2005). Many New Orleans hospitals were unable to evacuate, trapping patients, residents, and health care workers for days. Additionally, many hospitals ran
out of fuel for the generators and found themselves without clean water to keep conditions sterile, using hand sanitizer as an alternative. Hospitals began to be evacuated four days after the hurricane and all hospitals were declared evacuated a week after the storm. These problems made it much more difficult for the public health sector to provide services at the level of care that was necessary. Additional preparedness may have allowed the public health sector to deal with these challenges more easily.

In contrast to the problems seen in New Orleans, due to the fast and efficient EMS response, many lives were saved at Virginia Tech. However, although the EMS response was a typical one in which responders usually followed the procedures, problems were seen even in this response. The large number of victims on the scene made it vital that EMS responders work fast to identify those who needed the most urgent medical attention. Due to this pressure, some EMS responders neglected to use triage ribbons or tags consistently, which are used to assist with record keeping and patient follow-up (Virginia Tech Review Panel: Mass shootings at Virginia Tech - Report of the Review Panel, 2007). As a result, there was increased confusion in patient identification and classification upon arrival at the hospital. At area hospitals, a major concern was a lack of information regarding the number of victims they should expect to receive, due to an inability to determine the extent of the incident immediately following the shootings. The hospitals also attempted to provide assistance in locating victims for their families and friends but had difficulty finding information for them, despite the existence of a web-based hospital emergency operations center designed to assist with these problems.

Activities involved in preparedness for the public health sector typically include response planning, personnel training, procurement of equipment and stockpiling of supplies with the requisite training, surge capacity enhancement, back-up systems or supplies and power, and the
development of resilient and effective communications modalities (Bissell, et. al., 2004). It is
evident that the public health sector’s response to disaster goes far beyond injury and illness
prevention immediately following a disaster.

It has been seen in the past that most public health organizations in the United States do
not involve themselves in emergency training, with the exception of the few that are mandated to
have response plans, including hospitals and community emergency medical services (Bissell, et.
al., 2004). In response planning, collaboration between public health organizations is seen as key
to providing adequate response services following a terrorist attack (Glick, Jerome-D’Emilia,
Nolan, & Burke, 2004). As a result, public-private partnerships have been formed which
included emergency response personnel (including police and fire departments), public health
and hospital personnel, laboratory and pharmacy resources, mental health support, and
community volunteers (Glick, et. al, 2004). These areas were chosen out of a belief of the
importance in including personal, professional, and community knowledge in response plans. It
was also important that plans, procedures, and policies cover a wide variety of possible
emergency scenarios.

Local public health districts have been responsible for writing emergency operation plans
and have been viewed as an emergency response system (Glick, et. al. 2004). The public health
sector created a Hospital Emergency Incident Command System (HEICS) to aid in defining roles
and responsibilities and instituting a common language between agencies. In addition, the
creation of this central command hub allows for the continued functioning of the facility through
use of the phone, Internet, and two-way communication devices. Also, a safe and responsible
response level can be ensured by appropriate parties through use of the HEICS. The HEICS also
manages the efforts of personnel by assigning and directing staff that may come in or be called in
to aid in the care of patients. In this way, personnel are assigned to areas that need the most assistance and can be moved from one area to another as needs shift.

*The Public Safety Sector*

In the aftermath of Hurricane Katrina, the resulting breakdown in public safety was attributed to the estimated one-third of New Orleans Police Officers that fled the city in the days after the hurricane (Kauner, 2005). Other estimates, believed to be more accurate, state that one-sixth of the city’s police force did not report for duty in the days immediately following the disaster, a figure which translates into about 249 officers (Kauner, 2005). Additionally, National Guard troops, dispatched to supply food and water as well as keep peace at the shelter areas, such as the Superdome and the Convention Center, were undersupplied and overwhelmed by the numbers of people at the sites, which continued to grow in the days following the disaster. Later attempts to evacuate these sites by bus were unsuccessful due to rioting and reports of snipers shooting at rescuers. A week after the hurricane struck, both arsonists and looters continued to wreak havoc on the city, even after a call of “zero-tolerance” for lawbreakers by President Bush. In response to the ongoing lack of protection, some residents who stayed behind protected their property by arming themselves with guns. It is evident that police and other public safety officials were among some of the most taxed during the aftermath of this hurricane. However, pre-disaster training and emergency preparedness measures may have prevented some of these issues and made the situation somewhat easier to respond to.

Although the police response to the incidents at Virginia Tech was generally excellent in that they responded professionally and followed police policies, there have been some criticisms from both the public and the review panel (Virginia Tech Review Panel: Mass shootings at Virginia Tech - Report of the Review Panel, 2007). One of the biggest criticisms has been the
response of police to the first incident at the University, during which two students were shot at a
dormitory on campus. Critics have suggested that police made incorrect assumptions concerning
who the possible perpetrator was and that they communicated to the University administration
that the suspect was probably no longer on campus. Partly as a result, notifications to university
students were not made in a timely manner. After the second event, the mass shooting at Norris
Hall, police again responded quickly and in accordance to police practices. There were questions
about the amount of time it took police to enter the building after their arrival, due to the locked
and chained doors.

Research has been done to identify problems that confront police in responding to an
emergency or disaster (Mathis, McKiddy, & Way, 1982). Interviews were conducted with
officers involved in the response to the Hyatt-Regency Hotel disaster in 1981, as well as other
disasters, to look for common problems. Some common problems in dealing with an emergency
include personnel management problems such as how and where the responding personnel are
assigned, who commands and supervises them, how officers from different commands and
agencies are brought together to work toward a unified response under the operations
commander, and who will coordinate efforts across agencies. Other concerns include what
records should be kept and who should keep them, who is responsible for foreseeing and
planning for future manpower and equipment needs that may arise, and what other procedures
may be modified as well as who is authorized to make those modifications (Mathis, McKiddy, &
Way, 1982).

More recently, Incident Command Centers have been employed to help manage
responses to disasters of larger proportions. This is usually necessary when agencies from
multiple jurisdictions respond to an incident, usually through mutual aid agreements (Conner,
This gives the operations a central command center at which many different tasks could be done. For example, ground and air ambulances can be directed, contact with the media can be made, the conditions of victims can be monitored, witness statements can be collected, and equipment can be accounted for (Conner, 1997). This system is beneficial for determining who has the ultimate control over the response efforts in addition to assisting in giving the responders a common emergency response language.

The Communications Sector

Communication, including both media and technology, is often one of the major problems that must be overcome during an emergency. For example, problems in communication were seen immediately following Hurricane Katrina. Land lines and cell phone towers had been knocked out by the storm, and because the power was out, it was impossible to recharge batteries for police and fire radios as well as cell phones; ham radio operators were suddenly essential to the communication structure (Knauer, 2005). In Bay St. Louis, Mississippi, only one local radio station was able to maintain functionality, and spent its airtime relating important information such as where food, gas, and shelter could be found, to residents who had no other means of obtaining this information (Knauer, 2005). In a broader sense, the communication structure failed in that many organizations were unclear as to their roles and responsibilities in the response efforts, although a disaster plan delineating this information did exist (Knauer, 2005). An additional problem, especially during and immediately after the hurricane, was that the news media was often reporting information that was distorted or untrue. Similarly, while the incidents at Virginia Tech were occurring, communication to students and faculty by university administration was consistently vague. This was primarily due to concerns about raising panic and attempts to reduce shock and fright at the University, but it has been suggested that specific,
as well as timely, communication to the campus may have saved lives (Virginia Tech Review Panel: Mass shootings at Virginia Tech - Report of the Review Panel, 2007).

At Virginia Tech, communications difficulties burdened police and medical response (Virginia Tech Review Panel: Mass shootings at Virginia Tech - Report of the Review Panel, 2007). For example, police had difficulties in communication between police inside and outside the building while evacuating students from Norris Hall. Police also had difficulty transmitting information about on-scene activity due to problems with cell phone reception. Additionally, there were communications problems seen in the emergency response of the EMS. The two major EMS response services, the Virginia Tech Rescue Squad (VTRS) and Blacksburg Volunteer Rescue Squad (BVRS) were not well coordinated, therefore, mistakes were made when making calls for units. As is usually the case, the rescue squads work on different frequencies, which can cause difficulties in coordination of squads. In this case, BVRS did not know where to stage their units. EMS established an incident command system that was useful in enhancing communications; however, there was some difficulty in notifying BVRS that an incident command system had been put into place. Communications were improved when the Montgomery County emergency services management coordinator arrived at the scene to serve as a liaison between the police tactical command post and the EMS command post.

Inconsistent and inadequate information can have several detrimental effects. For example, receiving information that is inconsistent from different sources or receiving information from unprepared or uninformed speakers can contribute to confusion, as well as anxiety, and possibly create fear (Wray, Kreuter, Jacobsen, Clements, & Evans, 2004). Good communication should be well planned and well executed. The goals should be to provide the audience with clear precautions, be reassuring, reduce distress, and help to limit unnecessary
demands on the healthcare system.
PRESENT STUDY

The present study examined the sectors of Communication, Public Safety, and Public Health on a Midwestern university campus to provide an overview of the structure of the university’s disaster response network. For our purposes, organizations were grouped into sectors (Communication, Public Safety, and Public Health) and then each was viewed as a larger response network for the university. In addition to mapping the overarching structure of each sector, the research determined the functions of the sector as a whole in past disaster situations as well as the expected functions of the sectors in two hypothetical disaster situations. Representatives from each organization within a sector completed a semi-structured interview that asked a variety of questions. Questions participants were asked included describing demographic data concerning the organization, the organization’s ability to provide a range of services, and the number and skill of individuals expected to respond to a disaster, including any specialized training of employees specific to disaster response. In addition, other items captured the organization’s past response to disaster, the expected response to two hypothetical disaster situations, and ways in which the provision of services during a disaster could be improved.

The research is descriptive in nature and focuses on identifying the structural characteristics of these three sectors that are important to disaster preparedness at the university and allow us to get a picture of the larger disaster response network. Using information provided by organizational key informants, the study examined the structure and characteristics of each network sector, the organizations’ participation in past disaster efforts and perceptions of each organization’s role in two hypothetical disaster situations. Linkages and lack of linkages between organizations are identified. In addition, each organization’s level of involvement in providing supplies and equipment, staff and personnel, and in assisting with the aftermath are reported.
METHOD

Participants

The present study was conducted at a mid-sized Midwestern university and focused on the organization of the Public Safety, Public Health, and Communication response sectors. The sample consisted of 30 key informants at each of 30 on-campus organizations or departments. These organizations were selected for inclusion in the study by virtue of their membership and participation in activities related to the purpose of one of the networks. Similar to previous research, inclusion into the network was decided by an organization’s ability, willingness, or goal to provide volunteer disaster relief services (Gillespie and Murty, 1991; as cited in Zakour, 1996). Included organizations were identified through several methods, including a website search of services provided at the University in each of these areas, using the university directory to identify additional organizations, and checking this list for completeness with the director of an on-campus organization that is often involved in disaster response provision but was not a part of these sectors. Many of the organizations that were reported as important in the response efforts at Virginia Tech were similar to the organizations included in this study. Key informants were identified and contacted for each of the 30 chosen organizations via an explanatory letter or email. To identify informants who would serve as participants in this study, a leader or director for each organization was contacted and asked to participate or recommend an individual from the organization knowledgeable about disaster response. Potential participants received a telephone call or email designed to determine each individual’s willingness to participate and schedule a one hour long semi-structured interview. Informants who were unwilling to participate were asked to recommend an alternate person for that organization who could be contacted to ensure that a representative from each organization in each network was
After most interviews were complete, it became apparent that two organizations were important for the Public Health sector and three organizations were important for the Communication sector that were not originally included in the research. Therefore, additional interviews were added to the Public Health sector to include the College of Nursing and the College of Health and Human Services. Similarly, additional interviews were added to the Communications sector to include Finance & Administration (including the Treasurer’s Office), Campus Activities, and the organization that creates the Monitor, a weekly electronic update distributed by Marketing and Communications that informs the campus community of important issues for BGSU. Adding organizations to two of the sectors made it important to seek additional information from organizations that had already been interviewed. Therefore, participants were sent an email asking relevant questions from the original questionnaire about their level of contact with these organizations. A response rate of 100% was received from participants.

Measure

Based on assessment instruments used in previous research, a semi-structured questionnaire was developed for each sector. This questionnaire was very similar for each of the three sectors, containing the same sections and many of the same questions but was necessarily altered to tailor some questions to each specific sector. The Disaster Response Network Assessment used in the present research was adapted from the Organizational Network Assessment Interview used by Stein et al (2007; see Appendix A for the complete interview protocols used in the present study). The Disaster Response Network Assessment used in the present research contains approximately thirty-five items and includes a combination of open-
ended questions as well as questions which ask participants to choose options from several lists and some Likert items.

The overall framework of the questionnaire is composed of five parts. The first part contains a brief introduction stating the purpose of the interview and collecting background information on each interviewer and his or her organization. This also includes a question asking informants to choose from a list of services that the organization might be able to provide during an emergency and a question that asks participants to describe the number of staff and their training, including trainings specific to managing disaster response. The second part of the questionnaire concerns the organization’s history of participation in past disasters. This includes organizations they have worked with in the past and types of services the organization provided. The third and fourth part of the interview provide two vignettes describing potential disasters and assess how the organization might respond. The final portion of the questionnaire asks some closing reflection questions about the state of disaster response on campus and the readiness of the organization.

The two vignettes used in the questionnaires are designed to be similar in all areas excluding the scope of the disaster and the number of people affected by it. The first describes a hostage situation at the University Library and the second details the effects of a tornado on campus. Vignettes have been useful in obtaining information about the way in which organizations will respond in an emergency because they allow us to gather information without having to wait for a disaster to occur (Gillespie & Murty, 1994). Cue cards were provided to the interviewee to assist in selecting types of services offered by the organization from a list of possible services, to give a reminder of other organizations in their network, and to give the respondents a reference when asked to infer how their organization might respond to a particular
vignette.

Procedure

Five interviewers for the present student were doctoral students in the clinical psychology department who were individually trained in conducting the Disaster Response Network Assessment interview. Each interviewer conducted a practice interview with the first author, who served as the trainer and as a mock participant. All interviews were conducted in participants’ offices and lasted approximately one hour. Each interview began with a brief introduction of the interviewer, a review of the purpose of the research, and an opportunity for the participant to ask any questions he or she had. Participants were also informed during the informed consent process that all interviews were tape-recorded for the purpose of facilitating the gathering of information and for future reference, if necessary. Following the interview, the interviewer was asked to transcribe a detailed summary of the participant’s responses to the questions
RESULTS

Organizations

The sample consisted of 30 key informants representing 30 on-campus organizations or units. The Public Health sector had eight organizations in the sector, the Public Safety department consisted of six organizations, and the Communication sector was the largest, with sixteen organizations or departments.

The eight organizations that constituted the Public Health sector on campus included Athletic Trainers, student trainers at the Student Recreation Center, the Student Health Service, the Wellness Center, Disability Services, the College of Nursing, the College of Health and Human Services, and the Public and Allied Heath Department. Eight key informants in the Public Health sector participated in this study. Fifty percent of the key informants were males and the mean age of the key informants was 58.57 (SD = 13.59). They worked in their positions for a mean of 6.43 years (SD = 7.92 years), and were part of the organization for a mean of 10.19 years (SD = 10.40).

Six key informants represented the six organizations that constituted the Public Safety sector on campus. Organizations in the Public Safety sector include Transportation and Parking, Environmental Health and Safety, Campus Facilities, Campus Police, the Criminal Justice Department, and Judicial Affairs (now known as Student Discipline). Sixty-seven percent of the key informants were males and the mean age of the key informants was 55.50 (SD = 5.13). Key informants in Public Safety worked in their positions for an average of 14.00 years (SD = 6.13 years), and were part of the organization for an average of 27.00 years (SD = 11.61).

There were a total of 16 key informants interviewed as representatives for the Communication sector. The organizations that are contained by this sector include Marketing
and Communications, Human Resources, Registration and Records, Student Affairs/Residence Life, academic deans and chairs, the Center for International Programs, the executive vice president, Academic Affairs, Information Technology, Student Publications, the Interpersonal Communications Department, the Department of Journalism, the Telecommunications Department, the Treasurer’s Office, the Office of Campus Activities, and the Monitor. Fifty-three percent of the key informants were males and participants were an average of 52.00 years old (SD = 7.90). Key informants in the Communication sector worked in their positions for an average of 9.10 years (SD = 7.23 years), and were part of the organization for an average of 14.17 years (SD = 9.29).

**Public Health Sector: History of Disaster Response**

Table 2 describes important network characteristics for the Public Health network sector in past disasters, the small scale disaster vignette, and the large scale disaster vignette. Figure 1 illustrates the organizations within the bounded Public Health sector that each organization reported having contact with in past campus disasters. Of the 8 organizations that were included in the bounded Public Health sector, 5 key informants indicated that their organization had some participation in past disaster response. Participants in this sector listed working with between 0 - 3 other organizations within the sector. Within the bounded network, the Student Health Service was the organization that most informants believed that their organization would be working with (N = 3). The Student Health Service was named by three other organizations, including Athletic Trainers, Wellness Connection, and Disability Services. In addition, the Student Health Service reported having worked with the largest number of organizations in the past (N = 4). Three organizations (Public and Allied Heath Department, College of Nursing, and College of Health and Human Services) reported that they had either not participated in past disaster
response, or had not worked with other organizations during their response efforts.

There were a total of nine dyadic links between the eight organizations in this sector. There were two bidirectional ties in which Athletic Trainers and the Wellness connection both indicated that they had worked with each other in the past, and Athletic Trainers and the Student Health Service also indicated that they had worked with each other. The overall density of the sector is 0.3214 (SD = 0.4518). One organization was an isolate in this sector because it did not report working with other organizations in past campus disasters and no other organization reported working with it.

A number of organizations also indicated that they had worked with organizations outside the bounded Public Health sector in past campus disasters. Athletic Trainers indicated that they had worked with the most off-campus organizations (N = 5). The Student Health Service, the most central organization of the Public Health sector, indicated that they had worked with two organizations outside of the bounded Public Health sector in past disasters. All of the organizations that had responded to past disasters stated that they had worked with at least one organization outside of the bounded Public Health sector in their response efforts.

Organizations differed in their level of involvement in past disasters. Table 5 summarizes the level of involvement of each sector according to key informants’ reports. Of the Public Health sector organizations that had some history of past disaster response, most representatives of organizations reported that they either “strongly agreed” or “agreed” that their organization played a major role in providing the total number of supplies and equipment (60%, N = 3), “strongly agreed” or “agreed” that their organization played a major role in providing needed staff and personnel in past disasters (80%, N = 4), and “strongly agreed” or “agreed” that their organization played a major role in assisting with the aftermath or post-disaster activities (100%,
N = 5). Only one organization, the Student Health Service, strongly agreed that they played a major role in providing the supplies, staff, and assisting with the aftermath across all of the disasters in which they had been involved.

*Public Health Sector: Hostage Situation Vignette*

Figure 2 illustrates the organizations within the Public Health sector that each organization reported that they would probably be working with in a hypothetical disaster situation involving a hostage situation on campus. Five of the 8 participants in this sector stated that their organization would work with between 3 - 5 other organizations within the bounded network while 3 participants stated that their organization would not work with any other organizations within the sector. Within the bounded network, the Student Health Service and Disability Services were the organizations that most informants believed their organization would be working with (N = 4). In addition, the Student Health Service reported that it would work with the largest number of organizations in a situation such as this (N = 5). Three organizations (Public and Allied Heath Department, Disability Services, and the Wellness Connection) reported that they probably would not work with other organizations within the bounded network in a situation such as the hostage situation.

There were a total of sixteen dyadic links between the 8 organizations in this sector. As can be seen in Figure 2, there were two bidirectional ties in which Athletic Trainers and the Student Health Service both indicated that they would probably work with each other in a situation such as this, and the Rec Center staff in Fitwell and the Student Health Service also indicated that they would probably work with each other. The overall density of the sector is 0.5714 (SD = 0.4518). There were no organizational isolates in this sector. However, as noted above, three organizations indicated that they would probably not be working with other
Six of the 8 bounded Public Health organizations also indicated that they would probably be working with boundary spanning organizations, or those organizations outside the bounded Public Health sector, in this hostage situation. The Public and Allied Heath Department indicated that they would probably be working with the most off-campus organizations (N = 4). The Student Health Service indicated that they would likely be working with 1 organization outside of the bounded Public Health sector while Disability Services indicated that they would likely be working with 2 organizations outside of the bounded Public Health sector. Two organizations, the College of Health and Human Services and Rec Center staff in "Fitwell," stated that they would probably not work with other organizations outside of the bounded Public Health sector in a situation such as this.

Public Health Sector: Tornado Situation Vignette

The organizations within the Public Health sector that each organization reported that they would be working with are illustrated in Figure 3. Of the eight participants in this sector, seven reported that their organization would work with between 1 and 7 other organizations within the sector. Within the bounded network, the Student Health Service was the organization that most informants believed that their organization would be working with (N = 6). In addition, the Student Health Service reported that it would work with the largest number of organizations in a situation such as this (N = 7). One organization, the Wellness Connection, reported that they probably would not work with other organizations within the bounded network in a situation such as the hostage situation.

Between the eight organizations that made up this sector, there were a total of eighteen dyadic links. A large proportion of these (N = 6) were bidirectional ties, most of which involved
the Student Health Service. The overall density of the sector is 0.6429 (SD = 0.4670). There were no organizational isolates in this sector, although the Wellness Connection did not believe that it would be working with other organizations within the bounded sector in this situation.

Seven of the 8 bounded Public Health organizations also indicated that they would probably be working with organizations outside the bounded Public Health sector in this hostage situation. The Student Health Service indicated that they would likely be working with the most organizations outside of the bounded Public Health sector (N = 6). One organization, the College of Health and Human Services, stated that they would probably not work with other organizations outside of the bounded Public Health sector in a situation such as this.

Public Safety Sector: History of Disaster Response

The Public Safety sector’s reported history of contact with other organizations in the sector during previous campus disasters is illustrated in Figure 4. Five of six key informants indicated that their organization had some participation in past disaster response. Participants in this sector listed their organization as working with between 1 - 5 other organizations within the sector. Within the bounded network, Campus Police was the organization that most informants believed that their organization would be working with. Campus Police was nominated by all of the organizations within this sector that had participated in past disaster response, including Transportation and Parking, Environmental Health and Safety, Campus Facilities, and Judicial Affairs. In addition, Campus Police reported that they have worked with every other organization within the sector in the past (N = 5).

Seven dyadic links existed in this sector between the 6 organizations. Of these seven ties, 5 were bidirectional ties, four of which involved Campus Police and other security organizations such as Judicial Affairs, Environmental Health and Safety, Campus Facilities, and Transportation
and Parking. The final bidirectional tie was between Environmental Health and Safety and Campus Facilities. The overall density of the sector is 0.4667 (SD = 0.4230). One organization within this sector, the Criminal Justice Department, reported that it had not participated in past disaster response. There were no organizations in this sector that were isolates. Although one organization indicated that it had not participated in past disaster response, this organization was included by another organization.

All key informants reported that their organization worked with organizations outside the bounded Public Safety sector in past campus disasters. Judicial Affairs indicated that they had worked with the most organizations outside of the bounded Public Safety sector (N = 8). Campus Police, the most central organization of the Public Safety sector, indicated that they had worked with three organizations outside of the bounded Public Safety sector in past disasters. All of the organizations that had responded to past disasters stated that they had worked with at least one organization outside bounded Public Safety sector in their response efforts.

As can be seen in Table 5, similar to the Public Health sector, there were again differences in the level of involvement of different organizations in past campus disasters. Of the organizations that had some history of past disaster response, about half of the representatives of organizations reported that they either “strongly agreed” or “agreed” that their organization played a major role in providing the total number of supplies and equipment (40%, N = 2) and over half of the respondents “strongly agreed” or “agreed” that their organization played a major role in assisting with the aftermath or post-disaster activities (60%, N = 3). No organizations “strongly agreed” or “agreed” that their organization played a major role in providing needed staff and personnel in past disasters. No organizations “strongly agreed” that they played a major role in all three of the areas (providing the supplies, staff, and assisting with the aftermath) across
all of the disasters that they had been involved in. However, one organization, Campus Facilities, “agreed” or “strongly agreed” that they had played a major role in providing assistance in the three areas.

Public Safety Sector: Hostage Situation Vignette

Illustrated in Figure 5 are the organizations within the Public Safety sector that each organization reported they would probably be working with in a hypothetical hostage situation on campus. Of the 6 participants in this sector, 5 stated that their organization would work with between 1 - 4 other organizations within the sector. Campus Police was the organization that most informants believed that their organization would be working with (N = 4). However, Campus Police, along with Judicial Affairs, reported that it would work with only one other organization in a situation such as this. Environmental Health and Safety did not believe that they would be working with any of these organizations. Three organizations (Transportation and Parking, Campus Facilities, and the Criminal Justice Department) reported that they probably would be working with four other organizations within the Public Safety sector in situation such as the hostage situation.

This sector consisted of a total of 11 dyadic links between the 6 organizations in this sector. There were three bidirectional ties in which Campus Police and Judicial Affairs, Campus Facilities and Transportation and Parking, and the Criminal Justice Department and Campus Facilities named each other as probably working together in a situation like this. The overall density of the sector is 0.7334 (SD = 0.4819). There were no organizational isolates in this sector. However, as noted above, one organization, Environmental Health and Safety, indicated that it would probably not be working with other organizations within the bounded Public Safety sector.
Only one (the Criminal Justice Department) of the 6 bounded Public Safety organizations indicated that it would probably not be working with boundary spanning organizations in this hostage situation. Five organizations indicated that they would be working with organizations outside of the bounded Public Safety sector, with Judicial Affairs indicating that they would be working with the most organizations outside of the bounded network (N = 9). Campus Police indicated that they would likely be working with 8 organizations outside of the bounded Public Safety sector.

**Public Safety Sector: Tornado Situation Vignette**

Figure 6 illustrates the organizations within the Public Safety sector that each organization reported that they would probably be working with in a hypothetical disaster situation involving a tornado on campus. Of the 6 participants in this sector, all of them listed that their organization would work with between 1 - 4 other organizations within the sector. Within the bounded network, Campus Police was the organization that most informants believed that their organization would be working with (N = 5). Parking and Transportation reported that it would be working with the largest number of organizations within the bounded network in a situation such as this (N = 4), while Campus Police reported that it would work with 3 other organizations within the bounded Public Safety network.

Eleven dyadic links existed between the 6 organizations that made up the Public Safety sector. There were 6 bidirectional ties, most of which involved either Campus Police or Transportation and Parking. The overall density of the sector is 0.7334 (SD = 0.4819). There were no organizational isolates in this sector and every organization believed that it would be working with at least one other organization within the bounded Public Safety sector in this situation.
For this hostage situation vignette, all of the bounded Public Safety organizations indicated that they would probably be working with organizations outside the bounded Public Safety sector. Judicial Affairs indicated that they would likely be working with the most organizations outside of the bounded Public Safety sector (N = 9). Campus Police indicated that it would be working with eight organizations outside of the bounded Public Safety network.

Communication Sector: History of Disaster Response

Reported contact with other organizations in the bounded Communication network for past campus disasters is illustrated in Figure 7. Of the 16 organizations that were included in the bounded Communication sector, 14 key informants indicated that their organization had some participation in past disaster response and 2 indicated that their organization either did not participate in past disaster response or did not work with other organizations in their response efforts (the Department of Journalism and the Center for International Programs). Informants stated that their organizations had worked with between 4 and 12 other organizations. Within the bounded network, Marketing and Communication was the organization that most informants believed that their organization would be working with (N = 13). Three organizations reported having worked with the largest number of organizations in the past (N = 12): Marketing and Communication, Student Publications, and the Interpersonal Communications Department.

There were a total of 86 dyadic links in this sector between the 16 organizations, including 34 bidirectional ties. The overall density of the sector is 0.7167 (SD = 0.4795). There were no organizational isolates in this sector, although, as stated above, 2 organizations either did not participate in past disaster response or did not work with other organizations in their response efforts.

Ten organizations indicated that they had worked with organizations outside of the
bounded Communication sector in past campus disasters. Student Affairs/Residence Life indicated that they had worked with the most organizations outside of the bounded Communication sector (N = 10). Marketing and Communications, the most central organization of the Communication sector, indicated that they had worked with five organizations outside of the bounded Communication sector in past disasters.

As expected, the level of involvement in past disasters differed from organization to organization within the sector. Of the organizations that had some history of past disaster response, most representatives of organizations reported that they either “strongly agreed” or “agreed” that their organization played a major role in providing the total number of supplies and equipment (50%, N = 6), “strongly agreed” or “agreed” that their organization played a major role in providing needed staff and personnel in past disasters (79%, N =11), and “strongly agreed” or “agreed” that their organization played a major role in assisting with the aftermath or post-disaster activities (72%, N = 10). Two organizations strongly agreed that they played a major role in providing all three types of assistance (supplies, staff, and assisting with the aftermath) across all of the disasters that they had been involved in; these were Human Resources and the Executive Vice President’s Office.

**Communication Sector: Hostage Situation Vignette**

Figure 8 illustrates the organizations within the Communication sector that each organization reported that they would probably be working with in a hypothetical disaster situation involving a hostage situation on campus. Fifteen out of 16 participants in this sector listed that their organization would work with between 1 - 11 other organizations within the sector. Within the bounded network, Marketing and Communications was the organization that most informants believed that their organization would be working with (N = 14). The
Telecommunications Department reported that it would work with the largest number of organizations in a situation such as this (N = 11). Marketing and Communications, the most central organization in this sector, believed that they would be working with 8 other organizations in a disaster such as this hostage situation. The Center for International Programs is the organization that reported they probably would not work with other organizations within the bounded network in a situation such as the hostage situation.

There were a total of 73 dyadic links between the sixteen organizations that made up the Communications sector. There were 21 bidirectional ties, most of which involved Marketing and Communications. The overall density of the sector is 0.6083 (SD = 0.4601). There were no organizational isolates in this sector. However, as noted above, the Center for International Programs indicated that they would probably not be working with other organizations within the bounded Communication sector.

Ten of the 16 bounded Communication organizations also indicated they would be working with organizations outside the bounded Communication sector in this hostage situation. The Monitor indicated that they would probably be working with the most off-campus organizations (N = 6). Marketing and Communications indicated that they would likely be working with two organizations outside of the bounded Communication sector. Six organizations stated that they would probably not work with other organizations outside of the bounded Communication sector in a situation such as this.

*Communication Sector: Tornado Situation Vignette*

Figure 9 illustrates the organizations within the Communication sector that each organization reported that they would probably be working with during a hypothetical tornado situation on campus. Fifteen participants in this sector indicated that their organization would
work with between 1 - 11 other organizations within the sector. Within the bounded network, Marketing and Communications was the organization most informants believed their organization would be working with (N = 14). In addition, three organizations stated that they would be working with the most organizations on campus (N =11). These organizations were Marketing and Communications, the office of the Executive Vice President, and the Telecommunications Department. The organization that did not believe that it would be working with other organizations within the bounded network during this situation was the Center for International Programs.

A total of 86 dyadic links existed between the 16 organizations in the bounded network that made up this sector. There were 28 bidirectional ties included within the bounded network, most involving Marketing and Communications and another organization. The overall density of the sector is 0.7167 (SD = 0.4795). There were no organizational isolates in this sector. However, one organization indicated that it would probably not be working with other organizations within the bounded Communication sector, although they would be working with organizations outside the bounded network.

Twelve of the 16 bounded Communication sector organizations also indicated that they would probably be working with organizations outside the bounded Communication sector in this tornado situation. The four organizations that indicated that they would probably not be working with off-campus organizations were the Treasurer's Office, Office of Campus Activities, Human Resources, and Registration and Records. Two participants stated that their organization would work with the most off campus organizations (N = 6). These were Student Publications at BGSU and The Monitor. Marketing and Communications indicated that they would likely be working with two organizations outside of the bounded Communication sector.
DISCUSSION

This study examined three disaster response networks (Public Health, Public Safety, Communication) on a university campus for disaster planning purposes. A total of 30 key informants representing 30 campus units provided information on the structure of their organization, previous response efforts, and expected responses in two vignette situations, as well as other information.

In each sector (Public Health, Public Safety, Communication), key informants from the organizations identified other important organizations with whom they had worked in response to past disasters. For each sector, one campus organization was identified as a central organization for the sector. For the Public Health sector, the Student Health Service was the one organization that other organizations most frequently identified working with, making it the most central organization. In the Public Safety sector, Campus Police was identified as the most central organization. Finally, in the Communications sector, Marketing and Communications was the most central organization. The key organization identified for each sector is particularly important because this organization has the capacity to act as a link between other organizations in that sector. According to Gillespie, et. al. (1993), a network with a star formation, in which one organization serves as a communication hub for the system, is the most centralized type of network. These centralized organizations have a place in the sector that would allow them to act as leaders to the other organizations in a particular disaster situation. A centralizing unit is essential in a disaster for facilitating the organization and communication between units; it has the ability to take on a leadership role (Gillespie, et. al, 1993). An optimum level of network centrality is difficult to determine, as it is unclear whether highly centralized systems outperform less centralized systems (Johnsen, Morrissey, and Calloway, 1996).
There were many structural similarities in the three network sectors examined in the present study. None of the sectors studied contained any organizational clusters; all but one organization in the Public Health sector were linked together to at least one other organization in the sector. This organizational linking is important because all organizations, representing all of the sector’s resources, should be linked to assist in efficient utilization of services during a disaster (Gillespie and Murty, 1994). Clusters of organizations that are not connected to the larger network within a sector are detrimental to the sector because these clusters may not be accessible to the larger network or may be indirectly connected, impeding the sector’s ability to work efficiently as a coordinated group (Gillespie and Murty, 1994).

The Public Health network sector is the only sector of the three assessed in which there was an organizational isolate. Despite its position as part of the Public Health sector on campus, the Public and Allied Heath Department did not appear to work with other Public Health organizations and no other Public Health organization stated that it had worked with the Public and Allied Heath Department in the past. Organizational isolates are a large problem for sectors for much the same reason that organizational clusters are an issue. When an organization is isolated from the larger sector, resources that the organization might contribute or may need could get lost in the disaster response, services may be duplicated, or pertinent information relevant to response efforts may get lost (Gillespie and Murty, 1994). Across all three sectors, a total of five other organizations, three in the Public Health sector and two in the Communications sector, stated that they had not worked in previous disasters. However, key informants from other organizations stated that they had worked with these organizations, creating connections between the organizations that prevented them from becoming isolates.

Density varied across the three sectors and across the three situations. As stated
previously, density can range from 0, suggesting that the network has no connections, to 1.00, suggesting that every organization in the network is connected to every other organization (Johnsen, Morrissey, and Calloway, 1996). The smallest network density calculated was .3214 in the Public Health sector for the history of disaster response. This suggests that in previous disasters, organizations in the Public Health network were least well-connected within the sector in the past. However, in the hostage situation, the density of the sector suggested that there would be more connections between organizations (.5714) and the most connections in this sector were expected to occur during a larger scale disaster such as a tornado on campus (.6429). With the two disaster vignettes, as the severity of the disaster increased, density also increased.

We would expect that organizations in a sector would need more assistance and therefore reach out to each other more given a more severe situation. However, it is important to note that because the density for the history of past disaster response in the Public Health sector is lower than the density for the vignettes, it is evident that the sector has not made all of the connections between organizations in the past that it believes would be necessary under the vignette conditions. If organizations anticipate working together following a major disaster, building these additional connections may be an area that disaster planners could focus on improving in advance of a serious disaster. For example, this could take the form of formalized mutual aid plans or by establishing familiarity with staff of each organizations functions, roles, and resources.

In contrast, the Public Safety sector seems to be more well-connected in terms of network density. When examined, the network density for organizations within this sector across past disasters is .4667. As is the case with the Public Health sector, this number increases for the hypothetical small scale disaster situation (.7334). However, we would expect the density for the
large scale disaster to increase as well, but the density for the large-scale disaster is the same as the density for the small scale disaster (.7334). These network densities are higher than those for Public Health; therefore the Public Safety sector has more cohesion between individual organizations in the sector than the organizations in Public Health do. As in the Public Health sector, the densities for the vignettes are higher than those for the sector’s history of disaster response, suggesting that expectations for response in a similar disaster in the future would require more connectedness between organizations in the sector than there has been in the past. It is interesting that the small scale disaster illicit the same density as the large scale disaster. This may suggest that this type of disaster would be equally taxing to the organizations in the Public Safety Sector as a small scale disaster would. It could also indicate that organizations in the Public Safety Sector would work with one another more than is necessary in a small scale disaster or less than is necessary in a large scale disaster.

As opposed to the other two sectors, data for the Communications sector suggest that equal network densities for this sector occurred in the past disaster as would be expected to occur in a large-scale disaster (.7167). The lowest density for this sector is expected to occur in the small scale disaster (.6083). There are several possibilities for the differences in the pattern of density compared to the other two sectors. These results suggest that, in the past, more organizations were involved in response efforts than might have been necessary. Alternatively, key informants may be underestimating the connectedness, or the need for connectedness, of their own or other organizations in the two hypothetical disaster situations. It is also possible that the density of the past disaster response was artificially inflated by combining all past disaster responses for the sector into one response set. If this were the case, however, it is noteworthy that for this sector, the large scale disaster would elicit connectedness in the sector that is the same as
the total network connectedness in all disasters that were responded to in the past. Key, however, is that the sector continues to show an increase in the level of connectedness from the smaller disaster vignette to the larger disaster vignette.

Reciprocity between organizations is an indicator that two organizations are especially well connected to each other because each considers the other an important organization for responding to disasters. As with network density, the Public Health and Public Safety sectors had the highest reciprocity for the tornado vignette. The Public Health sector had equal reciprocity in past disasters and in the hostage situation vignette. Public Safety had a much higher level of reciprocity in past disasters than it had in the hostage situation vignette. The Communications network had the highest reciprocity in past disasters, followed by the tornado situation, and the least reciprocity in the hostage situation. Similar patterns for sector density and sector reciprocity should be expected since organizational reciprocity is, in part, a description of the network density.

It would seem that all organizations would have bidirectional ties in this type of network analysis, due to the fact that each organization that indicated that it worked with another organization should also be designated in return. However, there are several reasons that this might not be true. First, as has been discussed above, individuals who responded to the survey may have differing definitions of a campus disaster, considering some situations an emergency or disaster that another individual might not. In addition, key informants differed in the length of time that they had worked for their organization. Therefore, some of them may not have been around when the organization participated in a response effort. Additionally, some informants simply may not have recalled a campus emergency or may not have recalled another organization being involved in the response efforts. These factors are important to consider when
examining the figures for bidirectional ties, and in a larger sense, in examining the figures for the presence or absence of individual dyadic links within a sector.

In terms of boundary spanners, every sector had organizations outside the bounded network that organizations within the sector stated they had worked with or believed they would be working with. The small scale disaster situation consistently had the least organizations involved that were outside the bounded network, ranging from 11 to 15 organizations across sectors. The number of boundary spanning organizations was approximately the same for the past disaster situations and the large scale vignette across all three sectors, ranging from 15 to 17.

The University has close ties to the surrounding community and often closely works with organizations outside of the University for the provision of a variety of services. It is to be expected, then, that in disaster situations many of the organizations involved in the response effort would contact these organizations that they already have relationships with to receive help. In addition, University organizations may be obligated to contact other organizations outside of the University in a disaster situation due to a lack of adequate resources, an inability to adequately manage the disaster within the university, or due to procedures or laws that mandate that the University have other organizations be involved. Again, it is interesting that the number of organizations that have been involved in past disasters closely resembles the number of organizations that might be involved in a large scale disaster. This suggests that organizations will likely turn to many of the same organizations that they have previous relationships with for assistance in a new disaster. The existence of these previous relationships is important because these previous working relationships might help to speed future response efforts. However, relying heavily on the assistance of organizations outside of the University could cause a problem if the disaster that strikes the University also impacts the larger city around it. The
University may be unable to get the help it would need and expect if the city was responding to
the same crisis, making it even more important that the University be prepared to use the
resources that it has on campus to respond or be able to obtain needed resources outside the
region.

It is also important to note that Campus Police and Environmental Health and Safety
were the only two organizations within the three sectors examined in this study that were
nominated as having worked with organizations in the Public Health and in the Communication
sectors, indicating that these two organizations cross all three sectors. As for boundary spanning
organizations, the university counseling center was the only campus organization that was
involved in past disaster response in all three sectors.

For this university, the highest organizational density across all three situations occurred
in the Public Safety sector, followed by the Communications sector. Again, it is worth noting
that the Communications sector reported being as well-connected for past disasters as for the
large-scale disaster vignette, while the Public Safety sector reported that it expects to be more
well-connected for the hypothetical disaster situations. As for the ratio of links to other
organizations within the sector, the Public Health sector had the fewest links at the University.
For administrators who seek to make improvements to the disaster response networks on this
campus, the Public Health sector might benefit from some additional planning efforts.

Study Limitations

The limitations of the present study are similar to limitations seen in many studies that
utilize network methodology. Clearly, the network sectors studied in the present research are not
independent from one another. All of the organizations exist within a relatively small campus
community. Therefore, several organizations were very important in more than one network. For
example, as this study shows, Campus Police was an important organization in the Public Safety network. However, the campus security organization also works closely with organizations from the Communications network as well. To simplify the research, for the purposes of this study, each organization was considered to fit in only one network sector. As a result, some information about the way in which organizations cross network sectors may have been limited. One major reason for limiting each organization to one sector was due to anticipated difficulty in finding different key informants to accurately speak for the organization’s performance in the different sectors.

Information collected in this study constitutes each key informant’s views and opinions of their organization. In addition, key informants in this study were of different levels in the organization, differed in the amount of time they worked at the organization, and had differing levels of familiarity with their organization’s disaster response procedures and past participation. Therefore, as in most studies utilizing network analysis, replicating these findings using other individuals as key informants might be difficult. Future studies may find it useful, although difficult, to interview more than one key informant for an organization and to integrate the findings.

Due to difficulties in defining what constitutes a disaster, the definition of a disaster was purposefully not provided to participants as they were asked to describe their organization’s participation in past disasters. Without an explicitly defined definition of a “disaster,” individuals in different organizations may have conceptualized previous campus events that constituted a disaster differently. This makes comparisons of the past disaster activity more difficult, because there are differences in the scale of events that key informants from various organization included in their descriptions of past disaster activities. Due to these definitional differences,
some key informants stated that their organizations had never been involved in a campus emergency or disaster, while others stated that they had been involved several or many within the past few years. In the community that this research took place, a mid-size university, there have been few incidents that would fall under a traditional definition of a disaster. However, because the community is so small, smaller incidents that would not be defined as a disaster on another campus or in a city have a larger effect on the community.

**Implications of a Network Approach for University Disaster Preparedness**

This study used network analysis to examine three network sectors on a mid-size university campus in terms of disaster preparedness. Those individuals who are involved with disaster planning at the University may find study results useful in determining the adequacy of their disaster preparedness planning. Present findings can also be used as a base-line to understand the impact of changes in disaster preparedness. For example, system-level change can be assessed by measuring networks a second time and comparing the density and centralization of network sectors (Johnsen, Morrissey, & Calloway, 1996)

The results of this study suggest several issues for future consideration by University administrators. For example, it is clear that each network sector has one organization that is positioned in the center of the network and has ties to many other organizations in the sector. University disaster planners may decide that the sectors could be improved by making these organizations formally recognized as central units for each sector in future response efforts. There could be several benefits to this decision. For example, this might give that organization the responsibility for and power to make contacts with every organization that exists in its sector in preparation for a disaster. It may facilitate communication and awareness of disaster activities
between organizations in a given sector with the assistance of the central organization. Finally, it could allow other sectors to communicate with each other through linking central organizations.

This research also suggests that University disaster planners or organizational representatives from each sector examine individual links between individual organizations in the larger sector and discuss alternative structures. For example, in the Public Health sector, the Public and Allied Heath Department has not been involved in past disaster response efforts and is not linked to the larger Public Health sector. If planners believe that the university could benefit from services or resources this organization could provide, it might be helpful to create connections between this organization and at least one other response organization to assist in the provision of these services or resources. Going a step further, disaster response planners could also attend to the connections that university organizations make with organizations outside the bounded networks in much the same way.

This study also indicates that connections between organizations within a sector may benefit from developing organizational contacts or liaisons. Insuring that appropriate organizational contacts exist that would facilitate response efforts in a larger-scale emergency would benefit each sector and the University community. Similar to the methodology of the present research, each organization would project the organizations that it would work with in a variety of situations, assess whether contacts exist with each of these organizations, and would be responsible for ensuring that both organizations have plans that would facilitate these collaborations. In the event of an emergency, it would be expected that these organizational contacts would decrease confusion and increase response times.

In regard to services delivered by organizations in each sector, this research suggests that sectors may benefit from defining which organizations are responsible for providing staff and
personnel, furnishing supplies and equipment, and assisting with post disaster activities. For some sectors, it was unclear at the conclusion of this research which organizations provided the majority of each of these services. For example, in the Public Safety sector, none of the key informants believed that their organization played a major role in providing needed staff and personnel. Was there another organization that stepped in from outside of the network? On the other hand, all of the key informants interviewed in the Public Health sector believed that their organization played a major role in the aftermath or post-disaster activities. Were different organizations involved in different response efforts? Sectors could also use information regarding the provision of services as a starting point for creating more specific response plans for given situations that include expectations for which organizations will provide what amount of needed services.

Although specific findings from this study do not generalize to other university settings, the type of network assessment techniques used in the present study may be helpful in aiding officials at other universities who wish to evaluate their own response networks. Other universities may benefit from this kind of network assessment to help them determine the structure of networks in their settings. Given the many particular strengths of a network assessment, including the ease with which data can be collected, applied, and analyzed, the low cost of the implementation, and the amount of information it can provide, a network assessment can be a helpful tool for making changes to a disaster response sector to improve its functioning.

The incidents that occurred after Hurricane Katrina and more recently at Virginia Tech highlight the need for universities to use diverse techniques to ensure their responses to a variety of possible occurrences. Network assessment is one of these tools that universities may find helpful in facilitating greater disaster preparedness. This method may also serve as a model for
analyzing disaster response in a variety of response networks, such as large cities or within smaller organizations, such as a hospital. As administrators search for ways to better their understanding of the organizations preparedness for disaster, a network approach can be a straightforward and cost effective method that produces workable results.
REFERENCES


EM-DAT: The OFDA/CRED International Disaster Database - www.em-dat.net - Université Catholique de Louvain - Brussels – Belgium


Table 1

Some Basic Elements of a Network Approach

<table>
<thead>
<tr>
<th>Network Concept</th>
<th>Definition</th>
<th>Description</th>
<th>Method of calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Graph</td>
<td>A visual representation of all organizations in the network and the links among them.</td>
<td>Chart or figure illustrating network nodes and links can facilitate interpretation of network relationships.</td>
<td>N/A</td>
</tr>
<tr>
<td>Centrality</td>
<td>Organizations that are most central or connected in the network.</td>
<td>“Central” network nodes can facilitate or block information and resource exchange.</td>
<td>-Node(s) in the network with the most links to other nodes. - Can use UCINET</td>
</tr>
<tr>
<td>Crack</td>
<td>Used to describe problems within the network.</td>
<td>Can consist of problems such as missing services, inaccessible services, administrative oversight, inappropriate referrals, and missing information</td>
<td>- Found by looking for problems in the network. -May or may not be apparent in the Network Graph</td>
</tr>
<tr>
<td>Poor Linkage Cracks</td>
<td>Type A: Organizations with essential services that have no interactions with rest of network.</td>
<td>“Isolate” nodes can be viewed as untapped network resources.</td>
<td>- Found by searching the Network Graph for organizations with no links to the network</td>
</tr>
<tr>
<td>Poor Linkage Cracks</td>
<td>Type B: Cluster of organizations connected to network by long and indirect series of links.</td>
<td>“Isolate” clusters can serve specialized functions in information and resource exchange.</td>
<td>- Found by searching the Network Graph for groups of connected organizations not linked to the larger network</td>
</tr>
<tr>
<td>Network Density</td>
<td>The ratio of actual relations to the total number of possible relations in a network.</td>
<td>Density index ranges from 0 (no interconnections) to 1 (total network interconnectedness).</td>
<td>- Number of links in the network divided by the number of possible links - Can use UCINET</td>
</tr>
<tr>
<td>Boundary Spanning</td>
<td>Degree to which organizations within the network have links with organizations outside the network.</td>
<td>A number or ratio of organizations that have links to organizations outside of the bounded network.</td>
<td>- Found by tallying the number of organizations outside the bounded network that an organization reported working with.</td>
</tr>
<tr>
<td>Dyadic Links</td>
<td>Links between two organizations in a network</td>
<td>Occurs when one organization within a network reports a relationship with another organization in a network. Network density increases when there are more dyadic links between organizations.</td>
<td>- Found by tallying the number of relationships between organizations. Usually reported by organization. The total number of dyadic links in a network is used to compute network density.</td>
</tr>
<tr>
<td>Reciprocity or Bidirectional Ties</td>
<td>Extent to which dyadic pairs both send and receive information.</td>
<td>Reciprocal nodes typically have stronger ties than non-reciprocal nodes.</td>
<td>- Found by searching the Network Graph for instances in which two organizations nominated each other as a link</td>
</tr>
</tbody>
</table>
Table 2

*Public Health Sector Bounded Network*

<table>
<thead>
<tr>
<th>Network Structure (N = 8 org. in bounded network)</th>
<th>Past Disasters (N = 5/8 org. in past disasters)</th>
<th>Small Scale Disaster (Hostage Vignette)</th>
<th>Large Scale Disaster (Tornado Vignette)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrality</td>
<td>Health Center</td>
<td>Health Center/Disability Services</td>
<td>Health Center</td>
</tr>
<tr>
<td>Reciprocity</td>
<td>2 links</td>
<td>2 links</td>
<td>6 links</td>
</tr>
<tr>
<td>Density</td>
<td>.3124</td>
<td>.5714</td>
<td>.6429</td>
</tr>
<tr>
<td>Isolates</td>
<td>1</td>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>Clusters</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Boundary Spanners</td>
<td>Athletic Trainers (5)</td>
<td>Public and Allied Heath Department (4)</td>
<td>Health Center (6)</td>
</tr>
<tr>
<td></td>
<td>Health Center (2)</td>
<td>Health Center (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disability Services (2)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3

**Public Safety Sector Bounded Network**

<table>
<thead>
<tr>
<th>Network Structure (N = 6 org. in bounded network)</th>
<th>Past Disasters (N = 5/6 org. in past disasters)</th>
<th>Small Scale Disaster (Hostage Vignette)</th>
<th>Large Scale Disaster (Tornado Vignette)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrality</td>
<td>Campus Police</td>
<td>Campus Police</td>
<td>Campus Police</td>
</tr>
<tr>
<td>Reciprocity</td>
<td>5 links</td>
<td>3 links</td>
<td>6 links</td>
</tr>
<tr>
<td>Density</td>
<td>.4667</td>
<td>.7334</td>
<td>.7334</td>
</tr>
<tr>
<td>Isolates</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Clusters</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Boundary Spanners</td>
<td>Judicial Affairs (8)</td>
<td>Judicial Affairs (9)</td>
<td>Judicial Affairs (9)</td>
</tr>
<tr>
<td></td>
<td>Campus Police (3)</td>
<td>Campus Police (8)</td>
<td>Campus Police (8)</td>
</tr>
</tbody>
</table>
Table 4

*Communication Bounded Network*

<table>
<thead>
<tr>
<th>Network Structure (N = 16 org. in bounded network)</th>
<th>Past Disasters (N = 14/16 org. in past disasters)</th>
<th>Small Scale Disaster (Hostage Vignette)</th>
<th>Large Scale Disaster (Tornado Vignette)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reciprocity</td>
<td>34 links</td>
<td>21 links</td>
<td>28 links</td>
</tr>
<tr>
<td>Density</td>
<td>.7166</td>
<td>.6083</td>
<td>.7166</td>
</tr>
<tr>
<td>Isolates</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Clusters</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
Table 5

Reported Level of Involvement in the Three Sectors for Past Campus Disasters

<table>
<thead>
<tr>
<th>Sector</th>
<th>Provided the total number of supplies and equipment</th>
<th>Played a major role in providing needed staff and personnel</th>
<th>Played a major role in assisting with the aftermath or post-disaster activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Sector</td>
<td>strongly agreed or agreed: 60% N = 3</td>
<td>strongly disagreed or disagreed: 20% N = 1</td>
<td>strongly disagreed or disagreed: 20% N = 1</td>
</tr>
<tr>
<td></td>
<td>neutral: 20% N = 1</td>
<td>neutral: 80% N = 4</td>
<td>neutral: 0% N = 0</td>
</tr>
<tr>
<td></td>
<td>strongly disagreed or disagreed: 20% N = 1</td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
<td>strongly disagreed or disagreed: 20% N = 1</td>
</tr>
<tr>
<td></td>
<td>neutral: 80% N = 4</td>
<td>neutral: 0% N = 0</td>
<td>neutral: 100% N = 5</td>
</tr>
<tr>
<td></td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
<td>strongly disagreed or disagreed: 20% N = 1</td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
</tr>
<tr>
<td></td>
<td>neutral: 0% N = 0</td>
<td>neutral: 0% N = 0</td>
<td>neutral: 0% N = 0</td>
</tr>
<tr>
<td>Public Safety</td>
<td>strongly agreed or agreed: 40% N = 2</td>
<td>strongly disagreed or disagreed: 20% N = 1</td>
<td>strongly disagreed or disagreed: 20% N = 1</td>
</tr>
<tr>
<td></td>
<td>neutral: 20% N = 1</td>
<td>neutral: 0% N = 0</td>
<td>neutral: 100% N = 5</td>
</tr>
<tr>
<td></td>
<td>strongly disagreed or disagreed: 40% N = 2</td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
<td>strongly disagreed or disagreed: 60% N = 3</td>
</tr>
<tr>
<td></td>
<td>neutral: 0% N = 0</td>
<td>neutral: 0% N = 0</td>
<td>neutral: 40% N = 2</td>
</tr>
<tr>
<td></td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
</tr>
<tr>
<td></td>
<td>neutral: 0% N = 0</td>
<td>neutral: 0% N = 0</td>
<td>neutral: 0% N = 0</td>
</tr>
<tr>
<td>Communication</td>
<td>strongly agreed or agreed: 50% N = 7</td>
<td>strongly disagreed or disagreed: 29% N = 4</td>
<td>strongly disagreed or disagreed: 21% N = 3</td>
</tr>
<tr>
<td></td>
<td>neutral: 29% N = 4</td>
<td>neutral: 79% N = 11</td>
<td>neutral: 14% N = 2</td>
</tr>
<tr>
<td></td>
<td>strongly disagreed or disagreed: 21% N = 3</td>
<td>strongly disagreed or disagreed: 7% N = 1</td>
<td>neutral: 72% N = 10</td>
</tr>
<tr>
<td></td>
<td>neutral: 79% N = 11</td>
<td>neutral: 7% N = 1</td>
<td>neutral: 29% N = 4</td>
</tr>
<tr>
<td></td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
<td>strongly disagreed or disagreed: 0% N = 0</td>
</tr>
<tr>
<td></td>
<td>neutral: 0% N = 0</td>
<td>neutral: 0% N = 0</td>
<td>neutral: 0% N = 0</td>
</tr>
</tbody>
</table>

(Total organizations: Health Sector: 8, 5 were involved in past disasters; Public Safety: 6, all were involved in past disasters; Communication: 16, 14 were involved in past disasters)
Figure 1

Public Health Sector History of Disaster Response
Figure 2

*Public Health Sector Hostage Situation Vignette*
Figure 3

Public Health Sector Tornado Situation Vignette
Figure 4

*Public Safety Sector History of Disaster Response*
Figure 5

Public Safety Sector Hostage Situation Vignette
Figure 6

*Public Safety Sector Tornado Situation Vignette*
Figure 7

*Communication Sector History of Disaster Response*
Figure 8

Communication Sector Hostage Situation Vignette
Figure 9

Communication Sector Tornado Situation Vignette
Appendix A

Disaster Response Network Assessment Questionnaire
For Health First Responders

Introduction: As you know, our team is attempting to learn more about the law health resources on campus in response to disaster and the ways in which these resources have been employed during emergencies or disasters. We hope to explore future options for mobilizing and coordinating available resources. We believe that the best way to get a comprehensive view of the system and accurately determine opinions of its leaders is to do face to face interviews. For this reason, we may be audio taping the interview for accuracy. Additionally, our questions are focused on the health first responders on this campus. We appreciate your time in helping us to meet our goals.

As we begin, I would like you to think about disasters, emergencies, and crises in terms of large scale events that threatens to override the normal human capacity to cope.

Background Information:

I would like to start by asking a few questions about you and __________ (your unit/organization). (For the remainder of the assessment, replace “your unit/organization” with the organization that the respondent is representing.)

Your position (job title):

Number of years in this position at BG:

Total number of years in/at __________ (this unit/organization): (not necessarily total number of years at BG)

Your gender: M F Your date of birth:

We are interested in learning more about different types of resources that we have in the university community that could be tapped in case of an emergency or disaster. Right now we are focusing on health resources available at BG. I will talking with you about a number of different issues and I want you to feel free to let me know if you have any questions as we go along.
In a campus emergency or disaster situation, what types of health services do you think the ________________(name of unit or organization) would be capable to provide? Read the list of services and circle all that apply:

Heath Care:

- Provide first aid on-site at disaster
- Provide larger procedures on-site at disaster
- Provide first aid at hospital/offices
- Provide larger procedures at hospital/offices
- Procuring food
- Procuring health supplies
- Track the use of health care resources
- Reuniting victims with families
- Identifying critically injured or deceased persons
- Estimate the number of injured and loss of life
- Provide materials and facilities for urgent health care
- other (describe)

(prompt respondent for the reasons why this service is unique).

Collect the card from the respondent.

*We are interested in learning more about the capacity of ____________ (your unit/organization) to provide help during an emergency or disaster.*

(Size of organization:)

About how many individuals (including faculty, staff, and students) in your unit are trained or qualified to provide some type of health services?

How are these people trained or qualified to provide health services in the event of a disaster?

About how many people in your unit would you envision helping to provide support or communications assistance (staffing phones, providing directions, other forms of support and assistance) in the event of a disaster?

*History of Campus Emergency/Disaster Response*

(If at any time the respondents begin discussing off-campus emergencies, remind them we are interested in involvement on campus.)

In the past 3 or 4 years, can you think of any types of campus emergency or disaster situations where your unit/organization contributed some type of communications assistance? Examples of campus emergency situations could include situations involving the death or serious injury of one or more students, faculty, or staff, the sudden displacement of students, the perception that a significant danger exists, or a large scale tragedy affecting the broader community. For example, past crises at BGSU might
include the sudden death of a football player, a residence hall fire that resulted in the sudden displacement of students, or the presence of a stalker causing distress to residents of a dorm.

- **(If YES)**
  What kinds of health assistance did your unit/organization contribute? *(List the emergency situations the respondent listed in the earlier question. Inquire what members of unit contributed what types of services to what populations or groups).*
  PROVIDE LIST

- **(Continue if YES)**
  If so, what other health units/organizations did you work with to provide assistance? *(List organizations that unit has worked with in past disasters).*
  *(Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others)* PROVIDE LIST

**Responding to Campus Emergency/Disaster**

Now I would like to describe a campus disaster situation and ask you to consider how __________ (your unit/organization) might respond.

Vignette One: On a weekday evening at 10:00pm in Jerome Library, an unidentified individual took two students and one staff member hostage in a small study room. At least one of the hostage students has been confirmed to be injured. Law enforcement officials have been responding and negotiating for twelve hours. It is currently 10:00am the next weekday and campus wide announcements regarding the situation have been made.

Imagine that __________ (your unit/organization) were asked to provide health services to the campus community in this situation.

What person or organization would be most likely to contact __________ (your unit/organization)? *(Inquire what the name of the organization/unit is and the name of the person by whom the respondent would be contacted).*

Would your organization be willing to respond to this hostage situation with health services?

Would your organization have the capacity to respond to this hostage situation with health services?

Please describe which individuals and what types of health services __________ (your unit/organization) might contribute to this hostage situation? How would those individuals and services be mobilized?
If ________ (your unit/organization) were asked to help provide health services in this hostage situation, what other on or off campus health units/organizations do you believe that you would likely be working with? (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

If ________ (your unit/organization) was unable to provide all the necessary health services in this hostage situation, who else on or off campus might you contact for additional support and why? (Invite respondent to list people and units/organizations both on and off campus that they would probably contact and provide a reason for the choice). (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

What plans, if any, are currently in place that would allow ________ (your unit/organization) to respond quickly to provide health services in an emergency/disaster such as this hostage situation?

(If respondent notes some disaster response plans)
What possible limitations do you foresee arising that could impede your organization’s ability to implement these plans? (If respond does not mention time and resource constraints, inquire whether or not these could be a limitation.)

What specialized health crisis training, if any, have individuals in your unit/organization had that would help them to respond to an emergency such as this hostage situation?

I just asked you to imagine that your organization was asked to provide health services to the campus community in this hostage situation. Do you believe that your organization would actually be contacted in a situation such as this?
Circle One
No		Maybe		Definitely

Now I would like to describe a different campus emergency situation.

Vignette Two: On a weekday morning at 10:00am, a tornado touches down on campus, damaging a residence hall and the student recreation center. It is approximated that there are 50-75 deaths and about 200 people injured.

Imagine that ________ (your unit/organization) were asked to provide health services to the campus community in this situation.

What person or organization would be most likely to contact ________ (your unit/organization)? (Inquire what the name of the organization/unit is and the name of the person by whom the respondent would be contacted).

Would your organization be willing to respond to this tornado situation with health services?
Would your organization have the capacity to respond to this tornado situation with health services?

Please describe which individuals and what types of health services ________ (your unit/organization) might contribute to this tornado situation? How would those individuals and services be mobilized?

If ____________ (your unit/organization) were asked to help provide health services in this tornado situation, what other on or off campus health units/organizations do you believe that you would likely be working with?

(Provide list of BGSU in-network, BGSU out of network, BG community, and any others)

If __________ (your unit/organization) was unable to provide all the necessary health services in this tornado situation, who else on or off campus might you contact for additional support and why? (Invite respondent to list people and units/organizations both on and off campus that they would probably contact and provide a reason for the choice). (Provide list of BGSU in-network, BGSU out of network, BG community, and any others)

What plans, if any, are currently in place that would allow ________ (your unit/organization) to respond quickly to provide health services in an emergency/disaster such as this tornado situation?

(If respondent notes some disaster response plans)

What possible limitations do you foresee arising that could impede your organization’s ability to implement these plans? (If respond does not mention time and resource constraints, inquire whether or not these could be a limitation.)

What specialized health crisis training, if any, have individuals in your unit/organization had that would help them to respond to an emergency such as this tornado situation?

I just asked you to imagine that your organization was asked to provide health services to the campus community in this tornado situation. Do you believe that your organization would actually be contacted in a situation such as this?

Circle One

No
Maybe
Definitely

Reflections on Emergency Disaster Planning

I have asked you a number of questions about campus emergency disaster planning, and I would like to better understand your own feelings about the topic.
Is there anyone else from your organization or from other organizations on campus that you think we should interview?  
(Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

Are you aware of any existing university wide plans for responding to a crisis or disaster?  
• (If yes)  
  Do you know if your unit/organization plays any role in the plan?

What do you feel are the most important things that BGSU should consider in developing and implementing an emergency disaster plan?

What kinds of things would have to happen for __________ your unit/organization to be able to quickly and effectively mobilize health resources in case of a serious campus emergency or disaster?

What could the university do to assist __________ your unit/organization in emergency disaster planning?

Are there other things that you think are important for me to know about emergency disaster planning within your organization or on this campus? (Prompt for opinions to both organization and campus concerns.)

(Provide respondent with closing and anticipated next steps in the assessment and planning process.) Thank you for your time. This information will be used in my thesis and will be distributed to members of the network after it has been analyzed. It is my hope that this information can be used by organizations in this network to inform future planning efforts.
Appendix B

Disaster Response Network Assessment Questionnaire
For Public Safety

**Introduction**: As you know, our team is attempting to learn more about the law enforcement/health resources on campus in response to disaster and the ways in which these resources have been employed during emergencies or disasters. We hope to explore future options for mobilizing and coordinating available resources. We believe that the best way to get a comprehensive view of the system and accurately determine opinions of its leaders is to do face to face interviews. For this reason, we may be audio taping the interview for accuracy. Additionally, our questions are focused on the law enforcement/health first responders on this campus. We appreciate your time in helping us to meet our goals.

As we begin, I would like you to think about disasters, emergencies, and crises in terms of large scale events that threatens to override the normal human capacity to cope.

**Background Information**:

I would like to start by asking a few questions about you and ______________ (your unit/organization). (For the remainder of the assessment, replace “your unit/organization” with the organization that the respondent is representing.)

Your position (job title):

Number of years in this position at BG:

Total number of years in/at ______________ (this unit/organization): (not necessarily total number of years at BG)

Your gender: M F Your date of birth:

We are interested in learning more about different types of resources that we have in the university community that could be tapped in case of an emergency or disaster. Right now we are focusing on public safety resources available at BG. I will talking with you about a number of different issues and I want you to feel free to let me know if you have any questions as we go along.
In a campus emergency or disaster situation, what types of public safety services do you think the ______________________ (name of unit or organization) would be capable to provide?

Read the list of services and circle all that apply:

Law Enforcement:
- Set up a parameter (barricade and put up signs)
- Allow/Deny access to the area
- Remove injured persons from the area
- Removal of debris from the area
- Assist in medical/first aid operations
- Communicate with media/public relations officers
- Assist in communication with other response teams
- Assist in the investigation (causes, suspects)
- Apprehend suspects
- Determine other potential hazards (collapse zones, presence of hazardous materials)
- Ensure maintenance of law and order (reduce panic)
- Collaborate/Lead evacuation procedures
- Assist with the transportation of victims (to home or to hospital)
- Assist in restoration/continued operation/ redirection of utility services (water, wastewater, gas, and electric)
- Reunite victims with families
- Reunite lost or people without access to homes with their families
- Provide documentation of the damages (nature/severity/extent)
- Track the use of law enforcement resources
- Identify critically injured or deceased persons
- Estimate the number of injured and loss of life
- Estimate the dollar value of the loss
- Procure food, fuel, and/or health supplies
- Other (Please describe)

(prompt respondent for the reasons why this service is unique).

We are interested in learning more about the capacity of ____________ (your unit/organization) to provide help during an emergency or disaster.

(Size of organization:)

About how many individuals, including faculty, staff, and students, in your unit are trained or qualified to provide some type of public safety services?

How are these people trained or qualified to provide public safety services in the event of a disaster?

About how many people in your unit would you envision helping to provide support or communications assistance (staffing phones, providing directions, other forms of support and assistance) in the event of a disaster?
History of Campus Emergency/Disaster Response

(If at any time the respondents begin discussing off-campus emergencies, remind them we are interested in involvement on campus.)

In the past 3 or 4 years, can you think of any types of campus emergency or disaster situations where your unit/organization contributed some type of communications assistance? Examples of campus emergency situations could include situations involving the death or serious injury of one or more students, faculty, or staff, the sudden displacement of students, the perception that a significant danger exists, or a large scale tragedy affecting the broader community. For example, past crises at BGSU might include the sudden death of a football player, a residence hall fire that resulted in the sudden displacement of students, or the presence of a stalker causing distress to residents of a dorm.

- (If YES)
  What kinds of public safety assistance did _______ (your unit/organization) contribute? (List the emergency situations the respondent listed in the earlier question. Inquire what members of unit contributed what types of services to what populations or groups). PROVIDE LIST

- (Continue if YES)
  If so, what other public safety units/organizations did you work with to provide assistance? (List organizations that unit has worked with in past disasters). (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

Responding to Campus Emergency/Disaster

Now I would like to describe a campus disaster situation and ask you to consider how _________ (your unit/organization) might respond.

Vignette One: On a weekday evening at 10:00pm in Jerome Library, an unidentified individual took two students and one staff member hostage in a small study room. At least one of the hostage students has been confirmed to be injured. Law enforcement officials have been responding and negotiating for twelve hours. It is currently 10:00am the next weekday and campus wide announcements regarding the situation have been made.

Imagine that _________ (your unit/organization) were asked to provide public safety services to the campus community in this situation.

What person or organization would be most likely to contact _________ (your unit/organization)? (Inquire what the name of the organization/unit is and the name of the person by whom the respondent would be contacted).
Would your organization be **willing** to respond to this hostage situation with public safety services?

Would your organization **have the capacity** to respond to this hostage situation with public safety services?

Please describe which individuals and what types of public safety services **__________** (your unit/organization) might contribute to this hostage situation? How would those individuals and services be mobilized?

If **__________** (your unit/organization) were asked to help provide public safety services in this hostage situation, what other on or off campus public safety units/organizations do you believe that you would likely be working with? *(Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others)* PROVIDE LIST

If **__________** (your unit/organization) was unable to provide all the necessary public safety services in this hostage situation, who else on or off campus might *you* contact for additional support and why? *(Invite respondent to list people and units/organizations both on and off campus that they would probably contact and provide a reason for the choice). (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others)* PROVIDE LIST

What plans, if any, are currently in place that would allow **__________** (your unit/organization) to respond quickly to provide public safety services in an emergency/disaster such as this hostage situation?

*(If respondent notes some disaster response plans)*

What possible limitations do you foresee arising that could impede your organization’s ability to implement these plans? *(If respond does not mention time and resource constraints, inquire whether or not these could be a limitation.)*

What specialized public safety crisis training, if any, have individuals in your unit/organization had that would help them to respond to an emergency such as this hostage situation?

I just asked you to **imagine** that your organization was asked to provide public safety services to the campus community in this hostage situation. Do you believe that your organization would actually be contacted in a situation such as this?

*Circle One*

No

Maybe

Definitely
Now I would like to describe a different campus emergency situation.

Vignette Two: On a weekday morning at 10:00am, a tornado touches down on campus, damaging a residence hall and the student recreation center. It is approximated that there are 50-75 deaths and about 200 people injured.

Imagine that ___________ (your unit/organization) were asked to provide public safety services to the campus community in this situation.

What person or organization would be most likely to contact ___________ (your unit/organization)? (Inquire what the name of the organization/unit is and the name of the person by whom the respondent would be contacted).

Would your organization be willing to respond to this tornado situation with public safety services?

Would your organization have the capacity to respond to this tornado situation with public safety services?

Please describe which individuals and what types of public safety services ___________ (your unit/organization) might contribute to this tornado situation? How would those individuals and services be mobilized?

If ___________ (your unit/organization) were asked to help provide public safety services in this tornado situation, what other on or off campus public safety units/organizations do you believe that you would likely be working with? (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

If ___________ (your unit/organization) was unable to provide all the necessary public safety services in this tornado situation, who else on or off campus might you contact for additional support and why? (Invite respondent to list people and units/organizations both on and off campus that they would probably contact and provide a reason for the choice). (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

What plans, if any, are currently in place that would allow ___________ (your unit/organization) to respond quickly to provide public safety services in an emergency/disaster such as this tornado situation?

(If respondent notes some disaster response plans)
What possible limitations do you foresee arising that could impede your organization’s ability to implement these plans? (If respond does not mention time and resource constraints, inquire whether or not these could be a limitation.)
What specialized public safety crisis training, if any, have individuals in your unit/organization had that would help them to respond to an emergency such as this tornado situation?

I just asked you to imagine that your organization was asked to provide public safety services to the campus community in this tornado situation. Do you believe that your organization would actually be contacted in a situation such as this?

Circle One

No       Maybe       Definitely

Reflections on Emergency Disaster Planning

I have asked you a number of questions about campus emergency disaster planning, and I would like to better understand your own feelings about the topic.

Is there anyone else from your organization or from other organizations on campus that you think we should interview? (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

Are you aware of any existing university wide plans for responding to a crisis or disaster?

• (If yes)
  Do you know if your unit/organization plays any role in the plan?

What do you feel are the most important things that BGSU should consider in developing and implementing an emergency disaster plan?

What kinds of things would have to happen for _________ (your unit/organization) to be able to quickly and effectively mobilize public safety services in case of a serious campus emergency or disaster?

What could the university do to assist your _________ (unit/organization) in emergency disaster planning?

Are there other things that you think are important for me to know about emergency disaster planning within your organization or on this campus? (Prompt for opinions to both organization and campus concerns.)

(Provide respondent with closing and anticipated next steps in the assessment and planning process.) Thank you for your time. This information will be used in my thesis and will be distributed to members of the network after it has been analyzed. It is my hope that this information can be used by organizations in this network to inform future planning efforts.
Appendix C

Disaster Response Network Assessment Questionnaire
For Communication Network

*Introduction*: As you know, our team is attempting to learn more about the communication system on campus during and after a disaster and the ways in which this system has been employed during emergencies or disasters. We hope to explore future options for coordinating available resources. We believe that the best way to get a comprehensive view of the system and accurately determine opinions of its leaders is to do face to face interviews. For this reason, we may be audio taping the interview for accuracy. Additionally, our questions are focused on the communication system on this campus in response to disasters. We appreciate your time in helping us to meet our goals.

As we begin, I would like you to think about disasters, emergencies, and crises in terms of large scale events that threatens to override the normal human capacity to cope.

*Background Information:*

I would like to start by asking a few questions about you and ____________ (your unit/organization). (For the remainder of the assessment, replace “your unit/organization” with the organization that the respondent is representing.)

Your position (job title):

Number of years in this position at BG:

Total number of years in/at ____________ (this unit/organization): (not necessarily total number of years at BG)

Your gender: M F Your date of birth:

We are interested in learning more about the communication network used by the university community that could/should be(or is) tapped in case of an emergency or disaster. Right now we are focusing on the communication system at BG. I will talking with you about a number of different issues and I want you to feel free to let me know if you have any questions as we go along.

I would like you to think about ____________ (name of unit or organization). In a campus emergency or disaster situation, what types of communication services do you think the ____________ (name of unit or organization) would be willing to provide? I have a list of different kinds of communication services you might want to consider.

In a campus emergency or disaster situation, what types of communication services do you think the ____________ (name of unit or organization) would be capable to provide?
Read the list of services and circle all that apply:

- Set up a webpage
- Give tv/radio/news interviews
- Coordinate communications between response agencies
- Provide facilities, telephone and computer access to response agencies
- Provide facilities, telephone and computer access to victims
- Reunite victims with families
- Give status reports to officials and response agencies
- Send e-mails to students and staff with instructions
- Send photos and videos to media and/or officials
- Troubleshoot when phone lines go down, cell phone signals are saturated, and/or the internet is down (ex. Getting lines rerouted)
- Keep communications systems and data accessible only to authorized personnel
- Other (describe)

(prompt respondent for the reasons why this service is unique).

Collect the card from the respondent.

We are interested in learning more about the capacity of ____________ (your unit/organization) to provide help during an emergency or disaster.

(Size of organization:)

About how many individuals, including faculty, staff, and students, in your unit are trained or qualified to provide some type of communication services?

How are these people trained or qualified to provide communication services in the event of a disaster?

About how many people in your unit would you envision helping to provide support assistance in the event of a disaster?

**History of Campus Emergency/Disaster Response**

(If at any time the respondents begin discussing off-campus emergencies, remind them we are interested in involvement on campus.)

In the past 3 or 4 years, can you think of any types of campus emergency or disaster situations where your unit/organization contributed some type of communications assistance? Examples of campus emergency situations could include situations involving the death or serious injury of one or more students, faculty, or staff, the sudden displacement of students, the perception that a significant danger exists, or a large scale tragedy affecting the broader community. For example, past crises at BGSU might include the sudden death of a football player, a residence hall fire that resulted in the sudden displacement of students, or the presence of a stalker causing distress to residents of a dorm.
Responding to Campus Emergency/Disaster

Now I would like to describe a campus disaster situation and ask you to consider how [your unit/organization] might respond.

Vignette One: On a weekday evening at 10:00pm in Jerome Library, an unidentified individual took two students and one staff member hostage in a small study room. At least one of the hostage students has been confirmed to be injured. Law enforcement officials have been responding and negotiating for twelve hours. It is currently 10:00am the next weekday and campus wide announcements regarding the situation have been made.

Imagine that [your unit/organization] were asked to provide communications services to the campus community in this situation.

What person or organization would be most likely to contact [your unit/organization]? (Inquire what the name of the organization/unit is and the name of the person by whom the respondent would be contacted).

Would your organization be willing to respond to this hostage situation with communications services?

Would your organization have the capacity to respond to this hostage situation with communications services?

Please describe which individuals and what types of communications services [your unit/organization] might contribute to this hostage situation? How would those individuals and services be mobilized?

If [your unit/organization] were asked to help provide communication services in this hostage situation, what other on or off campus communications units/organizations do you believe that you would likely be working with? (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST
If __________ (your unit/organization) was unable to provide all the necessary communications services in this hostage situation, who else on or off campus might you contact for additional support and why? (Invite respondent to list people and units/organizations both on and off campus that they would probably contact and provide a reason for the choice). (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others) PROVIDE LIST

What plans, if any, are currently in place that would allow __________ (your unit/organization) to respond quickly to provide communications services in an emergency/disaster such as this hostage situation?

(If respondent notes some disaster response plans)
What possible limitations do you foresee arising that could impede your organization’s ability to implement these plans? (If respond does not mention time and resource constraints, inquire whether or not these could be a limitation.)

What specialized training for communications during crisis, if any, have individuals in your unit/organization had that would help them to respond to an emergency such as this hostage situation?

I just asked you to imagine that your organization was asked to provide communications services to the campus community in this hostage situation. Do you believe that your organization would actually be contacted in a situation such as this?

Circle One
No
Maybe
Definitely

Now I would like to describe a different campus emergency situation.

Vignette Two: On a weekday morning at 10:00am, a tornado touches down on campus, damaging a residence hall and the student recreation center. It is approximated that there are 50-75 deaths and about 200 people injured.

Imagine that __________ (your unit/organization) were asked to provide communications services to the campus community in this situation.

What person or organization would be most likely to contact __________ (your unit/organization)? (Inquire what the name of the organization/unit is and the name of the person by whom the respondent would be contacted).

Would your organization be willing to respond to this hostage situation with communications services?

Would your organization have the capacity to respond to this hostage situation with communications services?
Please describe which individuals and what types of communications services ________ (your unit/organization) might contribute to this hostage situation? How would those individuals and services be mobilized?

If _______________ (your unit/organization) were asked to help provide communication services in this hostage situation, what other on or off campus communications units/organizations do you believe that you would likely be working with? *(Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others)* PROVIDE LIST

If __________ (your unit/organization) was unable to provide all the necessary communications services in this hostage situation, who else on or off campus might you contact for additional support and why? *(Invite respondent to list people and units/organizations both on and off campus that they would probably contact and provide a reason for the choice). (Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others)* PROVIDE LIST

What plans, if any, are currently in place that would allow ________ (your unit/organization) to respond quickly to provide communications services in an emergency/disaster such as this tornado situation?

*(If respondent notes some disaster response plans)*
What possible limitations do you foresee arising that could impede your organization’s ability to implement these plans? *(If respond does not mention time and resource constraints, inquire whether or not these could be a limitation).*

What specialized training for communications during crisis, if any, have individuals in your unit/organization had that would help them to respond to an emergency such as this hostage situation?

I just asked you to imagine that your organization was asked to provide communications services to the campus community in this hostage situation. Do you believe that your organization would actually be contacted in a situation such as this?
*Circle One*
No
Maybe
Definitely

**Reflections on Emergency Disaster Planning**

I have asked you a number of questions about campus emergency disaster planning, and I would like to better understand your own feelings about the topic.

Is there anyone else from your organization or from other organizations on campus that you think we should interview? *(Be sure to prompt for BGSU in-network, BGSU out of network, BG community, and any others)* PROVIDE LIST
Are you aware of any existing university wide plans for responding to a crisis or disaster?

- *(If yes)*
  Do you know if your unit/organization plays any role in the plan?

What do you feel are the most important things that BGSU should consider in developing and implementing an emergency disaster plan?

What kinds of things would have to happen for your unit/organization to be able to quickly and effectively mobilize communications resources in case of a serious campus emergency or disaster?

What could the university do to assist your unit/organization in emergency disaster planning?

Are there other things that you think are important for me to know about emergency disaster planning within your organization or on this campus? *(Prompt for opinions to both organization and campus concerns.)*

*(Provide respondent with closing and anticipated next steps in the assessment and planning process.*) Thank you for your time. This information will be used in my thesis and will be distributed to members of the network after it has been analyzed. It is my hope that this information can be used by organizations in this network to inform future planning efforts.
Appendix D

Participant Handouts
Public Health Network

In a campus emergency or disaster situation, what types of health services do you think your organization would be capable of providing?

Here are some examples to think about:

- Provide first aid on-site at disaster
- Provide larger procedures on-site at disaster
- Provide first aid at hospital/offices
- Provide larger procedures at hospital/offices
- Procure food
- Procure health supplies
- Track the use of health care resources
- Reunite victims with families
- Identify critically injured or deceased persons
- Estimate the number of injured and loss of life
- Provide materials and facilities for urgent health care
- Other (Please describe)

Please check each of the organizations that you have worked with in the past:

- [ ] Athletic Trainers
- [ ] Rec Center staff in "Fitwell"
- [ ] Wellness Connection
- [ ] Disability Services
- [ ] Health Center
- [ ] Public & Allied Health Program

Please list other organizations not listed that you may have worked with in the past. These organizations can be members of the BGSU community, BG community, or neither:
If your organization responded to one or more disasters in the past 5 years, please consider the level of involvement of your organization across all of the disasters to which your organization responded:

My organization played a major role in providing total supplies or equipment in response to the disasters.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
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</table>

My organization played a major role in providing staff and needed personnel in response to the disasters.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

My organization played a major role in dealing with the aftermath or post-disaster activities in response to the disasters.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
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</table>
Vignette 1:

On a weekday evening at 10:00pm in Jerome Library, an unidentified individual took two students and one staff member hostage in a small study room. At least one of the hostage students has been confirmed to be injured. Law enforcement officials have been responding and negotiating for twelve hours. It is currently 10:00am the next weekday and campus wide announcements regarding the situation have been made.

Please check each of the organizations that you believe that you might work with in this situation:

___ Athletic Trainers
___ Rec Center staff in "Fitwell"
___ Wellness Connection
___ Disability Services
___ Health Center
___ Public & Allied Health Program

Please list other organizations not listed that you believe that you might work with in this situation. These organizations can be members of the BGSU community, BG community, or neither:

Vignette 2:

On a weekday morning at 10:00am, a tornado touches down on campus, damaging a residence hall and the student recreation center. It is approximated that there are 50-75 deaths and about 200 people injured.

Please check each of the organizations that you believe that you might work with in this situation:

___ Athletic Trainers
___ Rec Center staff in "Fitwell"
___ Wellness Connection
___ Disability Services
___ Health Center
___ Public & Allied Health Program

Please list other organizations not listed that you believe that you might work with in this situation. These organizations can be members of the BGSU community, BG community, or neither:
Appendix F

Participant Handouts

Public Safety

In a campus emergency or disaster situation, what types of public safety services do you think your organization would be capable to provide?

Here are some examples to think about:

- Set up a parameter (barricade and put up signs)
- Allow/Deny access to the area
- Remove injured persons from the area
- Removal of debris from the area
- Assist in medical/first aid operations
- Communicate with media/public relations officers
- Assist in communication with other response teams
- Assist in the investigation (causes, suspects)
- Apprehend suspects
- Determine other potential hazards (collapse zones, presence of hazardous materials)
- Ensure maintenance of law and order (reduce panic)
- Collaborate/Lead evacuation procedures
- Assist with the transportation of victims (to home or to hospital)
- Assist in restoration/continued operation/redirection of utility services (water, wastewater, gas, and electric)
- Reunite victims with families
- Reunite lost or people without access to homes with their families
- Provide documentation of the damages (nature/severity/extents)
- Track the use of law enforcement resources
- Identify critically injured or deceased persons
- Estimate the number of injured and loss of life
- Estimate the dollar value of the loss
- Procure food, fuel, and/or health supplies
- Other (Please describe)
Please check each of the organizations that you have worked with in the past:
  ____ Transportation and Parking
  ____ Environmental Health and Safety
  ____ Facilities
  ____ Public Safety/Campus Security
  ____ Criminal Justice Department
  ____ Judicial Affairs

Please list other organizations not listed that you may have worked with in the past. These organizations can be members of the BGSU community, BG community, or neither:
If your organization responded to one or more disasters in the past 5 years, please consider the level of involvement of your organization across all of the disasters to which your organization responded:

My organization played a major role in providing total supplies or equipment in response to the disasters.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
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<th>Disagree</th>
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My organization played a major role in providing staff and needed personnel in response to the disasters.

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My organization played a major role in dealing with the aftermath or post-disaster activities in response to the disasters.

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Vignette 1:

On a weekday evening at 10:00pm in Jerome Library, an unidentified individual took two students and one staff member hostage in a small study room. At least one of the hostage students has been confirmed to be injured. Law enforcement officials have been responding and negotiating for twelve hours. It is currently 10:00am the next weekday and campus wide announcements regarding the situation have been made.

Please check each of the organizations that you believe that you might work with in this situation:

___ Transportation and Parking
___ Environmental Health and Safety
___ Facilities
___ Public Safety/Campus Security
___ Criminal Justice Department
___ Judicial Affairs

Please list other organizations not listed that you believe that you might work with in this situation. These organizations can be members of the BGSU community, BG community, or neither:

Vignette 2:

On a weekday morning at 10:00am, a tornado touches down on campus, damaging a residence hall and the student recreation center. It is approximated that there are 50-75 deaths and about 200 people injured.

Please check each of the organizations that you believe that you might work with in this situation:

___ Transportation and Parking
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Appendix F

Participant Handouts

Communication Network

In a campus emergency or disaster situation, what types of communication services do you think your organization would be capable of providing?

Here are some examples to think about:

- Set up a webpage
- Give tv/radio/news interviews
- Coordinate communications between response agencies
- Provide facilities, telephone and computer access to response agencies
- Provide facilities, telephone and computer access to victims
- Reunite victims with families
- Give status reports to officials and response agencies
- Send e-mails to students and staff with instructions
- Send photos and videos to media and/or officials
- Troubleshoot when phone lines go down, cell phone signals are saturated, and/or the internet is down (ex. Rerouting phone lines)
- Keep communications systems and data accessible only to authorized personnel
- Other (Please describe)

Please check each of the organizations that you have worked with in the past:
- ___ Marketing and Communications
- ___ Human Resources
- ___ Registration and Records
- ___ Residence Life
- ___ Student Affairs
- ___ Academic Deans and Chairs
- ___ Center for International Programs
- ___ Executive VP
- ___ Academic Affairs
- ___ Information Technology
- ___ Student Publications at BGSU
- ___ Interpersonal Communications Department
- ___ Department of Journalism
- ___ Telecommunications Department

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