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"Natural Disaster Plans and How They Need to be Fixed"

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Abstract

Natural disasters have affected our history, affect our present, and will affect our future. Because of this our world needs to adapt. But disaster plans already established should include certain aspects that would limit the amount of damage inflicted by the disaster and the number of lives that are lost. The problem with the literature is that it does not cover what should be done to decrease the number of lives lost and limit the damage that could occur. The first thing that it needs is disaster epidemiologists. These are scientists that go back into the history of the area and make a disaster plan based on the types of and the severity of the disasters that affect that area. Another thing that is needed is a disaster management plan that includes all the criteria laid out by E.L. Quarentelli. This includes all that is needed to have a smooth operation in regards to disaster relief. The last thing needed is not necessarily written down but should be understood by the people affected; it is a humanist approach to life. They need to know that cooperation is one of the most important aspects of disaster relief. Without it there could be chaos and the previous two requirements would be wasted. With all of this established a case study on the relief efforts after Hurricane Katrina was examined to see what went wrong with that relief and how these requirements would help with that.

“Natural Disaster Plans and How They Need to be Fixed”

Introduction

Natural disasters have been a part of nature since the beginning of time, from the eruption of volcanoes that spread gases throughout the atmosphere, to the earthquakes that shaped the planet to what we know it as today. Though in the past these disasters have helped create us and the world we live in, they often have a more negative effect on us now. From a tsunami that destroyed the coastline of Southeast Asia to an earthquake that destroyed what little the country of Haiti had. These disasters have the capability of setting countries back years, maybe even longer. When Hurricane Katrina hit the city of New Orleans in 2004, it left many homeless and a city underwater. Though that was 6 years ago, the city is still trying to get back to the way things used to be. And this is a city in one of the more developed countries in the world. Countries less developed take a bigger hit when they are struck by a natural disaster. The trouble with natural disasters is that they can either be unpredictable, as in earthquakes and flash floods, or they can be forecasted, as in hurricanes and tornadoes, but still bring a lot of destruction. The best way to help the population at risk is by preparing it for what can happen as well as making the necessary preparations for what is to come after because this is where more problems can arise. The distribution of resources may not be equal or some people may not receive any. A proper plan needs to be set in place to help everyone in any way they need it. When a proper plan is set in place with the help of disaster epidemiologists and appropriate disaster management, then more lives would be saved and there would be less damage to an area.

Before we go into what needs to be done about natural disasters, a distinction of what a natural disaster is should be made. Disasters in general are events that have a large impact on the

population affected. But this definition includes all disasters, both natural and manmade. *Natural* disasters are disasters that are caused by a combination of geophysical events and the human system that is affected. Natural disasters can be caused by hurricanes, floods, earthquakes, tornados, tsunamis, etc.; anything that affects a society but is mainly natural. As noted earlier, natural disasters have affected human civilization and have come in difference types. They all have different outcomes regarding the population affected. For instance, tornadoes bring a lot of damage in the form of wind damage, while hurricanes bring a mixture of wind and rain (Tobin & Montz, 1997).

Literature Review

Some of the literature on disaster relief does not really go into what needs to be done after an event has occurred. It describes what could happen after a disaster, specifically when it comes to the health of the affected population. For example, in the paper "Global Health Impacts of Floods: Epidemiologic Evidence", the authors described what could occur after a flood, from injuries and diseases, to even the mental health of those affected after the event has occurred (Ahern et al, 2005). Though it describes all that could happen, even going into detail on how they occur, it does not go into detail as to what a population should do to prevent these things from happening. Another paper essentially did the same thing. In the paper titled "Symptomatology and Psychopathology of Mental Health Problems After a Disaster," the authors went into detail on what psychological problems could arise after a disaster. They described the symptoms of certain psychological disorders that individuals could show after a disaster has occurred, such as post traumatic stress syndrome, as well as the impact these disorders could have on the population (Edna B. Foa et al, 2006). But again, did not go into what should be done to prevent

these disorders from occurring. Preventing them from occurring could benefit the population greatly.

A potential epidemic was the topic of a paper written in 2007. In the paper, titled "Epidemics after Natural Disasters," the authors, again, go into detail on what could occur after a natural disaster, in this case focusing in on the epidemics that could occur. They describe the problems that could occur after a disaster, from diseases that could be obtained from drinking water, to diseases that are vector-borne (Watson et al, 2007). But all it does is state this information. It does not go into detail on how to prevent these diseases, and a possible epidemic, from occurring.

Another paper researched the effects certain disasters had on populations. In the article, "60,000 Disaster Victims Speak: Part I. An Empirical Review of the Empirical Literature, 1981-2001," the authors went through historical data on how a population was affected and broke it down into the country the person was from, whether the person was a survivor or relief worker, the age of the person, and whether the type of disaster was natural, technological, or the result of mass violence. They then analyzed the data and pulled from it certain issues that could arise after a disaster, as in health issues, distress issues, psychological issues, and even issues only affecting youth. The authors broke down the data into various other categories, including the amount of impact the disaster had on the population (Fran H. Norris et al, 2002). This paper was very informative in regards to the effects disasters have on a population, but just like the other papers, it did not go into detail on how to make sure these issues do not occur.

This was a common theme and became a problem to me. Why, with all of this research, has no one tried to do something about it? Why not try to change the relief effort plans so that these issues do not come up again?

In this paper, I attempt to answer these questions based on two frameworks proposed by Quarentelli (1997) and Noji (1992) that do a good job of not only breaking down what the major natural disasters bring to a population, but what also needs to be done to prevent certain problems from arising, as far as management after a disaster and the research that needs to be done to help prepare for a disaster. The framework of a post disaster management plan would be based on one laid out by E.L. Quarentellli. It includes certain criteria that should be included in disaster management (Quarentelli, 1997). Eric Noji that disaster epidemiology and how it will help in post disaster plans (Noji, 1992). One sentence from a different paper, though, was what started this investigation into disaster epidemiology. In the paper titled "Global Health Impacts of Floods," the authors state that "This may in part be due to the difficulty of carrying out rigorous controlled epidemiologic studies of floods, especially in low- income countries" (Ahern et al, 2005). The point of this statement is to let the reader understand that if an epidemiological study were to be done on this subject, possibly to help create a proper post disaster plan, it would be difficult to do this in a low income area. The paper does not go into why it would be difficult, but one can imagine. There could be a number of reasons as to why the lower income areas would be difficult to do this type of data collection with, whether it could be lack of coordination or organization, or some other reason. The point that is trying to be made is that this statement by itself is a valid one, but when compared to the entire paper written by Eric Noji (1992) on disaster epidemiology, this statement gets a little confusing. Can epidemiological studies help a community or not? The key part of the statement is the subject of the statement "low income

countries." This is where a distinction needs to be made between the high- and middle-income countries, and low-income countries. When it comes down to it, right after a disaster everyone is experiencing the same thing. As times goes on after the disaster, though, the differences in social standing appear, as the group with the means do not take as much of a hit financially and are possibly able to move away from the disaster area. This forces those without the financial capability to stay in the area.

Disaster Epidemiology

Going back to the paper written to by Eric Noji, epidemiology studies can be done to further improve the post disaster plans of a country. According to Noji, epidemiological studies can not only help in post disaster plans, but they can also help in pre-disaster plans, specifically in warning systems and preparedness. In the paper, Noji also defines what a disaster epidemiologist is: someone who not only help assess those who could potentially be affected, create this disaster plan through research of past disasters, but they also monitor what is going on during and after the disaster to make sure there are no problems. If it is not, they will try to find the problem and help make it get to that. Some examples he provides are hurricanes Gilbert and Hugo, and an earthquake in California. In those disasters, the mortality rates were low, and were probably the results of a community that was excellently prepared, improvement in the public awareness, and, in the case of the earthquake, improvements in the designs of houses so that they are able to withstand the seismic activity (Noji, 1992).

"Disaster epidemiology evolved as a result of the increasing realization that epidemiologic methods can be used in studying the effects that disasters have on the health of populations" (Noji, 1992). These methods again help with the preparedness of a population in

both before and after a disaster strikes. These studies can help in the surveillance of a disasters, in the understanding of the public health impact of the disaster, an understanding of the acute health effects after a disaster through the help of historical data, data on the risk factors for adverse health effects after a disaster, evidence on how certain approaches to diagnosis and treatment impact the population, studies on the population to discover the long term effects the disaster has, identifying the psychosocial impacts on the population, and to evaluate the various types of assistance as well as the long term effects of aid in trying to restore the population to pre-disaster conditions. With the data that can be collected from these studies, appropriate warning systems can be designed and it can help create proper guidelines for preparedness training. Even though there have been advancements in the preparedness of disasters, more work is needed (Noji, 1992).

The Role of a Disaster Epidemiologist

Noji then goes into the process of what needs to be done by disaster epidemiologists. The role of disaster epidemiology includes many activities which include: quick assessment of the health needs of the population, surveillance and action oriented information systems, strategies for disease control for problems that are well defined, making sure that the use and distribution of health services is adequate, research on the causes of morbidity and mortality due to disasters, and the "development of long-term epidemiologic studies of the affected populations" (Noji, 1992). The last point is, in my mind, the most important. Disaster relief plans are more geared toward immediate responses, and do not take into account the long term affects a disaster can have on the population. The long-term effects can be as important as the short-term immediate impact a disaster can have on a population, specifically in the form on chronic illnesses and diseases. The paper on mental health problems written by Edna B. Foa et al in 2006 helped show

this. The mental health issues that arise can have long term effects on an individual, such as posttraumatic stress disorder.

The use of epidemiology in disaster settings was proposed early by Saylor and Gordon (Noji, 1992). They saw natural disasters as epidemics and that well-defined epidemiologic parameters should be used, as in place, time, and people affected to describe the natural disaster. But these applications were not used until the late 1960's, during the civil war that had erupted in Nigeria, when a large amount of international relief had been brought together to provide aid to the area. During this time, epidemiologists developed techniques to rapidly assess the needs of the population and surveys were created to find the populations that were in the most need. Because of this, public health workers realized the importance of epidemiological studies in disaster relief. They found that it was not impossible to study the health of populations by epidemiological methods and that there are common patterns of morbidity and mortality associated with certain natural disasters. During the data collection of sudden impact events such as earthquakes and cyclones, investigators used a variety of data collection strategies to study the post disaster health effects. With the help of descriptive epidemiology, a considerable amount of data have been collected through case studies of disasters that have occurred recently and disasters that have occurred more in the past. "Sufficient practical experience should now allow relief needs to be accurately determined after disasters involving nutritional deficiencies and displaced populations" (Noji, 1992, pg. 334). This means that with the proper methods of surveying, it can be determined where the aid needs to go and where the part of the population is in need of the most aid. The surveys may be straightforward and with the proper personnel and transportation, relatively accurate estimates of relief needs could be obtained quickly. "Problems may arise, however, with the interpretation of data, particularly in developing countries where

pre-disaster ‘baseline’ health and nutritional levels are unknown, and with the interpretation of incomplete data” (Noji, 1992, pg. 334).

Techniques to Help Disaster Epidemiologists

Over the years there has been the development of techniques to help disaster epidemiologists collect the necessary data they need to survey and assess the damage that has been done after a disaster. One method that has been developed is described in a paper written by Guha-Sapir et al (Noji, 1992). This method was a useful indicator to assess the needs of a population after an earthquake; a “quick and dirty” survey. This method has proved to be very useful, easy to use, and has shown the ability to collect data quickly after a disaster has struck. But during the last 10 years there has been a lot of attention paid property damage after an earthquake, and a method to estimate the property damage an earthquake could have in the future. This is not a horrible thing, but more attention should be put towards the estimation of the number of human casualties after a disaster, such as an earthquake, has struck. Only certain organizations who commission loss estimates, the ones who are responsible for people’s lives and safety, both in the private and public sector, are truly concerned about the loss of life. “The goal of disaster loss estimation projects should be to develop comprehensive casualty estimation methods that combine the most efficient and effective techniques with the most current theories and data” (Noji, 1992, pg. 334).

After a disaster has struck a population, the casualty estimation is probably the most important aspect of disaster planning. With estimation, the population will not only be able to assess which groups are the most vulnerable, but also be prepared in the event that there are casualties. The proper procedures can be in place to help those who are the most at risk, whether

it is to evacuate them and place them in a more secure area, or to provide them with the proper materials that can make sure that their risk will be reduced. Hospitals can also be prepared, whether in already established hospital buildings, or in hospitals that are in the field.

The research that will help improve the casualty estimation can also help in other areas, such as 1) planning guidelines that can be used in a realistic setting; 2) an improvement in the response programs after a disaster; 3) a better understanding and prediction on the affect a disaster can have in a specific subpopulation; 4)an improvement on the allocation of supplies, both medical and non-medical, to the population directly after a disaster has struck; 5) an improvement in the medical training, search and rescue, and self-help programs that can be of importance after a disaster, both in the short-term and long-term; and 6)an improvement in the disaster warning systems, as to inform the population of an impending disaster both quickly and accurately. The research can be very useful in many aspects of both a pre disaster and post disaster plan (Noji, 1992).

Problems That Could Arise

In past attempts to create disaster plans, specifically in estimating the number of casualties in earthquakes, problems have come up. The main problem is that there has been a lack of collaboration between different disciplines. This problem has hindered the past research that has described the health effects of disasters. An example that was given by Noji describes what needs to happen to have a pre disaster plan for an earthquake. Structural engineers need to assess the mechanisms of building failure during and after an earthquake, while the health workers need to provide the medical expertise to understand the process of injury that may arise during and after an earthquake because of the failure that may come up because of the

earthquake. Other collaborations need to be made and maintained to make sure that the population is prepared for a disaster (Noji, 1992). This would indicate that there is a need for inter-disciplinary research. This could lead to greater cooperation between the different organizations involved.

An important thing to note is that natural disasters are now viewed as a public health problem. This is very important because now further research can be done, especially in the health area of a disaster. During the last 20 years there has been evidence that shows disaster epidemiology is very useful in disaster preparedness, such as a decrease in the number of deaths after a tornado, as well as a decrease in the frequency of magnitude of measles outbreaks following a natural disaster (Noji, 1992).

Challenges of Disaster Epidemiologists

Noji goes on to discuss the challenges of disaster epidemiology. Problems can arise because of the political environment that epidemiologists have to work in to collect the data. Also, problems may arise due to the rapidly changing demographics and social changes. These problems can hinder the speed and effectiveness of data collection, delaying the assessment that is needed to know where the help is truly needed. The information that is the most important and critical is perishable and needs to be collected quickly. They include: “extent to damage to buildings, locations of where people are trapped, details about the victim extrication process used, and the quality of on-site medical care” (Noji, 1992, pg 336). These are very important and if not quickly collected, the information could be lost. There also needs to be a link between the information that is gathered by the epidemiologists during and after a disaster and the management that makes the decisions. The information that is gathered is very important to the

person, or people, who are managing the disaster relief. They need to know the amount of aid and relief supplies that are needed for the population, where to distribute the aid and relief supplies, and they need to know where the relief workers need to go. With the collection of data, there is improvement in decision-making on the manager's part. There is also an improvement in the predicting capabilities that the manager needs to face (Noji, 1992).

Phases of a Disaster

The phase of a disaster also needs to be taken into account by the manager. "Management decisions vary depending on the phase of a disaster. Similarly, which epidemiologic method is best depends on whether measurements are being made before, during, or after a disaster" (Noji, 1992). The 3 phases, as noted before, are before a disaster, during a disaster, and after a disaster. Before a disaster, epidemiologists need to focus on making sure that the at-risk populations thoroughly understand the situation and are prepared, assessing the amount of preparedness the population has and the flexibility of the surveillance systems that are already in place, and to make sure that the local emergency and public health personnel are properly trained and prepared. Also to be done before a disaster is the assessment of the at-risk populations themselves. Several factors are taken into account when assessing the risk of a population, such as assessing the capability of a structure and of lifestyle systems withstanding the disaster and be able to stay in place after a disaster. Structures include office buildings and residential buildings, and lifestyle systems include important public services, such as water, gas, and electricity, and health facilities. During the disaster, a couple things that need to be taken into account are the characteristics of the affected population and the emergency services that will be needed to that population.

During the post disaster phase, information needs to be gathered that describes the long-term rehabilitation and health services reconstruction of the population. There also needs to be information gathered on the effectiveness of health intervention programs. This can be done with the aid of epidemiological methods. Follow up studies are very important to make sure that the planning strategies for the future are improved, so as to reduce the morbidity and mortality rates associated with the disaster. But the disaster epidemiologists who are collecting the data need to go beyond just merely describing the impact on health that the disaster has on the population. They need to describe more analytical issues and the origins of certain relationships. The surveys that are to be collected need to be both detailed and specific, so that the proper interventions can be adopted. Since a standard survey can be modified to fit the specific disaster, data collection can be quick and be more efficient. “Remember, however, that the primary concern of disaster epidemiology is to improve decision-making by emergency response personnel and reduce the adverse public health consequences of disasters” (Noji, 1992, pg. 337). The problem that can occur with surveys deals with the speed at which the information needs to be gathered. The time after a disaster can become very hectic and the information needs to be gathered quickly.

This paper was very comprehensive and really broke down the epidemiology side of the issue. The main idea is to use epidemiological studies to help gather data and create a post disaster plan that is comprehensive and one that severely decreases the effects of the disaster on the population. With the proper information, not only can a proper post disaster plan be created, but a pre disaster plan can also be created. The data collected can help determine where the population needs to be evacuated if an evacuation is needed, what areas will be most affected, and what areas would need the most protection in regards to where sandbags need to be placed, and what places need a little extra reinforcement. This is where the literature that focused on the

issues and not a solution would help; those papers described in detail what could happen after a natural disaster. Disaster epidemiologists would obtain roughly the same information, but they would go a step or two further and utilize the information to create a disaster plan that prevents these issues from occurring. One thing that this paper does not go into is the distinction between the classes of people. This may be due to him not thinking about it or that there is no distinction. As stated before, right after a natural disaster goes through an area, the distinction between classes is wiped away and everyone has a clean slate. But well after the disaster, the families with the financial abilities recover more quickly. What should be taken from this though is the idea of disaster epidemiology and how it can be applied to post and pre disaster plans.

Disaster Management

But who is supposed to run everything? And what is this person or group of people supposed to do to make sure that things run smoothly and effectively after a disaster? Without any proper management, all the work done by the epidemiologists would be wasted because of the chaos that could ensue. This is addressed by E. L. Quarentelli (1997). In his paper titled *Ten Criteria for Evaluating the Management of Community Disasters*, Quarentelli goes into detail about certain criteria that is needed for good disaster management.

There are not really criteria of what a disaster relief effort should have. It is more of a way to evaluate the situation and make sure that the relief efforts are doing the best job they can possibly be doing. He begins by saying that although there is a relationship, managing and planning are essentially two different things (Quarentelli, 1997). This does not come as a surprise to some, at least it should not. When the words are broken down they are really not the same. Planning comes before a disaster. This is done so that the population at risk has knowledge of

what needs to be done before the event occurs, during the event, and after a disaster has occurred. This is normally done well in advance and past experiences can help with this. Managing is more of a job that occurs during the process of preparing. This is done when the event is imminent and things need to be done. In this case, there is someone who is managing the situation and making sure that the whole thing is going as planned. This can be undertaken in advance but is normally done before the event is about to occur, making sure that the population is properly prepared, limiting the damage that occurs. Managing also occurs during an event, making sure that things are still going as planned and nothing occurs that is out of the ordinary. It also occurs after a disaster. This is where managing is at its most crucial state, when things can get very chaotic and when there needs to be someone, or a group of people, overlooking this whole process. Quarentelli, provides a list of criteria that helps to evaluate a management plan and helps determine if it is a good one. A couple of things he says though are very true, and are very interesting. He talks about strategy and how important it is to a disaster preparedness plan.

There are certain things though that are specific to each situation and need to be addressed, and are called tactics in military terms. So he then states that, “thus, if we think in parallel terms, we can equate good disaster preparedness planning with the best strategy that could be followed in readying a community for a sudden disaster, while good management involves the use of the best tactics for handling the specific contingencies that surface during the emergency time of a particular disaster” (Quarentelli, 1997 pg. 40). This is important to what we are trying to do here, which is to create a disaster plan that can be general to some degrees and specific in others. Preparedness, then, helps the community get ready for an impending event. Management, on the other hand, is something that occurs right before, during, and especially after a disaster. Management needs to be ready for all the little specific things that can occur with

each disaster. It also needs to be ready for other things that are not specific, but can occur after a disaster. This is where epidemiology comes in handy. Through research, a team of scientists can go through the history of an area and determine what disasters have occurred in that area. Then they can be more specific and look at individual disaster types. That way the preparedness plan can be ready for them. One thing that he also says in that what is crucial is not just the presence of management, but there needs to be good management (Quarentelli, 1997). Just because there is someone or a group of people managing a situation does not mean it is moving in the right direction. There needs to be good management. This is what is needed to make sure that the community gets back to where it needs to be.

One major factor that can occur is the social factor. An example used by Quarentelli tells of a town in China that was never the same socially after a major earthquake had hit. This is something that should not occur. This was used to show the contrast in preparedness between two different areas affected by very similar events. The other event that was described was an earthquake that had hit the Northridge area in California. This earthquake, just like the one in China was a major one. But the difference between these two events was that the two different communities had different results after the event. The community in China never was able to get back to where it was before the natural disaster, but this is not what happened in Northridge. The community was able to get back to their every day habits, the very next day after the earthquake (Quarentelli, 1997). There needs to be a plan set in place so as to help with the long term effects of a disaster and to make sure that the community is brought back to where it was before the disaster occurred, but a little modified. The community before the disaster was vulnerable to the disaster that occurred, so building back to where the community was before the disaster would

keep the community at risk. What should be done is take into account the weaknesses in the community that were exploited during the disaster and improve upon them.

Disaster Planning and Management

The main concern of Quarentelli's paper is community disasters. Disaster in communities can be devastating and there needs to be a plan implemented that can limit the impact these disasters have on the community. Quarentelli covers both preparedness planning and good disaster management. He does not go as in depth about planning as he does about management, as he only makes a list of certain things that must be included in a preparedness plan. There are a few that really caught my attention and I thought they were more crucial to a preparedness plan then the others. The first point is that a preparedness plan "highlights a continuing planning process rather than the production of an end-product, such as a written plan" (Quarentelli, 1997, pg. 41). This is important because natural disasters are not all exactly the same, even ones that are of the same geophysical event, as in a tornado in Nebraska and a tornado in Missouri. They may seem to be the same disaster but they truly are not. Each disaster has its own different factors and effects they have on the community, and because of this there should be a plan that is fluid enough, or have different components so that it can keep up with the different effects that a natural disaster may have. The next point that caught my attention was the one that states that a preparedness plan should adopt, "multi-hazard rather than single-hazard focus, and generic rather than agent specific," approach (Quarentelli, 1997, pg. 41). This is also important but I slightly disagree with this statement. Yes, a preparedness plan should have some aspects of a generic plan, but it should also have aspects of a specific plan. This goes with the statement that I was just talking about. Though two tornadoes may seem the same, they are not. This is why a plan needs to be specific to some degree, or at least fluid enough to where it can encompass all of the

different factors and components that a natural disaster can bring. It should not be something that is too generic. But the generic side comes into play when you start talking about certain parts of the preparedness plan, as in evacuations. For the most part the evacuation procedures are going to be the same for most disasters; because the people of the same area are going to be vulnerable, the evacuation would be similar. Differences that could arise would be where they evacuate. Some people may have the financial capabilities to move out of the area, while those without the capabilities would have to go to local shelters and other buildings of refuge.

The next point that caught my attention was the statement that a preparedness plan has to "build on the notion that what is needed is a model that focuses on the coordination of emergent resources, rather than trying to impose some kind of command and control" (Quarentelli, 1997, pg. 41). I do agree with the part about coordination, but I do believe some level of authority is needed. There definitely needs to be an organization that is in charge of the management aspect. There were other points that caught my eye, but these are just the preparedness part of a natural disaster.

The crucial and the most dynamic part of a plan is after a disaster has hit. This is where a plan needs to be specific to the individual disasters. Quarentelli lays out the ten criteria and explains each of them in detail:

- Recognize the difference between agent- and response-generated needs and demands
- Carry out generic functions in an adequate way
- Mobilize personnel and resources effectively
- Involve proper division of labor and task delegation

- Allow the information to be adequately processed
- Allow for proper decision making
- Focus on the development of cooperation
- Blend emergent characteristics and groups with already established ones
- Provide appropriate information to the masses
- Have a well functioning Emergency Operations Center (EOC)

Agent-Generated vs. Response-Generated

The first is that a good disaster management plan must be able to recognize correctly the different between agent- and response-generated needs and demands. This is something that each disaster must be able to differentiate. This means that a plan needs to be able to indicate which needs and demands are ones created by the disaster itself, or whether they are created by the effort that is done trying to organize a response to the disaster. “Agent generated needs will vary considerably depending upon the disaster impact and the specific nature of the agent” (Quarentelli, 1997, pg. 42). For example, a flood may generate the need for sandbags to keep the flood waters at bay. Or firemen may need to be prepared for fires that may be caused by a tornado to earthquake. These are things that are specific to the disaster itself and are created by the disaster. On the other hand, response-generated demands are not as specific. They are “common to all disasters because they are produced by the very efforts responding organizations make to manage community disasters” (Quarentelli, 1997, pg. 42). These, again, are not as specific, and since they are common to natural disasters, they can be planned for.

Included in a disaster plan can be a section on what might go wrong or what is needed under different scenarios. They can be approached in a more strategic way before a disaster even

hits the community. This cannot be said for the agent-generated demands. These need to be approached in a more tactical or contingency way, and can only be prepared for partly. The preparation aspect of that statement can be fixed with epidemiology. Through the research, one can prepare for more things that could happen during or after a disaster that is created by the disaster itself. The history of the area and how past disasters have affected it can really show a researcher what can happen. This way, the community can prepare for it in the proper way, and be able to manage in a way that can be very effective.

Carry Out Generic Functions in an Adequate Way

The second point that needs to be considered when a management plan is created is that the plan needs to carry out generic functions in an appropriate and effective way (Quarentelli, 1997). The effective way is the important part, in my eyes, of the statement. As Quarentelli stated before, it is not just management that is important, its good management. This goes along those lines; just because there may be a generic plan for a disaster relief plan that covers a lot of aspects of a disaster, it does not mean it is going to help and be effective. This is one crucial point. Again though, as stated before, generic functions are important as some aspects of a disaster are common among most, if not all disasters, but there needs to be some specific aspects of a disaster plan to meet the needs of disaster effects that are specific to that disaster itself. Quarentelli uses a quote from Perry (1991) that really sums up what a generic function is. It reads:

> "Generic functions are actions or activities that may be useful in various disaster events. Evacuation, for example, may be needed in floods, hurricanes, volcanic eruptions, nuclear plants accidents, or hazardous materials incidents. Generic

functions are developed and planned in the pre-impact phase, *although some decisions will have to adapted to the situational demands*" (Quarentelli, 1997).

This is important because it shows what exactly generic functions are. There is a short list that Perry draws up that includes functions and actions that are common to disasters: warnings, evacuation, sheltering, emergency medical care, search and rescue and protection of property. These are the common functions that can be applied to all disasters. It is probably going to be rare to find a natural disaster that does not include most of the criteria listed. The only exception would be sudden onset disasters which lack the ability to give a warning, such as an earthquake (Quarentelli, 1997). I agree with this list. It would be very hard to find a disaster that does not include all of these, as mentioned before. If you go through all of the natural disasters throughout history, you would find some form of all of these and to be honest, there could possibly be a warning system setup for earthquakes. It would be great if an accurate one could be found, since there are some seismic activities that can help determine when an earthquake will hit. Quarentelli includes other actions that could be added to the list. They include: mobilizing emergency personnel and resources, assessing the damage, coordinating emergency management activities and restoring public services (Quarentelli, 1997). I do not disagree with this list, and I actually think this list may be as important, if not moreso, than the first list. Both lists, for the most part, include aspects of disaster relief that could be predetermined, possibly well before the disaster has struck. With proper epidemiological data, evacuation routes, shelter locations, where emergency medical care is going to be needed, information on how to protect property, and even warnings can be determined. The only things that could be difficult to accomplish before a disaster has hit would be to know where to send search and rescue teams, assess the damages, and to know which public services need to be restored. The second list includes authority, which

is important during the chaotic time after a disaster. This is also something that can be determined before a disaster. The person or group that is to be in charge of the relief efforts should be known in advanced.

Mobilize Personnel and Resources

The third criteria that should be looked at is that a management plan should be able to mobilize personnel and resources effectively. There needs to be a plan on how to make sure that the personnel that are going to come in and help with the aid and distribution of resources know where they are going to go and know what they are doing. The resources also need to be able to get the population in need in an effective way. If this is not done, an entire community may be without help, which could lead to more deaths. During the time after a disaster in the United States, there is normally enough aid available to make sure that the relief work is done properly. The only problem is when they do not know what they are doing or where they should be. This poor effort in planning could lead to a problem, where you have all of this help but do not know what to do with it. So though you may have a mobilization of resources and volunteers, there is no guarantee that it is going to help. An effective mobilization of resources and volunteers is what is needed. Again it goes back to what was said earlier about good management. Just because you have a mobilization of aid does not mean it is going to be an effective one and will help out the population in need (Quarentelli, 1997). But this is based on the premise that there is enough resources. This may not be true all the time. If there is not enough aid, then the distribution aspect would not be the problem, it would be the lack of resources.

Delegation and Division

The fourth point that is made is that there needs to be proper task delegation and a division of labor. This can be a problem immediately after a disaster (Quarentelli, 1997). The reason being is that people are killed or injured, buildings are destroyed, all people may have evacuated. So with all of this possibly happening, there may be confusion as to who is doing what. This needs to be addressed immediately after a disaster. There can be a general structure and there should already be people in place to start with the recovery. I am not saying to bring in all new people to help with the recovery. I am saying that initially there should be people who are prepared to handle the situation in the area, and start the recovery. Then after the initial recovery is ongoing, bring in people from the community who can help. These are the important people. These are the people who lived in the area that was affected. They are the ones who would really want the area to get back where it should be. We should not just ignore them. They should be included in the help.

Information Processing

The fifth point that is need is adequate processing of information. A problem in disaster relief is not the fact that there is a lack of communication, but what is communicated. More attention is paid to making sure that there are enough modes of communication, which tends to take away from what is said. The miscommunication occurs between organizations, within organizations, or between citizens and organizations. This stems from a combination of the lack of information processing and the increased flow. After a disaster, there is an increased amount of individuals that are using the means of communication. For example, after a disaster, large amounts of people may be using the radio airwaves, possibly clogging up the airwaves and

slowing down communication. The system may not be able to accommodate this and can overload. What needs to occur is a clear chain of command so that the information can run smoothly from top to bottom. But a problem could occur because of the complexity of flow after a disaster. This could arise from either too many people doing one job, someone doing a job that is out of his/her normal routine, and someone who is doing a job that is temporary and with which he/she is not familiar. This can hinder the delivery of information and can cause even more problems (Quarentelli, 1997).

Appropriate Decision Making

The sixth point is that there needs to be appropriate decision making. It is not common to find a breakdown in authority or have officials leave their positions, or even see a group's authority challenged. But that does not mean there are not any problems. The decision making itself can be affected in a negative way by the disaster. Common problems include loss of upper level officials because of overwork, conflict over new responsibilities, inability to agree on organizational domains between the already established groups and the new groups that have been created by the disaster, and differences between the jurisdictions of organizations. The first comes from officials working too long, leading to exhaustion, and eventually bad decisions. When they are replaced, the new officials may not be able to make the proper decisions because nothing was recorded properly. When a new task is needed, there is a conflict as to which organization should be in charge of it, which can lead to the second problem. Certain tasks are not designated for already established organization, which can lead to no or poor decisions. This could then cause problems between the established and emergent organizations. If bad decisions are made, a conflict can arise between the groups, especially if the tasks are traditional tasks. An example used by Quarentelli would be the task of area security which is normally done by the

local police. But after a disaster has occurred, non-local police or army personnel may come in and try to provide security. This can create a conflict between the local police and those who try to move in and do their job. The last problem that could arise occurs when there are no clear distinctions between the jurisdictions of organizations. After a natural disaster, there could be a problem when there are no clear distinctions as to what the responsibilities are for the various organizations that are involved (Quarentelli, 1997).

Overall Coordination

The seventh point that should be included in good disaster management is the focus on the development on overall coordination. This point would help solve the problems that could occur in appropriate decision making discussed above. With the chaos that ensues after a disaster, and with all the decisions that need to be made, there can be a lot of confusion that is created. One would think that there needs to be one person or organization that takes control of the situation. But according to research, it would not be smart to employ such a practice. Actually it could prove impossible to have one person or one organization control everything in that way. When the word coordination comes up in a normal conversation, one thinks of people working together, but during the time after a disaster, the meaning of this word can be different between the people involved. Some think it means telling others what needs to be done, others see it as one group controlling everything. Another group sees this term as what it should be, mutually cooperation on carrying out tasks. With all these different interpretations of the word coordination, problems will occur, even when there is an already post disaster plan in place. Problems with coordination also occur between organizations that are involved. This stems from the fact that the private organization and public organizations have different interests when the population is involved. Problems could also occur when you have different organizations

working on the same common task that are new. Even groups that have worked together before can encounter difficulties when they work together on a new task (Quarentelli, 1997).

Emergent vs. Established

The eighth criterion is a combination of emergent activities with already established ones. After a disaster has occurred, new activities will arise. These include search and rescue, damage assessment, and the distribution of relief and supplies. If a new task cannot be accomplished the usual way, a new way should be found. If new problems arise, an effort will be made to accomplish this new task. Problems do occur, though, when something comes up that the disaster planners did not anticipate. Every possible event should be taken into account and planned for. Another problem that needs to be fixed is the idea that any new problem that occurs that is not planned for is a bad thing. On the contrary new tasks and new groups that do these tasks can help and are effective in solving the problem (Quarentelli, 1997).

Mass Communication

The ninth criterion that is needed in good management is the ability to provide the mass communication system with appropriate communication (Quarentelli, 1997). Mass communication is an important aspect in an industrialized society, actually in any society. What should occur is cooperation between the managers of the relief effort and those involved in informing the population on what is happening. When the relationship between the two is fine, then both parties are happy; reporters get the story they want and the managers produce information that the populous needs to know. Because of the cooperation, the population in turn receives the information that they need to stay informed about the disaster. If this cooperation is not maintained, the population would not be informed as they should be. Even the population

that is affected can benefit from the mass communication. They would be informed as to what hazards could have arisen because of the natural disaster. And with the advancements of the technology in today's society, mass communications could occur with much more efficiency (Quarentelli, 1997).

Emergency Operations Center

The tenth criterion that is needed is to have a well functioning Emergency Operations Centre (EOC). With the decisions to be made, tasks to be delegated, and information to be processed, among other things, there needs to be a centre of command, somewhere where all of these things will be done. This is where the EOC comes in. A fully staffed EOC could help considerably with the flow of information between the various organizations. It needs to be fully equipped with the various technologies that are needed to make it efficient. But an important thing that is needed from each organization is a liaison between the EOC and organizations. If this is done properly, there is cooperation between everyone involved, and there may be access to important technologies. With this cooperation already in place, then the rest of the characteristics are unimportant, as in where the EOC is located to how it is socially structured. Even conflict that arises vertically or horizontally would have minimal effect on the EOC if there is effective organization (Quarentelli, 1997).

A Humanist Approach

Two of the more important aspects of a proper disaster plan have been covered: disaster epidemiology and disaster management. But there is another aspect of a disaster that has not been covered and that is the human aspect; the raw human emotion that is shown after a disaster has occurred. This can range from cooperation between the population of a community to

complete chaos. One thing that I have been made aware of is how the society of an area can affect the distribution of aid. The example was in Bangladesh, after a tsunami had hit. Because of the religion in that country, the aid for the affected population was not distributed equally. The men in the population received the aid while the woman had to wait for theirs or did not receive any at all. I disagree with this on many levels. First women and children should receive aid first, or get most of it, if there is going to be an unequal distribution of aid to the affected population. And second, there should not be an unequal distribution of aid in the sense that one group receives more than the others because of some reason, whether it be because of the color of the skin of certain groups, the gender that a certain group has, or even the religion they follow.

A common quote taken from the Declaration of Independence written by Thomas Jefferson states that "All men are created equal;" even though this was written in the Declaration of Independence of the United States of America, this quote can be applied to many different countries in many different situations. This is important when aid needs to be distributed after a disaster as everyone should have access to all the help they need, from food and water, to the most basic medical needs and resources. They should have an equal chance at receiving them. It should not matter where you come from or where you have been, or who you know or who you do not know. Everyone should have an equal chance at the help they need. The incident in Bangladesh occurred because of the religion. Now this is important because religion is important in some cultures. During the research of a particular area, a disaster epidemiologist needs to take into account the religion in the area. This is so that the aid and relief workers that come in and help do not disrupt something they are not supposed to disrupt or do something they are not supposed to do. Relief workers are only there to help, not disrupt. For many on this planet, religion is important and the disruption of their way of life in a negative way can have a huge

impact on the way the aid is disrupted, and can put in danger the relief workers and cause a mess that is not needed. A mess would only delay the distribution of aid to those that are in dire need. But if a religious practice interferes with what the relief workers are trying to accomplish, there needs to be cooperation between the groups involved so that the aid can be given out without any interference.

Now that it has been established that different types of disasters require different types of aid, lets continue the conversation about how every man, woman, and child is created equally. As noted, all men are created is a phrase has been used in different settings, and I would not be surprised if it was used during the time of equal rights, for both when women wanted equal rights, and for when African Americans, and other minorities, wanted to be treated equally among their white counterparts. But the basic idea was repeated in what is called the Humanist Manifesto. This is a document that was written in the early 1940's and looked at again and revised in the 1970's. Basically what the document is saying is that we are all human. After you take away all of our culture and religion and values, we are all the same. During the first writing on the Manifesto, there were 15 points that were made. Now it does not say that we should not be religious at all and throw religion out the door; nowhere in the document does it say that. What it does say is that there should not be a certain religion that man believes in and that there are some important aspects of life that should hold true.

The Points of Humanism

Now though there were 15 points, only a few of them are relevant to this paper, so those are the ones that will be focused on. The fourth and fifth points will be focused on first. The fourth point states that a person's religious beliefs and culture are shaped by a process that is a

gradual development based on the populations interactions with the natural environment and the social heritage. “The individual born into a particular culture is largely molded by that culture” (Humanist Manifesto, 1933, pg. 1). Culture has a huge influence on people, from the values they hold to their religious beliefs. The fifth point states that:

> “Humanism asserts that the nature of the universe depicted by modern science makes unacceptable any supernatural or cosmic guarantees of human values. Obviously humanism does not deny the possibility of realities as yet undiscovered, but it does insist that the way to determine the existence and value of any and all realities is by means of intelligent inquiry and by the assessment of their relations to human needs. Religion must formulate its hopes and plans on the light of the scientific spirit and method” (Humanist Manifesto, 1933, pg. 1).

This is a long quote and it needs to be broken down. The first part says that the way we look at the universe and understand it leave little room to believe that there is a God and the other beliefs that religion has explained to us. It goes on to say that though humanism does not deny the existence of these things, the way we look at things and discover them is by intelligent thinking and research, trying to determine their link to us as humans and the needs that require satisfaction. Religion needs to determine our needs and be able to satisfy them.

The seventh point states that religion encompasses everything that we humans include in our everyday life, from the actions, experiences, and purposes that we go through every day, to even the thoughts that we have; basically everything that satisfies us in an intelligent way. “The distinction between the sacred and the secular can no longer be maintained” (Humanist

Manifesto, 1933, pg. 1). Meaning that things that are sacred are becoming more and more religious based.

The eleventh point that is made is another interesting one. It states that, “man will learn to face the crises of life in terms of his knowledge of their naturalness and probability. Reasonable and manly attitudes will be fostered by education and supported by custom. We assume that humanism will take the path of social and mental hygiene and discourage sentimental and unreal hopes and wishful thinking” (Humanist Manifesto, 1933, pg. 2). The whole point of the paper is to encourage humanism, and in terms of natural disasters, this point is very significant. In the face of a natural disaster, a person will assess the situation, from how much he/she can control it (the naturalness) to the probability that the event will occur. Then after assessing the situation, he/she will try and formulate a plan of attack, which will be created based on what the person has learned in the past and the customs that they are familiar with in their society. When it comes down to it, a person will usually want to do something about the event, and make sure they come out of it alive. They will sometimes leave their emotions out while trying to figure out what to do, and they will also not rely on unreal hopes and wishful thinking. They are not going to just sit there and hope for the best. As a person is faced with the challenge of a natural disaster, they are going to try and do everything they possibly can to make sure that the outcome of the event is a favorable one, in the sense that the damage done is small, and that they come out of it alive and well, while leaving emotions and irrational thought out of it.

The problem with this thought is that this may not always be true. You may find people who sit there and do not do anything, whether it is because they are traumatized by the event, or they are praying to his/her god. This can create more of a problem in the sense that this one person that is doing nothing can put the lives of others in jeopardy. For instance, when a mother

is in the middle of a natural event, she may choose to do nothing and pray, potentially putting the lives of her children at risk.

The manifesto goes on to talk about a couple other things. But the fourteenth point is one that I want to focus on some more. The first part talks about how a society that is profit-motivated has failed in some sense in today's world. It then goes on to say, "a socialized and cooperative economic order must be established to the end that the equitable distribution of the means of life be possible. The goal of humanism is a free and universal society in which people voluntarily and intelligently cooperate for the common good. Humanists demand a shared life in a shared world" (Humanist Manifesto, 1933, pg. 2). This was probably written to apply to the setup of the economic structure of a society, but if you think about the statement, it could be applied to the relief efforts after a natural disaster. The first sentence talks about a socialized and cooperative economic order and how this must be established so that the proper resources for life can be distributed equally. The big word to me is cooperative. This is a crucial part of a relief effort. Everyone needs to be on the same page and needs to cooperate for a proper relief effort to be undertaken. The socialized part as well holds some importance. Socialism has received a lot of connotation in the past. But in this scenario, it would not be as bad. In this sense socialism would be used to divide the labor and use the people who are present as the workers. It really does not sound too bad. Only part of what socialism is would be applied here. The whole thing is not necessary.

The next sentence of the statement is also important, especially the part about the people voluntarily and intelligently cooperating. In a time of need, especially after a natural disaster, there needs to be cooperation, as previously stated, but there also needs to be people being smart about their actions and for them to volunteer. After a natural disaster, things are going to be very

chaotic, with the instability of the society to the fast approaching aid and relief. Things will get a little crazy. But the people who are affected need to be able to come together and help with as much as they possibly can. But they need to do so intelligently. Time is of the essence in these situations and there needs to be people who not only want to help, but can do so effectively. The last sentence in the quote really is something that shows why we need to cooperate and help each other out. This is really a shared world. No one really owns anything. We need to help each other out to get through this obstacle course we call life. No one is able to get through it by his/herself. We need each other's help, especially when there is a crisis or in a time of need, and to be honest, a disaster can count as both of those.

The last point that is made talks about what humanism will do. It focuses on 3 points, all of which can be applied to a post disaster relief effort: a) Humanists will affirm life rather than deny it. This is a crucial point. During a post disaster relief effort, there are going to be lives that are hanging in the balance between life and death and you have others that seem to be lost but with a little effort could be able to pull through. By helping everyone that is affected, it shows that every life is viewed with the same value. People may argue that certain lives are more important than others. I do not believe this. Lives should be looked at equally. One life is not worth more than another's. When it really comes down to it, we are all the same. b) Humanists will seek to elicit the possibilities of life, not flee from them. This next point may not be easily linked to a post disaster relief effort but it can be done. Rather than throw out the possibility of life in certain areas that have been affected by a disaster, the relief workers should search for survivors as if there will be survivors everywhere. Just because a place looks discouraging, that does not mean there is no hope at all. c) Humanists will endeavor to establish the conditions of a satisfactory life for all, not merely for the few. This goes back to what I was saying about the

lives of people being equal and that no one person is better than another. During a relief effort, the lives of those affected need to be treated equally and when the aid is brought to the area, the lives of all the persons affected need to be satisfactory for all. This can also be applied to after the immediate relief, when the long term help comes. Since the immediate relief is not the only relief that is going to be applied here, we need to look at how this affects long term aid. This is what we want to do. Not only try and bring the lives of people back to how it was before they were affected by the disaster, but try and do it equally.

Going back to the example that about in Bangladesh, how are the people supposed to be helped in that situation? Only men were being helped because of how the religion is setup there. Again, the lives of all people are equal and should be treated in that way. The manifesto goes on to say how humanist's efforts will flow with the help of positive morale and intention. It then goes on to say that though the religious efforts of our forefathers are no longer adequate, the central theme of helping mankind is the same. It goes on to say that humans are starting to realize that they are the true controllers of their lives and that they are the ones that are going to get those dreams.

For a proper disaster plan, there needs to first be a group of epidemiologists that look at the history of an area and see what natural disasters have occurred in the area. Then with the data that they find, they create a proper pre- and post-disaster plan. Then a proper disaster management plan is created. This would include all of the criteria from Quarentelli as well as incorporating the local disaster relief help that is already established in the area. All of this information should be disclosed to the public as an attempt to educate the population about disaster relief and the plan that will be implemented when a disaster occurs. During this time, the population will be informed about what cooperation can do in a time of relief and how during

this time, everyone is equal and certain limiting factors, such as religion or social class, should be thrown out.

A Case Study: New Orleans

Now that we have established what needs to be included in a disaster plan, there needs to be an event that can be investigated to see if any of the above characteristic found in the research are included in what occurred before and after the disaster. The event that will be investigated is Hurricane Katrina. What occurred after Hurricane Katrina has been controversial, and because of this it should be a good event to investigate. Just by looking at the timeline of Hurricane Katrina, good things and bad things can be seen. During the months before Hurricane Katrina hit, the Federal Emergency Management Agency (FEMA) did exercises around Lake Pontchartrain to test the levee system that surrounds the city. They assumed a Category 3 hurricane with 120-mph winds would hit New Orleans and created a theoretical model as to what would happen. They assumed that a storm like that would breach the17.5 feet tall levees and the about 87% of the homes in New Orleans and most of the city's population would not be able to evacuate and would be left trapped in and on top of their homes. Days before Katrina hit, warnings to New Orleans, the state of Louisiana, and the surrounding states were given about the impending devastation. The mayor called for the city to be evacuated, but this came 20 hours before Katrina hit. On Monday, August 29, 2005, Hurricane Katrina made landfall on Louisiana at 6 a.m. About 5 hours after Katrina made landfall, FEMA director Michael Brown requested more volunteers for the area and called the event catastrophic. Over the next few days, water continued pouring into the city.

Throughout the whole time rescuers looked out for people and the city was being cleaned up, the whole country was watching this occur on their televisions. Reporters went into New Orleans and presented their findings to the public, even conducting interviews to get the full story. Throughout the whole recovery process, problems arose, from people not having enough food, help, and being denied access to the city. Looting started to become a major problem since a lot of the businesses and homes were abandoned by the storm. Citizens in the convention center did not get supplies until days after Katrina hit. The President continued to order for more help in the relief effort. An outside company was brought in to help with the collection of bodies, but there was a disagreement as to who should pick up the bill: state or federal government. Brown was removed from managing the relief effort, and eventually resigns. The president took over control of the relief efforts (Factcheck.org).

The first problem that occurred was what happened before the hurricane even made landfall, during the exercises. The theoretical models on the levees showed that they were susceptible to breaching. This is a major problem. What makes it worse is that the winds in the model were only 120-mph, but there have been documented accounts of hurricanes with higher wind speeds. Since 2000 there have been 8 hurricanes with winds 160-mph and up; hurricanes classified as Category 5. Testing the levees is a good thing, but by not using the information that is gathered from these tests, lives were put at risk. This is what disaster epidemiologists would have done; they would have done the research and run the theoretical models to test the vulnerability of the area. But they would not have stopped there as they would have taken it a few steps further and would have created a plan specifically for the area, from evacuation routes, buildings for shelter, and even deciding how resources might be distributed. They would have

even done what they could to get those levees changed so as to reduce the risk that could have occurred should a strong hurricane have hit.

The day before Katrina hit, NOAA estimated that the storm surge from the hurricane would be 18 to 22 feet tall. The levees, as already mentioned, were 17.5 feet tall, so they would not be able to withstand the estimated storm surge. And that measurement is not consistent all the way around; there aware some places that were lower than that. Did they really think a problem would not come up with these levees? Later it was concluded by engineers that the failures of the levees were due to the instability of the foundation soils under them. But it was also concluded that the "performance of many of the levees and floodwalls could have been significantly improved" and that they could have been fixed with relatively inexpensive modifications (factcheck.org). Again, all of these problems would have been fixed by a disaster epidemiologist.

Another problem that occurred was the timing of the evacuation. The citizens were evacuated only 20 hours before the hurricane made landfall; according to researchers that is less than half the time that is necessary to evacuate the city. Evacuation time is something that should be taken into consideration before a natural disaster has occurred, when a disaster epidemiologist was forming a disaster plan after doing thorough research. The population of the city, amount of forms of transportation that is available from public transportation to private transportation, to the routes that are available for evacuation. There would be a direct relationship between the first characteristic and the time it takes to evacuate; the greater the population the longer it would take to evacuate. There would be an inverse relationship between the other two characteristics and the time it takes to evacuate the population; if these factors were to increase, then the evacuation time could be decreased (factcheck.org).

The most disturbing aspects of the disaster were the pictures that came from the affected area. Not the pictures of the bodies and people stranded, though those were disturbing themselves, but the pictures that came out of buses and other forms of transportation not being used. One picture that was taken was of a flooded lot filled with school busses. Later it was questioned why these were not used, or even why they were not moved to another area for use after the storm passed. There was even a train offered to help with the evacuation. According to Amtrak, a train was offered by them to help transport evacuees from the city, but the city declined the offer. The city then turned around and denied that they were offered a train by Amtrak. These could have been used to help with the evacuation of the city before the storm hit and after, speeding up the process (factcheck.org). These are things that would have been sorted out by the disaster epidemiologists. All of the forms of transportation possible would have been used for evacuation.

Another disturbing aspect of the relief is the lack of supplies that reached the ones affected. There were reports that the Red Cross was denied entrance into the city multiple times. The supplies eventually got there but days after the storm had passed. There was so much controversy that it led to an investigation as to who was responsible for the relief efforts in New Orleans. It eventually led to the resignation of Michael Brown, FEMA director. Brown later said that one of the reasons why there were problems was the fact that the Governor of Louisiana and the staff did not have a clear and coherent plan as far as the relief efforts. That was later denied by the Governor. Whatever the problem was, there needed to be a solution. There needed a clear plan as to what needed to be done before the storm hit and what needed to be done after the storm hit. (factcheck.org). These are problems that not only may have been prevented by disaster epidemiologists, as they would have planned all of this out already, but also by a proper

disaster management plan. When a disaster management plan is in place, there are clear distinctions as far as responsibilities. There possibly would have been less confusion when it came to decisions and aid could have been distributed without any problems.

Another problem that occurred is the looting and the general lack of cooperation. The confusion between the organizations involved, the finger-pointing that occurred, and what seemed like just general neglect. This may have been solved if the population had also adhered to some of the principles in the Humanist Manifesto. They could have cooperated with each other and limited the problems and confusion that occurred. It may have also helped with the protection that the aid workers needed when they tried to bring in resources. If the population had been more cooperative and acted in a way that benefited all, the protection may not have been needed.

Conclusion

Disasters are events that can occur in a flash and level a city. They can come in a vengeance and go without saying goodbye, but they are a part of our lives so we as a civilization need to find ways to cope. To do this, destruction needs to be minimized with corrections to disaster plans. With the help of disaster epidemiologists, plans can be modified to make sure that there is the least amount of damage and that the greatest amounts of lives are saved. They can do this by researching the various disasters that could occur in an area and then provide the plan that matches the different disasters. Though it cannot be determined accurately whether addition of epidemiologists and proper disaster management would help in the relief efforts, determining the problems in an actual event and finding that theoretically they would help, it can be concluded

that they would help with the relief effort. More research needs to be done on the subject, though, as these methods are relatively new.

References

Ahern, Mike , R. Sari Kovats, Paul Wilkinson, Roger Few, and Franziska Matthies. "Global Health Impacts of Floods: Epidemiologic Evidence."*epidemiologic reviews* 27 (2005): 36-46. Print.

Boa, Ph.D., Edna F., Dan J. Stein, M.D., Ph.D., and Alexander C. McFarlane, M.D.. "Symptomatology and Psychopathology of Mental Health Problems After Disaster." *Journal of Clinical Psychiatry* 67.2 (2006): 15-25. Print.

“FactCheck.org: Katrina: What Happened When."*FactCheck.org*. Web. 16 Apr. 2011. <http://www.factcheck.org/article3

“Humanist Manifesto I."*American Humanist Association*. Web. 16 Oct. 2010. <http://www.americanhumanist

Noji, Erik K.. "Disaster Epidemiology: Challenges for Public Health Action." *Journal of Public Health Pollicy* 13 (1992): 332-340. Print.

Norris, Fran H., Matthew J. Friedman, Patricia J. Watson, Christopher M. Byrne, Eolia Diaz, and Krzysztof Kaniasty. "60,000 Disaster Victims Speak: Part I. An Empirical Review of the Empirical Literature, 1981–2001."*Psychiatry* 65.3 (2002): 207-239. Print.

Quarantelli, E.L.. "Ten Criteria for Evaluating the Management of Community Disasters."*Disasters* 21 (1997): 39-51. Print.

Tobin, Graham A., and Burrell Elizabeth Montz. *Natural hazards: explanation and integration*. New York: Guilford Press, 1997. Print.

Watson, John T., Michelle Gayer, and Maire A. Connolly. "Epidemics After Natural Disasters." *Emerging Infectious Diseases* 13.1 (2007): 1-5. Print.