Vulnerability
and the Long-term Health and Mental Health Consequences of Disasters

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Overview

Disasters have cascading effects over time that are further amplified by vulnerability, causing many health and mental health consequences to not fully emerge until months after a disaster event. In order to prepare for and respond adequately to the health consequences of disasters it is essential to understand this cascading process and how it interacts with vulnerability. This presentation explains this process and recommends preventive and mitigating activities, including those that can be carried out by local faith communities.

Abstract

The effects of a disasters are known to cascade over time, which each effect triggering subsequent effects. This occurs when existing conditions and immediate impacts interact to create the conditions for additional impacts that may be immediate or delayed. Further, these impacts can be cumulative so that the delayed impacts are a multiple of the initial impact. These cascading cumulative impacts can be overlooked due to the emphasis on the crisis event and the tendency in society to not track longer term consequences.

Disaster events are well known to interact with vulnerability, with the full impact on a person or community best understood as the event multiplied by vulnerability. Thus, vulnerable people not only bear the brunt of the initial impact, they are also more likely to experience longer term health and mental

health consequences after the disaster. Two examples illustrate this point. In 2003 a devastating heat wave hit Europe. The victims of the heat wave were predominantly elderly people living alone and without extended family nearby. The initial mortality estimate from the heat of 30,000 deaths was revised upward each month as the health consequences continued to unfold, eventually reaching 70,000 deaths six months after the heat wave. The majority of deaths were to the isolated elderly, frail and those with chronic illnesses. In a second example, in one of the few disaster studies with pre and post data, disaster survivors of a Puerto Rican hurricane showed increases in depressive, somatic and PTSD symptoms a year after the event. Identifying vulnerable people, reducing risk factors and providing long-term monitoring and support can all help reduce these long-term cumulative impacts. Especially in resource limited areas, local faith communities can effectively delivery these services as part of their overall mission to serve the vulnerable in their communities.

Introduction

Disasters are getting greater attention as the number and severity of disaster events increases. Still, media attention is typically very short term, creating the impression that the effects of a disaster are quickly over. In the recent Nepal earthquake, the number of international news articles went from near 35,000 a day to under 2,000 in less than two weeks (Letaru, 2015). Media attention tends to drive both relief response and policy, as well as the public's perception and understanding of disaster risk and harm (Miles & Morse, 2007). As a result a significant portion of the impact of a disaster never comes to the attention of the public or policy makers, especially longer term impact, distorting relief response and planning. This is a particular concern since the physical and emotional impacts of disasters are best understood when looked at from a long-term perspective that considers how disasters, like a row of dominoes, set off further impacts that multiply their harm. Understanding these cascading effects is essential for developing effective strategies and policies, as well as for understanding the important role played by the local faith community.

In order to understand these cascading impacts we must first clarify what is meant by a disaster. What we usually think of as a disaster is best described as three related elements. The first element is a hazard event, such as extreme weather (e.g. typhoon or tornado) or a man-made event (e.g. war or terrorism). These events in themselves are not disasters, they are simply extreme events. The second and third elements are needed to create a disaster. The second element is exposure, meaning someone or something must be in the path of the extreme event. If there is no exposure there is no disaster, just an isolated extreme event. Finally, there must also be vulnerability to harm. The impact on those exposed to the extreme event is a function of a variety of social, physical, and economic characteristics. The more

vulnerable a person, community or population the greater the harm and the length of time will experience it. In this paper when we use the term disaster we are referring to an event where vulnerable people are exposed and suffer harm.

During the past decade there has been a considerable effort around the world to reduce vulnerability to disasters. The overall evidence is that vulnerability has reduced for some people and not others (Cutter, et al, 2008). For example, efforts to increase urban disaster resilience through development policies have actually increased vulnerability among some groups while improving resilience in others, the net result being increased disparities in vulnerability. This is largely due to the focus on the events while not attending to the related vulnerability. For example, Fainstain (2015) notes that our efforts to improve resiliency and reduce disaster risk have proceeded without attention to the underlying issues of vulnerability and their roots in injustice. She says that "a proposal more sensitive to the issues of injustice … would start with examining the situation of the most vulnerable and develop alternatives that would best protect them…" (p.165).

In this paper we expand on Fainstain's (2015) claim by challenging the existing notions of disasters as singular extreme events. We show that an effective response requires understanding vulnerability to both the immediate event and the longer term cascading impacts. Further, we propose that addressing the injustice that is at the root of vulnerability and disparities is an important role for the local faith community. We conclude with a set of recommendations that include guidance for the local faith community.

Vulnerability

The fundamental issue in vulnerability is that harm is not a direct consequence of exposure to a hazard, but that harm is mediated by vulnerability. Harm may be mediated by, for example, access to resources (think health insurance, transportation, education, housing, etc). Those with greater resources suffer less harm and recover more easily. Those with fewer resources suffer more harm, suffer for a longer time, and are more likely to experience ancillary consequences (for example extended unemployment followed by marital discord, substance abuse, depression, etc).

There are two major vulnerability paradigms in the literature (Tucker, et al, 2015). The outcome vulnerability view focuses on the relationship between hazards, social characteristics and the outcomes that follow from their interaction. This view is seen in the social vulnerability work of Cutter and colleagues (2003), and others (O'Brien, 2007) where poverty, illness, disability and other physical and

social circumstances are known to increase the risk of harm from exposure to a hazard. The contextual vulnerability view sees harm as having root causes in inadequate or ineffective social systems and civil institutions, and emphasizes inequality in access and distribution and the undermining of basic civil institutions (education, housing, healthcare, etc). The work on civil society by Calhoun (2011) and the dismantling of civil institutions as a root cause of vulnerability is an example of this contextual approach to understanding vulnerability. The undermining of institutions that protect the poor and vulnerable, or economic policies that place people in hazardous circumstances are examples of this paradigm.

For our purposes, we agree with O'Brien (2007) that these two paradigms are distinct and complimentary, and both must be understood in formulating a complete hazard response strategy. They both describe determining factors in the immediate and long-term consequences of exposure to hazard. They are both important in understanding the cascading impacts of hazard, particularly in terms of health and mental health consequences. It is not possible to formulate an effective policy or strategy unless the root causes of vulnerability are understood in a way that considers both paradigms.

For example, the U.S. Government Services Administration issued a report on the government's response to Hurricane Katrina and found that the impact was due to the extreme nature of the hurricane overwhelming local infrastructure. This finding was widely criticized for failing to address both the outcome vulnerability of local citizens (elderly, poor, and minority groups at risk) and the contextual vulnerability (government failure to maintain levees, cutting of elder protection programs, etc.) (Finch, et al, 2010; Calhoun, 2011). The implication of this response being that the impact of a disaster, and the adequacy of response, cannot be accurately understood without considering both outcome and contextual factors in vulnerability to harm.

Cascading Impacts

Cascading effects occur when an initial impact triggers other events that contribute to the initial consequences. These are different than long-term impacts which can be understood as enduring consequences of initial effects as opposed to consequences from a chain of linked events. For example, this is seen when people displaced by a disaster event suffer further consequences related to the experience of being displaced, or further consequences of losing resources and livelihood. The current refugee crisis in Europe serves as an example. Refugees traveling what is called the refugee highway (routes commonly used by forcibly displaced people), suffer attacks, starvation, dehydration and a variety of events not part of the original event that forced their displacement but were set in motion by the

response to the original displacing event. Once the refugees arrive in a place of refuge, they are often further harmed by criminal predators, corruption, discrimination and more.

Cascades are common in natural hazards as well as man-made disasters. A natural disaster can lead to a loss of the resources needed to cope with the disaster and the economic livelihood needed to replace those resources. The losses can be multiplied by family and marital harm or conflict, and related mental health impacts. Disasters typically destroy local service infrastructures at a time when they are needed most. People with significant personal resources are less vulnerable to this loss, compared to those who normally depend on these resources and have no replacement. Further compounding these cascading events can be the rapid cessation of emergency support services following a disaster on the assumption that once the immediate damage is cleared away the disaster consequences are over. For example, donations to disaster events typically peak in one week and rapidly decline, cutting off resources for those who continue to be in need. Four years after the 3-11 earthquake and tsunami in Japan 250,000 people are still displaced. Fukushima, including people and products from Fukushima, has become stigmatized, making it very difficult for farmers in the area to make a living, compounding the predicted long-term health consequences. In Haiti, most all of the NGOs responding to the earthquake have long since left, but 130,000 people are still in temporary shelters, and Haiti is struggling to contain a cholera outbreak that has been traced back to one of the United Nations units responding to the 2010 earthquake.

Cascading consequences do not require anything as dramatic as the meltdown of a nuclear power plant, as in the case of Fukushima or Chernobyl. Cascades occur simply because people, systems and infrastructures are interconnected. Communities where members, resources and systems are well connected tend to be thought of as more resilient communities. Conversely, people who lack access and resources are not only more vulnerable, but the community as a whole is more vulnerable. The indicator of such lack of access or inequitable distribution is seen in disparities between different members of a community. Disparities come in many forms, such as economic, educational or health disparities. Those who are more vulnerable to harm typically have lower levels of health status compared to the majority of the community. Davis et al (2010) make the case that health disparities are an indicator of vulnerability to harm from a disaster. They describe disparities as predicting inadequate care following a disaster along with the probability of experiencing cascading impacts. In a clear example of the cascading nature of health impacts, the poor live in areas that are typically less well served with healthcare services, and the agencies that respond to them in a disaster are also typically less well resourced.

All of which brings us to the central point for this paper, that those most at risk to the initial impact of a hazard are also most vulnerable to the cascading consequences of the initial event. In effect, vulnerability is not just being vulnerable to the initial extreme event, but also at risk for long-term consequences. Vulnerability to cascading consequences is a function of personal traits and also the population demographics, community contextual factors and access to and distribution of resources. This will become clearer as we expand on the nature vulnerability and cascading health and mental health impacts.

Cascading Health and Mental Health Impacts

The health consequences of disasters are many and well documented, ranging from immediate physical harm and exposure to disease, and the consequences of physical exposure when food, clean water and housing are destroyed. Besides the immediate impact, there is growing recognition that disasters create conditions for interactions between disease conditions, resulting in what is termed a *syndemic*. A syndemic is the synergistic relationship between two or more disease entities that work together to increase the disease burden on an individual or community. For example, substance abuse, violence and AIDs are known to be linked in what is called the SAVA syndemic. The impact on systems and communities exceeds what would be expected from the sum of the separate conditions (Meyer, et al, 2011). Likewise, asthma and infectious disease, as well as malnutrition and depression are known to be linked.

Disasters are known to generate syndemic relationships between various health and mental health disorders. In addition to the specific disease threats related to a disaster, there is also considerable evidence that survivors suffer a variety of long-term poor health consequences. Oilman, et al (1996) surveyed a large community in California and found that people suffering from a traumatic event not only had poorer health status in general, but suffered more chronic diseases, disability, and mental illness. When a disaster occurs the various social and family impacts set the stage for increases in syndemically related problems, such as marital violence, gender violence, and violence against children (Seward-Cross, 2014). These traumatic outcomes are also linked to physical health outcomes, setting the stage for chronic illnesses. The linkages between these disorders is further related to pre-existing vulnerability, such as reported by Vu et al (2012) who found significant declines in health status among Vietnamese immigrants following Katrina, depending on their pre-disaster economic status, marital status and other social factors, all of which are linked to vulnerability.

In addition to individual impacts, disasters are known to lead to a range of social problems stemming from the breakdown of civil institutions that often follow a disaster. Again, it is the vulnerable who bear the majority of this burden from crime, domestic violence, human trafficking and corruption.

What we begin to see in this evidence is that factors associated with vulnerability are predictors of both immediate and long-term harm. While several event related variables predict the immediate mental health consequences of disasters, including subjective sense of life threat, resource loss, and degree of direct exposure to the disaster, a different set of factors predict the duration and severity of the mental health symptoms. These include social vulnerability, pre-disaster mental and emotional health, and post-disaster support. Basically, the factors predicting initial trauma do not predict long-term impact (Udwin, 2003), while vulnerability does predict long-term harm that results from the interaction of the event with vulnerability and contextual factors.

The syndemic relationship between duration and severity of trauma and social vulnerability points out the cascading impact of traumatic disasters. People who are vulnerable prior to the disaster continue to be vulnerable to the after effects of a disaster. Lack of resources for emotional and physical care, disruption of family and community, forced displacement, and loss of community all have a significant impact on the long-term recovery of impacted people.

The loss of community serves as an illustrative example. People with more resources, such as people above the median in income and economic resources, tend to use their own resources when faced with a major disaster and do not rely on the local community. Poorer people, those without economic resources, tend to reply on their local community as a resource. Thus the destruction of a community has a more severe and lasting impact on the poor than on those who are well off. The loss of community for a poor(er) person means the loss of a source of social, emotional and economic support. In some cultures it can mean an even more basic loss of personal identity. Loss of resource is well established as a cause of trauma, and for the poor person, the loss of resource is greater when community is lost. Recovery is also more difficult since community is an element of recovery, thus, just when the need is the greatest, the poor not only suffer a traumatic event, but lose access to important resources at a time when they are most needed.

In understanding these impacts it is useful to also understand the use and misuse of the diagnosis of post-traumatic stress (PTSD) as a basis for determining impact. A number of researchers have raised concerns that using PTSD as the basis for deciding who has been traumatized leads to very unreliable estimates.

Some authors insist that PTSD is not an appropriate means to estimate harm among disaster survivors, especially those who face long-term displacement and disruption. Primarily, it tends to focus the trauma concept on individual factors exclusive of larger contextual factors and continuing threats. For displaced people the disaster event is just the start of a long and cascading process involving multiple threats and losses, all of which lead to general mental health problems that do not necessarily manifest themselves in symptoms matching PTSD diagnostic criteria (Inglby, 2005). Others argue that we have over medicalized suffering. We tag people with a diagnostic label that supports an intervention pre-judged as necessary, as though exposure to traumatic events automatically leads to a clinically diagnosable condition requiring professional treatment (Rosen, 2004). For example, Eisenruch (1991) describes Cambodian refugees who bereavement process and cultural recovery mimic PTSD symptoms, but represents a healthy process of recovery. Given the long-term nature of disaster disruptions and the interactions among disaster impacts, it is important to adopt broader concepts of traumatic impact that can account for these lasting and interacting impacts, such as using a case management approach rather than a psychotherapy approach to long-term survivor care. (Goldman, et al, 2014).

Our conclusion from the above is that we need to reconsider how we assess and understand care needs following a disaster event. Current approaches do not sufficiently address the interactions with vulnerability and the long-term cascading and synergistic consequences of a disaster event. Further, when assessing emotional trauma there is an over reliance on Western categories based on individual trauma that cause us to misunderstand the scope and nature of disaster related trauma. However, there is in this situation an opportunity for the local faith community.

Role of the Local Faith Community

There are several important considerations when discussing the role of local faith communities in disasters. Recently the World Evangelical Alliance (in partnership with several faith-based NGOs and the Humanitarian Disaster Institute at Wheaton College) presented a position paper to the United Nations Humanitarian Summit on the role of the Evangelical Community in relief and development (WEA, 2015). The WEA emphasized three points: The local faith community is a significant part of the local community, and as such in an important position to understand and speak for the needs of the community, especially the vulnerable in the community; The local faith communities have historically spoken on issues of justice and compassion which go to the heart of exposure to vulnerability and suffering; And failing to partner with the local faith community is a failure to understand the local community in its entirety. As such, it represents a lost opportunity for the secular world.

As a permanent resident in the community, the local faith community is positioned to address the continuing impacts of disaster events. It is generally acknowledged that faith communities are the first to respond and the last to leave, which is an expression of their presence in and relationship to the larger community. But in order to fulfill its historical role the local faith community needs to do several things. First it must realize the distorting effects of the media focus on extreme events (Boan, et al, in review; Aten & Boan, 2015). Disasters must be seen as both crisis and slowly unfolding events with a variety of short and long-term consequences for the community. The media emphasis on attention grabbing extreme events creates the unfortunate perception that the crisis is all there is to a disaster, and even more importantly, that disaster response is the domain of experts and professionals where the faith community is an untrained intruder. Local faith communities are in a more intimate relationship with the community as a whole and therefore more knowledgeable of the local culture, systems, and services that interact with vulnerability.

The full range of ways for local faith communities to serve is beyond the scope of this paper, but we will address one basic recommendation. Local faith communities are in a position to not just be aware of risks but also rectify these vulnerabilities. When local ministries become "disaster aware" their ministries are informed by the disaster risks faced by the community and the disproportionate risk and burden placed on the vulnerable (Aten & Boan, 2015). In this way faith communities consider how the people they serve will be impacted by the likely disasters in their region and how the faith community can work over time to reduce vulnerability.

Conclusions

First, we need to stop thinking of a disaster as one event. In order to understand the health and mental health consequences we must look at downstream and cascading events as well as immediate events (Crabtree, 2013). Further, since those most vulnerable to continuing harm are also most vulnerable prior to the event, we must improve our identification of those who will need long-term assistance. Estimates of vulnerability to long-term impact should become a standard feature of program and policy development.

Second, in order to understand the health and mental health consequences of a disaster we must look beyond PTSD as means to identify and understand harm. The assumption that everyone exposed to a traumatic event will suffer PTSD unless they are treated is not supported by evidence and at best a dubious assumption. People need to be understood in their cultural and pre-disaster context as well as

disaster exposure, and screened for assistance in a way that considers a full range of possible expressions of trauma and coping and how these needs interact with culture, systems and available resources.

Third, recognizing that prevention is better than cure, we need policies that recognize the various ways that vulnerable people are at risk, and continue to be at risk following a disaster event. We agree with Fainstain (2015) that disaster risk reduction should start with an understanding of vulnerability and how vulnerable people will be impacted by policy. Assumptions that all people will benefit from the same strategy, or that benefits will trickle down to those most in need have been repeatedly proven wrong but persist just the same. Similarly, there is growing evidence that programs that are not adapted to local needs and risks, even while providing an overall benefit to a community, increase the disparity between those who are better resourced and those who are vulnerable.

Finally, recognizing the impact of vulnerability and the cascading nature of disaster impacts has important implications for the local faith community. Disaster ministry should never be deferred to professionals nor assumed to be the exclusive domain of government agencies. Serving the vulnerable is an essential element of Christian faith and other faiths. Disasters reveal the vulnerable in a community and the injustice that maintains their vulnerability, pointing the way for the faith community to serve the poor and vulnerable. Specifically, we encourage the faith community to:

a) Make the various ministries and programs of the local faith community "disaster aware", which means to ask who are the vulnerable that are being served and how a disaster event will impact these people. In that sense, disaster awareness is to start by asking who are the vulnerable and how they will be impacted, the same approach recommended for all programs and policies.
b) Improve the ability to partner across local houses of worship and across faiths, bringing down barriers to service.
c) Advocate for those in need, providing a voice for the vulnerable when policies are created or programs implemented
d) Recognize that the international community and the media are poor reflections of the service needs related to disasters because they will always prioritize the crisis over the long term. It is the local faith community that has a continuing presence in the community and can serve in ways that no other organization can match. Therefore, learn from and collaborate with relief organizations, but maintain the special and unique ministries that define the faith community.

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