



Investigating Community Resilience in Bhaktapur District and Surrounding Areas in Nepal following the 2015 Earthquake

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Abstract

Following the Nepal, Gorkha, M7.8 earthquake on April 25, 2015 a research team of several academic and practitioner experts in earthquake engineering, community resilience, and risk reduction, spent a week in Nepal to document the impact the earthquake had in Bhaktapur and surrounding districts. Strategic goals of the reconnaissance team included ‘investigating recovery and resilience related issues’, along with the more traditional pursuits. Over the course of 8 days, two social scientists with the team collected information from 80 community members about cultural, psychological and social factors with implications for rebuilding and future disaster preparedness. Results from this rapid assessment highlight community perspective on the following topics: culturally specific disaster attributions, psychological distress, preferred means of coping, social support, community conflicts, livelihood implications and other economic impacts, and concerns with governance and corruption - providing a snapshot of the situation in the early aftermath of the earthquake. In partnership with a local Nepali organization, one of the reconnaissance team members, a social psychologist, was awarded a grant to investigate future disaster preparedness and recovery for 240 persons over a period of several months in two of the hardest hit communities in Bhaktapur district: Chhaling and Tathali. Although detailed findings from this intervention research will be reported elsewhere, some descriptive data from the work in Bhaktapur is used to augment findings from the rapid assessment. Results are situated within a larger body of literature on earthquake impacts and recovery. Suggestions are made for future research to further examine factors highlighted in this initial assessment.



Background

On 25th April 2015 Nepal experienced a 7.8 magnitude earthquake, followed by countless aftershocks, including one of 7.3 magnitude on 12th May, 2015. The earthquake affected 14 out of the 75 districts of the country, with just under 9,000 people dead and over 600,000 homes destroyed [1]. In Nepal approx. 10,000 families are affected annually by natural disasters with at least 200 people killed each year [2]. Ninety-seven percent of the population of Nepal resides in areas at risk of multiple hazards [3]. Geographical isolation and lack of infrastructure further compound the risk of loss to life and property in the event of natural disasters. In the three decades prior to the 2015 earthquake, nearly 80 events have been recorded that have killed over 11,000 people and affected more than 5 million [2].

Given this high risk for natural disasters in Nepal, it is important to understand cultural, psychological and social factors with implications for recovery and disaster preparedness. A rich literature on seismic hazards adjustment indicates such factors may play a significant role in disaster mitigation and long-term recovery. As a result of important areas highlighted in previous disaster research, questions of interest for this rapid assessment included: How do affected communities explain what causes disasters?, Do such explanations affect risk mitigation behaviors?, What type of distress do community members experience in the aftermath of a major earthquake?, What role might specific forms of coping, including social support, play in recovery?, How do community members describe loss of livelihoods, and other economic impacts of the earthquake?, How might challenges in governance, including high rates of corruption in Nepal, impact public perception of ongoing recovery efforts? Asking such questions in the early aftermath of the earthquake in Nepal enabled us to highlight topics likely of interest to a variety of disaster researchers.

Disaster attributions may influence preparedness. Research has indicated that theological explanations for earthquakes, and other natural hazards, can be prevalent among some cultural groups. Such attributions, including those linked to fatalism, have generally been associated with a lack of engagement in risk mitigation behaviors [4]. Nepal is a country rich in spiritual beliefs, where the majority are Hindu, with many practicing Buddhists as well [5]. Given this, it is likely that religious beliefs play a significant role in narratives surrounding the earthquake.

Psychological distress is common in the aftermath of earthquakes. Disasters can have severe mental health consequences, especially for those with limited psychosocial resources [6]. Post-traumatic stress, anxiety, depression, and somatic symptoms, including physical pain and sleep disturbances, are typically common [7]. These type of mental health symptoms can impact one's ability to engage in recovery efforts. In a meta-analysis of disaster survivors in 80 countries, nearly one-quarter of those reporting symptoms also experienced substantial functional impairment, limiting their ability to perform daily activities [6]. Although many recover, a portion of those experiencing psychological distress remain impaired for years, impacting their ability to work and fulfill family responsibilities such as child-rearing.

How communities and individuals cope with distress, including whether they have access to social support, likely plays a role in recovery. There is a rich literature on the link between social support and mental well-being across the lifespan, including in times of adversity [8]. In addition, the health of the community system is an important consideration during the long process of rebuilding. Prosocial behaviors and community conflict have been reported in the aftermath of the disasters, and may affect the wellbeing of individual community members, as well as the ability of the entire community to recover [9,10].

Additionally, a natural disaster, such as an earthquake, can undermine livelihoods and have adverse impacts on the larger economy for years. This economic impact can be even greater for developing countries like Nepal [11], and can be complex when also considering the influx of aid [12]. In addition, socio-political issues, including poor governance and corruption, may interfere with the efficient utilization of relief aid, creating obstacles on the road to long-term recovery [12]. Ultimately, the process of recovery and rebuilding involves taking all of these factors into account, while prioritizing the voices of those directly affected by natural disasters in determining how to build back better.



Current Study

We (author one and two of this manuscript) were part of an interdisciplinary earthquake reconnaissance team Nepal, comprised of foreign and Nepali engineers and social scientists, sponsored by the Earthquake Engineering Research Institute and the National Society for Earthquake Technology Nepal. Our team visited several districts in Nepal shortly after the 2015 earthquake to conduct a rapid assessment. This article is based on our work as social scientists, and emphasizes questions outlined in the background section, that we hope are relevant to a wide variety of disaster researchers.

Methods

Procedures

Primary qualitative findings were obtained through brief community interviews, and have been augmented with newspaper reports, and some descriptive data from our disaster mental health intervention research projects in earthquake affected communities in Bhaktapur, Nepal (cluster comparisons; manuscript in preparation). We conducted 80 interviews during this rapid assessment, most with community members, and a few with government officials and relief agency staff. Interviews took place in five districts: Bhaktapur, Kathmandu, Lalitpur, Kavre Palanchok, and Sindhupalchok, during the period from May 31st-June 8th, 2015. Semi-structured interviews were in Nepali, and began with introductions and brief consent procedures. The interviews ranged from a few minutes to over an hour, averaging approximately 20-25 minutes per participant. At the conclusion of each interview small gifts of appreciation, such a soap or flashlights, were provided. Interview content was transcribed in notebooks for later review. We chose not to record interviews in order to minimize the potential for participant discomfort.

Sample

The convenience sample was determined primarily by who was available and willing to speak with us as we walked through communities, with the larger team of engineers surveying the damage. Only adults were interviewed, and included relatively equal numbers of men and women, of various ages, and representing a variety of ethnic groups. As a result of our sampling approach, community members in relatively accessible areas, such as by roads or district headquarters, are over-represented, with little input from those in more remote rural areas. The additional data pulled from the authors' disaster research in Nepal, was obtained through interviews with adult participants who were randomly selected, and therefore, representative of the whole community, unlike this convenience sample. We made the choice to include some of this data here to compare and contrast with the findings from the rapid assessment. Synthesizing information from different sources allows us to underscore similar results, despite significant methodological differences.

Semi-structured interviews

After exchanging introductions, and completing a brief consent procedure, we typically began interviews by asking community members: "What do you think caused the earthquake?" After asking about disaster attributions, we typically asked community members if they believed they were at risk for additional disasters in the near future, including earthquakes, aftershocks and/or landslides. We went on to ask about whether people were engaged in any type of disaster preparedness in order to mitigate risk. We were also interested in the mental health and wellbeing of those directly affected by the earthquake. We asked community members about 1) any psychological difficulties they may be experiencing, 2) top concerns or worries, and 3) whether such concerns might be interfering with their ability to perform daily tasks. As a follow up, we asked community members about preferred means of coping with post-earthquake stressors. Time permitting, we spoke with individuals about whether they noticed any changes in the community after the earthquake, such as an increase in social support or conflict. Finally, we asked generally about the impact of the earthquake on livelihoods and the process of rebuilding. We wrapped up interviews by allowing participants to provide additional feedback about any topic of interest and thanking them for their time.

Given time limitations, and in order to allow participants to speak freely and elaborate on topics of interest, we did not typically cover all of these questions in each interview. Instead, each night we reviewed interview notes and determined what questions to prioritize the following day based on gaps in responses. For



example, having collected quite a bit of information on disaster attributions and mental health over the first few days of community interviews, we emphasized questions about community cohesion and livelihoods in subsequent days.

Results

We have selected representative quotes in an attempt to accurately reflect the views of the majority of community members interviewed. However, this is based on our review of handwritten notes compiled during interviews, and did not involve a systematic coding process. In addition, we could not obtain specific frequency counts associated with a particular theme because all respondents did not receive the same questions. In this section, we have highlighted community responses, supplementing with additional information from other sources to emphasize similarities between these findings and results obtained using other methodological approaches. .

Culturally specific disaster attributions

Many people we interviewed indicated that the earthquake occurred because people have lost the path of religion/spirituality or dharma, and this has made the Gods angry. Some went on to explain that the past deeds (karma) of some community members were to blame for the earthquake, and even went so far as to indicate that this may explain why some died while others were spared. Other community members stated that certain buildings were damaged due to a lack of proper site selection and preparation with Brahmin priests. Some people shared their beliefs that the reason certain structures such as the Palace of the Kumari (“living goddess”) in Kathmandu’s Durbar Square and Pashupatinath Temple complex in Kathmandu were still standing was because the Gods chose to protect these structures. Still others referred to the ‘movement of snakes’ under the earth causing the earthquake, presumably making reference to Sheshnag, the hundred-headed snake that holds Lord Vishnu and is said to cause earthquakes when it moves one of its many heads [see 13 for an explanation]. These responses are consistent with our additional research in Bhaktapur district. When we asked 238 persons in two communities in Bhaktapur why disasters occur, 43% indicated ‘Will of the Gods’ while 22% stated ‘karma’ (result of previous actions). Of course, some community members believe earthquakes occur when rocks move or slip underground. This explanation appeared to be more common however, among younger and educated participants, especially in urban areas.

Future risk of disasters and disaster preparedness

When asked about risk, most respondents stated they believed they were at very high risk for experiencing future natural disasters. Many went on to explain that they were “very afraid” about the possibility of additional earthquakes. When asked about preparedness measures to mitigate risk of future disasters, numerous respondents indicated that they weren’t doing anything to prepare. Others explained they will repair or retrofit existing homes, or build new structures, working in consultation with local architects or engineers to ensure homes are earthquake resistant. A handful of others said they plan to store extra food and water, keep documents in a safe place, and/or discuss what to do in the event of a disaster with their family members, including putting in place evacuation plans. In our intervention research with earthquake affected communities in Bhaktapur district (N = 240), data collected a few months after the earthquake indicated relatively high rates of reported preparedness: 86% had secured their dwelling in some manner in anticipation of continued aftershocks and monsoon rains (often associated with flooding); 87% has put important documents in a safe place; 50% had discussed a family emergency plan.

Interestingly many of the people we interviewed, representing a variety of ethnic and caste groups from both rural and urban areas, told us about spiritual/religious practices (including ‘puja’) in response to questions about risk mitigation and disaster preparedness. Puja is the act of showing reverence to a god, a spirit, or another aspect of the divine, through offerings such as fruit, rice, flowers, prayers, and/or songs. Respondents spoke quite a bit about a specific ceremony known as “Chyama Puja” which loosely translates to mean “forgiveness ceremony.” In addition to those who had *already* performed the ceremony to ask forgiveness from the Gods, others told us that they planned to hold the ceremony in the coming days. One resident in a community where 250 households had participated in the ceremony a few days earlier explained, “After performing the Chyama Puja we were content, it helped, now we are less fearful of aftershocks.”



At times our question about disaster preparedness measures was met with fatalistic responses. For example, we visited a community on the outskirts of Kathmandu, at the top of the ridgeline, where most of the residential structures had been destroyed. We were told by community members that the army came through and asked them to evacuate due to landslide risk. However, most community members had already put up temporary shelters in anticipation of monsoon rains. When asked why people didn't seem to be following the army's advice to relocate, one local Tamang woman explained, "No matter where you go, if it is written in your fate to die you will die."

While such responses came up across several interviews, and in a variety of locations, this is not to suggest that spiritual ceremonies are performed as a sole means of disaster mitigation or coping, or that fatalism is rampant, or necessarily associated with inaction. Even among those who believed that the earthquake was a result of the Will of the Gods, disaster preparedness was happening. This is consistent with our observations based on disaster mental health intervention research in Nepal. We have found many community members embracing a divine explanation for natural disasters, while also engaging in reinforcing or modify dwellings to mitigate the potential for damage from future disasters. Often people will explain "the Gods help those who help themselves."

Nepal is a diverse country where many belief systems can be found. Educated youth in urban areas tend to favor scientific explanations for the earthquake. Urban planners and engineers in Nepal have explained that Pashupatinath Temple is still standing, not because of divine intervention, but because of the building materials used [14]. As noted in a CNN article that appeared shortly after the earthquakes in Nepal, "Some place the blame at the feet of karma -- human actions that result in future consequences. But many others see earthquakes and tsunamis as amoral events, neither caused by angry deities nor visited on deserving sinners" [15].

Psychological distress

Most people we spoke with reported psychological distress of one form or another. One elder woman, in a community where nearly all of the homes had been destroyed, stated "The people who died in the earthquake are not in any pain, but the ones who lived have to face continued suffering." Countless people spoke of living in constant fear of another earthquake, and re-experiencing in the form of the ground moving – not being able to tell when actual aftershocks were taking place, "I always feel like the earth is moving, we are living in constant fear of another earthquake." Sleep difficulties were mentioned frequently. Some interviewees raised concerns about the potential impact of caregiver distress on children, "When parents constantly say, 'we are going to die, there is nothing we can do, all is lost' of course children will be fearful and unable to sleep."

A few people shared concerns about an increase in alcohol use among some community members, along with an increase in interpersonal conflicts, and general irritability. We spoke to some survivors who explained that intoxicated community members had been making people feel nervous in some of the displaced camps. In our research with earthquake affected communities in Bhaktapur, twenty-one percent indicated using alcohol or other drugs to cope with earthquake-related distress at least some of the time.

Several participants explained that feelings of hopelessness about the future were having an impact on their motivation to harvest and rebuild, "now is the time to harvest and plant, but we are too stressed and sad..." Another indicated, "we should be planting cash crops now, but we can't make ourselves go to the field because of everything that has happened; we will lose a lot of income." Others shared intrusive memories of having been buried under rubble, explaining that it was hard for them to concentrate on farming and other work considering what they had experienced.

In addition to concerns over disruption in the harvest, many of those we interviewed reported chronic worry over - *lack of livelihood opportunities, lack of resources for rebuilding (and inadequate current housing), and the potential impact of the earthquake on their children's future.* These findings are consistent with results of a nationwide public opinion survey in Nepal shortly after the earthquake involving 3,500 respondents in 35 districts [16]. The top four earthquake-related concerns were: 1) a lack of adequate housing (95% stated it was the major concern); 2) lack of sufficient food (65%); 3) disruptions in children's education; and 4) disruptions in farming.

Reports of psychological distress are also consistent with findings from leading mental health agencies responding to the earthquake in Nepal. International Medical Corps and others have emphasized that earthquake



affected communities are experiencing - unfulfilled basic needs, a loss of livelihood opportunities, and in some cases, a loss of traditional social networks - all contributing to psychological distress. Common forms of distress emphasized by IMC in their rapid assessments weeks after the earthquakes include: fear, anxiety, sadness, anger, sleep difficulties, and increased risk of suicide [17].

Finally, while Western-derived notions of psychological distress such as “depression” and “post-traumatic stress disorder” are likely still relevant in the Nepali context, it is also important to consider local idioms of distress. A comprehensive Nepal-specific mental health literature review was conducted in the aftermath of the earthquake [18]. The review highlighted the importance of considering culturally-specific frameworks for understanding psychological distress. For example, it is not uncommon for some in Nepal to explain earthquake-related distress as a “wound” to the “heart-mind” or a “soul loss.” When speaking to community members, several shared symptoms consistent with such frameworks in response to questions about psychological distress and general suffering.

Preferred means of coping

As indicated previously, many community members are engaging in spiritual activities such as puja, and appear to be deriving comfort from such practice. In our related research with earthquake affected communities in Bhaktapur, 44% of respondents indicated that in order to cope with the stress of the earthquake they have been performing puja or other worship activities, and 43% indicated that have been engaging in breathing, meditation or other relaxation exercises.

We also noticed some community members using *reframing*, or focusing on the positive aspects of the disaster instead of what was lost. For example, in one community we visited where nearly all homes were destroyed, most of the community members we spoke with explained to us that they are happy to be alive and are focused on feelings of gratitude rather than feelings of hopelessness or distress. They went on to explain that when the earthquake occurred all adults were working in the fields, and the children were together watching a movie in one building that did not collapse (although the roof slid off). There were no deaths. So, despite the destruction of most of their homes, many people said they felt thankful to have been spared, “If the earthquake came at night no one would have escaped.” This type of reframing has been associated with resilience and wellbeing [19], and may serve some communities well during the long rebuilding process ahead.

Social support and community conflict

Research on well-being following natural disasters has repeatedly emphasized the value of social support in aiding recovery. While disasters have the potential to bring communities together, stressful events can also increase conflict, including competition over scarce resources. We asked community members if people were supporting one another in the aftermath of the earthquake - whether neighbors were helping one another, and to what extent conflicts had arisen. There were countless stories of volunteerism and cooperation in communities – among neighbors, and coming from local business leaders, local religious groups, and youth groups. Much has been written about this, including a piece in the New York Times on the ‘new volunteerism’ emerging in Nepal in the aftermath of this earthquake [20].

As we travelled, we encountered several striking examples of this, most notably in a landless ‘squatter’ settlement in Kathmandu along the banks of the Bagmati river. This is a community we were familiar with through previous research. We visited them to see what may have changed after the earthquake. Community members explained that they had lost very little due in part to the flimsy nature of their dwelling: “our homes are not much; when the earthquake came some fell over and we just picked them back up.” In a community with very little, a significant sum of money had been collected to support earthquake victims in neighboring areas of Kathmandu. This community also provided temporary shelter for dozens of families in the immediate aftermath of the earthquake when they discovered displaced persons sleeping on a nearby bridge. In other areas we spoke to several community members who were voluntarily helping others to rebuild. One quote from our Bhaktapur data set underscores this, “My house was collapsed and my food and grains were buried in to the mud. [a neighbor] fed me for two days 2 to 3 times a day. And one [neighbor] told me that she will provide me a room in her house to put my belongings...people helped me a lot.”

Although the spirit of cooperation and volunteerism we observed was impressive, we also heard stories of conflict in communities. Conflicts were reported by several interviewees and seemed to center around: 1)



relief aid – jealously regarding distribution practices and concerns about fairness in selection of aid recipients; 2) water use/access and similar resource issues; and 3) use of farming land for temporary settlements when it was needed for harvesting and planting. As one respondent indicated, “When there [are] relief materials some households get jealous and fight with each other.” Another person, an older man who had lost his home, told us that he expects, “the community will be fighting a lot about rebuilding issues.” Others indicated that mental health issues may be fueling disputes, “After what happened many people get angry easily and are very afraid and because of this they behave badly with each other...” Finally, some community members explained that “people seem to be less caring about each other now [after the earthquake] because they are preoccupied with their own needs.”

Comparing these response to responses from our research with earthquake-affected community members in Bhaktapur district may provide a useful point of reference. Thirty-two percent of respondents believed relationships in the community had strengthened after the earthquake. Sixteen percent of respondents however, indicated that their community had definitely become less harmonious since the earthquake, while nearly half (45%) partially agreed with the statement “there is less harmony in this community after the earthquake.” In associated focus groups, community members emphasized that community in-fighting, gossiping, and fighting within families after the earthquake was a problem. They attributed this to: increased stress-related alcohol consumption (in order to help with sleep), unemployment, competition over aid resources (perceived deception by neighbors and corruption by local government officials). Many indicated that “for about 15 days people were helpful, but then began to fight.”

Additional considerations

Livelihoods and the economy. We wanted to include some exploration of livelihoods, and other economic issues, especially given the potential importance of this topic both for mental health and well-being and broader recovery in the aftermath of the earthquake. Although most Nepalis in the hardest hit areas did not have home insurance, the government announced a compensation/remuneration package just weeks after the earthquake for those who lost loved ones and property. Yet many of the community members we spoke with did not feel optimistic about being able to access these funds - a typical response, “I heard the government will give NPR. 15,000/- [USD \$144] for destroyed homes, but I doubt this will happen.” Several people stated that they don’t have the proper papers, such as identity documents and blueprints of their home, that would enable them to access funds. In some cases, these documents were buried in the rubble. Several people explained that they don’t have enough ‘political influence’ to claim their remuneration. This is consistent with information in news reports a few months after the earthquake indicating, “When it comes to reconstruction, while Nepal's government has promised several types of benefits for victims of the earthquake, including initial grants of \$144, to be followed by grants of \$1,922, and loans at 2 percent interest rates for rebuilding homes, confusion is rife over how to go about obtaining them” [21].

In addition to confusion and cynicism over access to compensation, community members explained that the amount of compensation for a home that had been destroyed was about 25% of what it will actually cost to rebuild the same basic structure. This does not include the considerable amount of money required to demolish condemned structures and clear rubble. Many people explained that it took them 10-15 years or longer, to build their homes, working on one room or story at a time, as money became available. Some took out loans, and as one woman in a village in Sindupalchowk district mentioned, “Everything I worked for my whole life was destroyed in a few sections. I took out loans that I won’t be able to repay.” Given this, several participants explained that they don’t expect to be able to rebuild quickly. A few people we spoke with also mentioned that families renting homes, with no eligibility for compensation of lost property and nowhere to go, are facing even greater difficulties than homeowners.

Several community members expressed concerns that the earthquake will result in widespread and potentially long-lasting disruptions to the economy. Community members highlighted concerns over - loss of livestock, late harvest/planting this year and potentially lower crop yields, and a decrease in tourism. One woman with two young children explained, “Myself and my son were buried in our house. We dug ourselves out, but our goat, buffalo, and 46 chickens were lost. How will we recover?” We also heard concerns about a lack of available goods for small shop owners to keep up with supply demand. Despite these challenges, the earthquake, and subsequent humanitarian response, has created opportunities for some, including an increase in



work for many ‘unskilled’ day laborers clearing the rubble and assisting in rebuilding. During our community visits we spoke with a few people who had been unemployed before the earthquake but were now paid to be involved in clean-up efforts.

Governance and corruption. During the period 1996-2006 Nepal experienced a civil war between government forces and the Communist Party of Nepal (Maoist). The civil war resulted in 15,000 deaths -- mostly civilians -- and an estimated 150,000 displaced persons. The Maoists are now members of the current government, known as the Federal Democratic Republic of Nepal. The 2013 elections marked an important step toward the formation of an inclusive and democratic state [22]. The country’s political transition however, including drafting of a new constitution, took much longer than expected.

During our interviews, several community members expressed cynicism about the government’s ability to handle the earthquake response and rebuilding process, citing the government’s inability to put a new constitution in place since 2006. When asked about the draft of the new constitution circulating shortly after the earthquake, some interviewees expressed concerns that the new constitution would not represent everyone, especially women and ethnic minority groups. This feedback is consistent with opinion polls shortly after the earthquake indicating widespread disillusionment among the public with the government. “This year, an inadequate political response to the earthquake, the delays in the constitution and persistent political infighting seem to have heightened public disenchantment” [16].

Corruption in the public sector has long been a problem in Nepal. In 2014 Nepal slipped on the corruption perception index [24] “...earning a dubious distinction as one of the most corrupt states in the world” [24]. Thirty-two percent of citizens surveyed reported having paid a bribe in the last 12 months. Sadly, these results are not surprising, in that they are consistent with what we heard during interviews. Several community members explained that they would need to pay bribes or have political connections in order to access earthquake-related remuneration or even locally distributed relief aid. In addition, many community members explained that they trusted humanitarian aid organizations to distribute aid in a fair manner, but did not trust local politicians to do the same. Several community members emphasized that local politicians are keeping everything for themselves and their networks of political supporters, and using the earthquake to further their own political agenda. Such bias in the distribution of relief aid has been reported by Amnesty International: “Survivors report that in some communities the aid effort has been politically manipulated... Those with muscle – political connections – end up claiming desperately needed supplies meant for everyone” [25].

Discussion

Although the rapid assessment was brief, and based on non-random sampling methods, community interviews resulted in important feedback about a number of topics. In addition, findings were consistent with our disaster mental health intervention research being implemented in districts throughout Nepal, and also echoed content from news outlets, opinion surveys, and humanitarian agency reports. The qualitative data provided through this rapid assessment was invaluable as a point of comparison with these other sources. First person perspectives obtained through this rapid assessment can be situated within a broader context of disaster research, and can also provide a roadmap for future research.

Perceived risk of future disasters was high, not surprisingly, considering that interviews took place just weeks after the 7.8 earthquake, during a period when 4.0 magnitude and above aftershocks were happening regularly. However, seismic hazards adjustment research does not indicate a strong and consistent relationship between risk perception and risk mitigation [see 4 for a review]. In this rapid assessment, while we did not systematically examine the relationship between risk and preparedness [4], many community members we spoke with described risk mitigation activities such as reinforcing dwellings, and storage of food, water and important documents. Still others had strong fatalistic attitudes, in some cases seemingly discouraging them from risk mitigation. This is consistent with previous research suggesting that a fatalistic attitude may be negatively associated with intention to adjust to seismic risk [4].

Culturally specific disaster attributions about the earthquake occurring as a result of ‘God’s Will’ also came up frequently. This is consistent with other research suggesting that such attributions are not uncommon, and emphasizing that associated narratives can exist in parallel with scientific narratives [4]. In addition, during this assessment such beliefs seemed to inform spiritual and religious practices designed to mitigate risk. Additional research should examine how disaster attributions, and other socio-cultural and contextual factors



(e.g. community-agency relationships), influence engagement in preparedness efforts [see 26 for a proposed model].

Mental health symptoms are common in the aftermath of natural disaster [7, 6], can interfere with the ability to complete daily tasks, undermining the potential for rebuilding and recovery. In Nepal, based on previous research globally and in-country, it may be expected that “around 15 to 20% will have a mild or moderate mental disorder (for example, mild and moderate forms of depression and anxiety disorders, including mild and moderate PTSD); and around 3 to 4% will have severe mental disorder (for example, psychosis, severe depression, severely disabling form of anxiety disorder)” [5, p. 32]. Consistent with these expectations, during the rapid assessment, many community members reported symptoms commonly associated with depression, anxiety and PTSD. These findings were consistent with other rapid assessments of mental health symptoms in the early aftermath of the earthquake [17].

Psychological distress, common among those whom we spoke with, may be reduced in some measure through utilization of preferred forms of coping such as performing puja or other worship activities. Many people in Nepal are comfortable utilizing a variety of traditional and spiritual healing approaches [5]. Given this, and the diversity of presenting symptoms, belief systems, and ethnic groups in Nepal, it is advisable to involve multiple stakeholders - including family members/peers, traditional healers (shaman or priests), psychosocial workers and/or mental health clinicians – in supporting the process of recovery for distressed earthquake survivors (see IASC, 2015 for a detailed analysis of mental health related considerations in the Nepalese context). It may also be useful to further investigate characteristics of resilient community members. For example, several times during interviews people mentioned using positive reframing to cope with earthquake related stress. This is consistent with research conducted with culturally similar groups of Bhutanese refugees in Nepal; positive reframing was one of the most frequently utilized coping strategies [27]. Such reframing has generally been associated with resilience and wellbeing [19].

Prosocial behavior was evident through media reports, interviews with community members in some of the hardest hit areas, and observations of groups working together to provide relief aid and rebuild. This is consistent with other research noting the prevalence of prosocial behavior in the aftermath of disasters [10]. Community conflict was also reported including competition over aid resources. It remains unclear however, what factors may enhance cohesion or produce conflict among communities in Nepal in the aftermath of natural disasters. Caste/ethnicity, socioeconomic status, and geographic location may play a role, but all are in need of more rigorous research before conclusions can be drawn.

Economic impacts of the earthquake on livelihoods, through job creation in some sectors and lack of employment opportunities in others, will likely continue to influence recovery efforts. The potential long-term impact of the earthquake on tourism-dependent industries was a concern raised by community members. The impact of the earthquake on tourism revenue and recommended tourism disaster planning should be investigated further [see 28 for suggested frameworks]. In addition, as others have pointed out, earthquakes and the resulting financial aid can fuel corruption [12]. Issues of good governance, corruption and appropriate utilization of relief aid funds continue to be at the forefront of much of the ongoing critique over the pace of recovery in Nepal. Furthermore, ongoing protests as a result of new constitution in 2015 and into 2016, and associated informal closures of the southern border with India made it difficult to obtain the supplies needed to aid in recovery efforts [see 29 for an explanation of the current situation]. There is much work to be done on the part of government officials to win the trust of community members in some of the hardest hit districts. As Kathleen Tierney points out in her 2014 book, *The Social Roots of Risk* [30], risk and disasters are produced by government, civil society, and other groups that thwart risk reduction efforts and are not held accountable when losses occur. Research priorities should include determining to what extent this earthquake, and associated response from multiple stakeholders, will change attitudes within the government and influence future preparedness efforts.

Summary and Suggestions for Future Research

We have explored a variety of cultural, psychological and social factors that may influence preparedness, recovery and rebuilding by highlighting community feedback during a rapid 8-day assessment a few weeks after a 7.8 magnitude earthquake in Nepal. We recommend future researchers explore such factors in greater depth in order to contribute in ways that may be helpful to ongoing recovery and long-term rebuilding. In



addition, although we will report detailed results from our ongoing intervention research in Bhaktapur district elsewhere, initial results suggest that a brief, mental health integrated, culturally adapted, disaster preparedness intervention for earthquake-affected communities in Bhaktapur Nepal can - reduce mental health distress, enhance coping, and encourage increased engagement in preparedness. Others should consider similar intervention research designed to mitigate the effects of natural disasters in Nepal, and enhance community resistance.

As outlined here, the Nepali people are facing many post-earthquake challenges. However, Nepal is a nation that is resilient, having overcome many seemingly insurmountable obstacles in the past, including other natural disasters. Hopefully the coming years will provide an opportunity for the world to observe the spirit and resilience of the Nepali people as they build back better, providing an example of post-disaster recovery for the rest of the world to follow.

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