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Version: Accepted Version

Proceedings Paper:

Hall, M.L., Lee, A.C.K., Cartwright, C. et al. (2017) The 2015 Nepal earthquake disaster: lessons learned one year on. In: Public Health. Elsevier, pp. 39-44. ISSN: 0033-3506. EISSN: 1476-5616.

<https://doi.org/10.1016/j.puhe.2016.12.031>

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Title: Conference report: Nepal earthquake: lessons learned one year on.

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Key words: Nepal, Earthquake, Disaster

ABSTRACT:

Introduction

The 2015 earthquake in Nepal killed over 8,000 people, injured more than 21,000 and displaced a further 2 million. One year later, a national workshop was organised with various Nepali stakeholders involved in the response to the earthquake. The workshop provided participants an opportunity to reflect on their experiences and sought to learn lessons from the disaster.

Methods

135 participants took part and most had been directly involved in the earthquake response. They included representatives from the Ministry of Health, local and national government, the armed forces, non-governmental organisations, health practitioners, academics, and community representatives. Participants were divided into seven focus groups based around the following topics: water, sanitation and hygiene, hospital services, health and nutrition, education, shelter, policy and community. Facilitated group discussions were conducted in Nepalese and the key emerging themes are presented.

Results

Participants described a range of issues encountered, some specific to their area of expertise but also more general issues. These included logistics and supply chain challenges, leadership and coordination difficulties, impacts of the media as well as cultural beliefs on population behaviour post-disaster. Lessons identified included the need for community involvement at all stages of disaster response and preparedness, as well as the development of local leadership capabilities and community resilience. A 'disconnect' between disaster management policy and responses was observed, which may result in ineffective, poorly planned disaster response.

Conclusion

Finding time and opportunity to reflect on and identify lessons from disaster response can be difficult but are fundamental to improving future disaster preparedness. The Nepal Earthquake National Workshop offered participants the space to do this. It garnered an overwhelming sense of wanting to do things better, of the need for a Nepal-centric approach and the need to learn the lessons of the past to improve disaster management for the future.

Conference report: Nepal earthquake: lessons learned one year on.

INTRODUCTION

The April 2015 earthquake in Nepal killed over 8,000 people, injured more than 21,000 and displaced a further 2 million. One year later, in May 2016, a national workshop was organised that aimed to provide participants with an opportunity to reflect on their experiences and collate insights that could be used to inform response to and recovery from future disasters. Of note, this workshop's predominant focus was on understanding lessons learned from a Nepali rather than international perspective. We report here on the key emergent themes from the workshop and explore how these can contribute to Nepal's disaster preparedness and response for the future.

The key justification for this workshop is the need to capture learning from disasters in order to build the evidence base for disaster management.(1-3). It has been previously reported that there is a real paucity in the published academic literature on disaster management particularly from Low- and Middle-Income Countries (LMIC).(1) Indeed, a large proportion of the evidence-base consist of grey literature, mostly from programme reports and evaluations by non-governmental organisations. However, these are often poorly indexed and difficult to retrieve or trace. It is also difficult to validate the rigour of the data collection or objectivity of their reporting. Furthermore, disasters by their very nature are not easy to predict and study. The collation of insights and experience from disasters is therefore an essential post-disaster priority.

METHODS

The workshop was coordinated by Nepali and UK academics, a local and international NGO (PHASE Nepal and EcoHimal) and took place in the Nepal capital, Kathmandu. Nepali participants were invited from a wide range of backgrounds including community representatives, health and education professionals and government officials. 135 participants attended which included representatives from the Ministry of Health, local and national government, the armed forces, local NGOs, health and education professionals, community representatives and other specialists such as engineers or water and sanitation experts. Most of the participants were Nepali and the main language used was Nepalese. Although the majority of participants were male, there were female representatives on all groups.

The workshop was split into two formats with key note presentations in the morning and focused sector-based group discussions in the afternoon. The group discussions provided all participants the opportunity to share experiences and insights, and to provide suggestions for improving and developing future disaster response. The discussion groups were organised by theme and participants were placed in the particular group relevant to their expertise, knowledge or experience. In all there were seven groups clustered around: water, sanitation and hygiene, hospital services, health and nutrition, education, shelter, policy and community. Group discussions were facilitated and participants were encouraged to discuss the issues and difficulties encountered in responding to the earthquake and potential solutions or lessons to be learned if similar disasters were to happen in the future.

FINDINGS

Healthcare issues

In disaster-affected areas, service provision of health care was compromised. The destruction of village health posts in rural areas, compounded by the pre-existing lack of health workers, made the provision of even basic health care in the immediate aftermath difficult. Earthquake damage to hospitals meant that many staff and patients were too frightened to remain inside so patients waited, were examined and treated outside hospital buildings. There were also reports of a lack of ability to deal with the number of patients arriving for treatment as there were insufficient staff, equipment and medical supplies. Those working in rural areas also reported difficulties in referring patients on to more specialist centres due to landslides.

There were also issues with supplying health facilities in affected areas. Relief tents did not arrive until a few days after the earthquake. Medical supplies were either buried under damaged hospital buildings or staff were reluctant to retrieve them as buildings were felt to be too dangerous to enter. That said, some people were able to recover some medicines out of destroyed health posts. There were also anecdotal reports of supplies having been stolen on route. The government sought to address the medical supplies problem by providing funds to hospitals to purchase further supplies. However, it was felt that the direct provision of supplies instead of cash would have been more beneficial.

It was reported that although there were disaster policies and preparedness documents in place and many knew the theoretical approach required, when the earthquake happened it was very difficult to put the theory into practice. This was attributed to the lack of 'drilling' or exercises testing out

the theory before being needed for real. When it was tested for real by the earthquake disaster, staff were not prepared and disaster policies and protocols did not work. A lack of leadership and coordination amongst medical staff were identified to be some of the key issues. This led to suggestions that medical staff needed further training in leadership and management skills for disasters. It was also observed that in some areas where there were pre-existing links between local NGOs and villages aid in these areas could be more quickly mobilised.

Water, Sanitation and Hygiene issues

There were notable issues with water availability in the immediate aftermath of the earthquake. In urban areas, people were afraid to return to their houses to access water, or the lack of electricity meant they were unable to activate water supply machinery. In rural areas, many water sources dried up as a result of the earthquake and accessing enough water became the main focus of many rural villagers' lives. After the first couple of days, aid agencies supplied water tanks but there were questions regarding the quality of water supplied via the tanks and the lack of ability to test or be reassured of the water quality. Ongoing power supply issues affected those relying on pumps to source their water. It was also observed that hygiene practices, such as boiling water, were not considered a priority by most of the disaster-affected people. The lack of toilet facilities for those whose houses had been destroyed, or for those too afraid to return to their houses meant that open defecation was considered a big issue particularly in settlement areas before adequate sanitation could be built. Of particular note, pre-existing local cultural beliefs about human waste practices deterred some from digging their own sanitation facilities.

The role of the education sector

In the aftermath of the earthquake many people congregated in school buildings or on school land. Of note, many looked to the teachers to take charge of the situation. Many participants spoke of the role the teachers played in providing a calming and reassuring presence to others despite their own fears and uncertainties. This unique community leadership role in rural communities that teachers play, as was revealed by the disaster, highlighted a need to give the teachers adequate training and knowledge about what to do in the event of an earthquake. Moreover, as the school premises were used as a community focal point and refuge, it was felt that it was essential that school buildings are earthquake resistant.

The village school also played another important role – that of restoring a sense of normality to affected communities. Initially, schools did not open for some time after the earthquake as families dealt with more immediate concerns such as shelter and food. However, it emerged that children were often apprehensive or frightened particularly given the number of aftershocks experienced. When school was restarted, it was observed that just coming to school, even if not for any real lessons, helped to alleviate some of the fears the children had.

The lack of community awareness as to what to do in disasters and afterwards was also highlighted. This led to suggestions that disaster mitigation and response needed to be incorporated into the school curriculum.

Community resilience and engagement

External help often took several days to arrive that meant the disaster-affected communities had to look to themselves and their neighbours for aid. This highlights the importance of the communities' capacity for self-help and mutual support. However, it was also observed that NGO and government promises of aid could have led to dependency and 'victims' waiting for help rather than getting on and helping themselves. Public expectations were also greater than what resources were actually available, and they were concerned about the quality of donor goods distributed.

Consequently, there was a demand for better preparedness at the community level, for all disasters and not just earthquakes. A cohesive community was considered to be an essential resource for disaster response and recovery. A wide range of individual and community-level solutions were also offered for future disaster preparedness such as the establishment of local collection and storage points for aid, community warning systems and community-led clubs or groups responsible for immediate disaster response. Several groups also thought that communities having an essential store of goods 'in case of disaster' would be beneficial for use in any immediate aftermath until general aid was available.

However, it was felt that pre-disaster there was a lack of community-focussed disaster preparedness or planning. National policies were not always thought to be relevant and were patchily adopted and implemented. The participants felt that if there had been more involvement and engagement of the community in disaster preparedness and planning at a regional and national level, then the community could have responded and dealt with the consequences of the earthquake in a more efficient and organised manner. Participants felt that disaster response coordination and distribution of aid with community input, or the devolution of authority for decision making to

communities would have enabled a speedier and more targeted local response. The response would likely be more appropriate and would have been more likely to reach all affected communities including those 'at the end of the road' that were difficult to access by external agencies. Greater community engagement could also enable the development of links between community and national bodies, help to raise national awareness of local needs, and improve national confidence in local ability to receive and distribute aid.

Role of the Media

The public health role of the media was also discussed. It was noted that the media played a role in raising awareness around good hygiene practice post-disaster. However, in some instances, health promotion messages were misunderstood by the target population. For example, it was recounted how some people thought they had to ingest chlorine tablets before drinking 'unsafe' water. Similarly, pre-disaster risk reduction messages were also misinterpreted such as the advice given to the public to seek shelter under beds during an earthquake – there are reports of many who during the earthquake ran from the relative safety outdoor into their more unsafe homes in order to shelter under their beds.

The media could also have a negative role. Rumours about perceived inequities in aid distribution could also be compounded by the media that created tensions between communities who may or may not have received donations. Media-led stories around the likelihood of further earthquakes occurring also increased public anxiety. Some participants felt that this may in turn have contributed to increased mental health issues and adverse coping strategies such as alcohol and substance misuse.

Reconstruction challenges

The earthquake resulted in hundreds of thousands left homeless. With the impending monsoon season and winter afterwards, in the first few months after the earthquake shelter was seen to be a high priority. Moreover, it was widely acknowledged that there is a need to build more earthquake-resistant housing. However the reconstruction process has been challenging and there were criticisms of government reconstruction policies. For example, the government had bought tents instead of locally sourced building materials that was felt to be more sustainable. Government regulations could also impede rebuilding, such as the requirement for all health posts to be

accessible for the disabled but this was felt not to be always possible or appropriate particularly in mountainous villages. The lack of information of the physical geography of the affected areas also meant it was not possible to ascertain which areas were especially hazardous or 'safe' for rebuilding to be authorised. Most participants felt that reconstruction would be much more efficiently coordinated at a local level, including identification of those in need, rather than at the national or regional level. One agency had done this and felt reconstruction had run much more smoothly as a result.

Coordination and distribution of aid

The coordination and management of the many aid agencies was reported to be an issue. Difficulties in communication systems between rural and urban centres meant it took time to assess the extent of the damage and understand the relief or support that was needed. This was compounded by a lack of baseline information or knowledge on local need or resources. Instead a 'blanket' approach to relief provision was adopted by the government that meant that efforts to identify those in greatest need, or finding the most appropriate relief provision, were limited. As a consequence, it was reported that in some disaster-affected areas there was plentiful supply of food aid by different agencies but little awareness of where it should go or which areas should be prioritised to receive it. Similarly, there was a seed distribution intended for farmers but due to lack of baseline data about the number and type of farmers it is uncertain whether the beneficiaries given seeds were actually farmers.

Coordination issues were aggravated by communication and access difficulties between urban 'command centres' and rural villages. This situation was exacerbated by blocked roads due to landslides that hampered access to remote areas and added to delays in transporting aid or evacuating those who had been seriously injured. Transported goods did not always reach their intended end point, and there were anecdotal reports of aid being stolen, or items of aid being diverted from supply trucks at each village they passed through. The distribution of aid materials was further hampered by the fuel blockade that occurred between India and Nepal in the months after the earthquake which led to widespread fuel shortages within the country.

Some participants did report having seen good coordination between the local and central government. However, there was a feeling that the government had not been proactive enough in responding to the disaster. Supplies were sent when requested but there appeared to be little effort to proactively identify needs and to provide supplies in anticipation of requests. That said there was

some recognition of the immense difficulty face by the government to coordinate all of the disaster responses. It was thus suggested that the government could have devolved power to local governing bodies to use local resources that could have helped this process.

The need for preparedness and planning at all levels was reiterated. The lack of ready technical expertise and support was raised along with suggestions that an 'emergency response team' on constant stand by to respond to crises should be created. Other practical suggestions raised included the need for better data collection and coordination so that relief efforts could be more effectively deployed to the areas most in need, better use of existing resources such as medical staff and less bureaucracy so that external relief could be utilised quicker and more effectively.

As iterated above, there was also a need for leadership at both a local and wider level. In the absence of any obvious local leader, school teachers often appeared to step in, or be nominated to fill the vacuum, despite their own uncertainties or lack of perceived training for this role. In healthcare environments a perceived lack of leadership led to uncoordinated individual activities and no overall oversight or coordination.

Policy

Despite the presence of a national disaster response policy, most participants felt that this was a theoretical policy only with no relevance or applicability to real life in Nepal. The lack of community involvement in policy development and implementation was a recurring criticism. At present, policies were felt to be too centralised, impractical, disregarded vulnerable populations and lacked an evidence base. There was a view emphasised that any policy had to be based on the Nepalese context, culture and environment, and could not be simply transplanted from another country for use in Nepal as was suggested had happened. It was felt that the current disaster policy was based on the 'imaginings' of policy makers and not rooted in reality as they had not consulted or listened to 'victims' or those most likely to be affected by natural disasters. Natural disaster policies were also not felt to be a government priority with historical political instability hindering any efforts to produce effective outputs to reduce disaster risk and improve disaster response.

This 'disconnect' between national policy and local experience became apparent following the earthquake: both professionals and communities voiced their lack of awareness and knowledge about recommended 'procedures' and actions they should have taken following the earthquake. The lack of disaster response 'drilling' or preparedness meant that such gaps in understanding or awareness were not identified until the earthquake itself. All participants felt that any disaster

response policy or preparedness should be developed from the 'bottom upwards' involving and listening to communities and frontline staff before being formulated and tested extensively.

The differences between rural and urban experiences

Participants also discussed the disparities between rural and urban settings with regards to aid provision. There was a perception that those areas that had a relatively large number of tourists received aid more quickly and efficiently, and this generated some disquiet. The targeting of aid to certain population subgroups created further tensions within communities. Cultural beliefs meant that some did not come forward for relief as they believed that the aid was meant only for 'high class' people.

Response and experiences for rural and urban populations were very different reflecting the differing availability of resources before, during and after the earthquake, but also in terms of the different response to need in the two environments. Urban populations tended to be better able to access resources quicker despite initial problems in the immediate aftermath. A lack of understanding of needs, difficulty in communication and logistics, and a centralised approach to response meant that many rural populations did not receive support for several days.

In the reconstruction phase, although both communities have experienced difficulties in the reconstruction process, rural communities have had added difficulties in being allocated resources, receiving materials and dealing with regulations that are not always appropriate to a rural environment. Once again the need for greater community engagement was iterated so that local needs were better understood and addressed. Devolving more authority for community decision making was considered a good way of ensuring aid or reconstruction material reached those most in need.

Discussion

Participants identified a number of issues in the response to the Nepal earthquake that are common to disaster response worldwide. Effective coordination was a key theme. Clear, maintained leadership within both a healthcare and wider setting is crucial(4, 5) and their lack can prevent confusion or barriers to an effective response (6). The use of 'spontaneous' leaders, those who take on a leadership role during a disaster such as teachers following the Nepal earthquake, are a useful

resource and would benefit from recognition of this alongside disaster response training (7); some teachers took on this role in Nepal but did not always feel adequately prepared for it.

Logistical challenges often mean a time lag between the arrival of aid and the event (8) leaving local communities to respond to the resulting surge in demand in the best way they can (9). This is particularly the case for rural, hard-to-reach communities who may already have a pre-disaster lack of adequate health provision(10) and providing training and support for communities before any disaster can help to address this(11). In Nepal, logistical difficulties were compounded by the theft of aid provision en route to communities in need, providing support for the concept of having local storage capacity.

Enhancing disaster preparedness is a key priority of the Sendai Framework for Disaster Risk Reduction 2015 – 2020(12, 13). It features highly on an Evidence Aid list of research priorities (14) emphasising the importance that preparedness plays in reducing adverse outcomes following disasters. The need for community engagement in disaster response and preparedness is widely recognised (15)(16)(17, 18) with involvement bringing a variety of potential benefits including local storage capacity(19), local health response(20), and community-led health education and assistance(11). It helps ensure aid interventions are appropriate to the culture and community in which they are provided(21) recognising that certain solutions, such as encouraging communities to build their own latrines in Nepal, may not be culturally acceptable.

However the frequent disconnect between what is needed and what is written into policy is also widely recognised(6) resulting in an often ineffective, poorly planned disaster response (10). Preparedness requires planning at all levels(9), should be over extended timeframes(22) and should be extensively tested with drills and exercises(10). As was reported to have occurred in Nepal, this is not always the case and leads to poor coordination of response, poor leadership, unclear distribution of aid and an overall less effective, disjointed response(6, 16, 19).

Conclusion

One year on from the 2015 earthquake, this workshop provided an opportunity for participants to reflect on their experiences. Most were directly involved in the earthquake response and all had very personal as well as professional insights into what happened and how things could be different in the future. There was an overwhelming sense of wanting to do things better; reflections and discussions from this workshop are an important step in making this happen. Participants felt that some clear lessons were apparent: the need for community involvement at all stages of disaster response and preparedness, the need for leadership and coordination and the need for clear and

consistent communications both to identify need and to provide relief. Above all participants identified the need for a Nepali-centric approach that, whilst recognising good practice and evidence from around the world, is built around Nepali culture and context.

Ethics

Participants were informed in advance that the discussions would be collated for the purposes of collating this report. Signed participation consent forms were obtained. Ethics approval was sought and received from the University of Sheffield's Research Ethics Committee (reference 007966) on 14.3.16.

Declaration of interests

Author AL is an associate editor with the journal and received funding to cover travel costs to attend this workshop.

Contributorship and authorship statement

AL, SM and PS devised this workshop. JK and SM were involved in data collection. MH, AL, SM and CC analysed the data. MH and AL wrote the paper. The paper was reviewed by all authors.

Funding source

The workshop was funded by the Section of Public Health, the School of Health and Related Research, the University of Sheffield. Event organisation assistance was provided in kind by PHASE Nepal and Manmohan Memorial Institute of Health Sciences.

Acknowledgements

We would like to gratefully acknowledge the kind assistance provided by staff from PHASE Nepal, as well as staff and students from Manmohan Memorial Institute of Health Sciences, who assisted with the organisation and conduct of the event.

References

1. Lee ACK, Booth A, Challen K, Gardois P, Goodacre S. Disaster management in low-and middle-income countries: scoping review of the evidence base. *Emergency Medicine Journal* 2014;emermed-2013-203298.
2. Challen K, Lee ACK, Booth A, Gardois P, Woods HB, Goodacre SW. Where is the evidence for emergency planning: a scoping review. *BMC Public Health* 2012;12.
3. Bradt DA, Aitken P. Disaster medicine reporting: the need for new guidelines and the CONFIDE statement. *Emergency Medicine Australasia* 2010;22(6):483-7.
4. Burnweit C, Stylianos S. Disaster response in a pediatric field hospital: lessons learned in Haiti. *Journal of Pediatric Surgery* 2011;46(6):1131-9.
5. Merin O, Miskin IN, Lin G, Wisner I, Kreiss Y. Triage in mass-casualty events: the Haitian experience. *Prehospital and Disaster Medicine* 2011;26(05):386-90.
6. Lee A. Barriers to evidence-based disaster management in Nepal: a qualitative study. *Public Health* 2016;133:99-106.
7. Filmer LB, Ranse J. Who is my leader? A case study from a hospital disaster scenario in a less developed country. *Australasian Emergency Nursing Journal* 2013;16(4):170-4.
8. Hairapetian A, Alexanian A, Féris M, Agoudjian V, Schmets G, Dallemagne G, et al. Drug supply in the aftermath of the 1988 Armenian earthquake. *The Lancet* 1990;335(8702):1388-90.
9. Smith SM, Gorski J, Vennelakanti HC. Disaster preparedness and response: a challenge for hospitals in earthquake-prone countries. *International Journal of Emergency Management* 2010;7(3-4):209-20.
10. Fuady A, Pakasi TA, Mansyur M. Primary health centre disaster preparedness after the earthquake in Padang Pariaman, West Sumatra, Indonesia. *BMC Research Notes* 2011;4(1):1.
11. Woersching JC, Snyder AE. Earthquakes in El Salvador: a descriptive study of health concerns in a rural community and the clinical implications, part I. *Disaster Management & Response* 2003;1(4):105-9.
12. Aitsi-Selmi A, Egawa S, Sasaki H, Wannous C, Murray V. The Sendai framework for disaster risk reduction: Renewing the global commitment to people's resilience, health, and well-being. *International Journal of Disaster Risk Science* 2015;6(2):164-76.
13. UNISDR. *Sendai Framework for Disaster Risk Reduction 2015 – 2020*. Geneva: UNISDR, 2015 4.11.16. Available from: <http://www.unisdr.org/we/inform/publications/43291>.
14. EAPSG. Prioritization of Themes and Research Questions for Health Outcomes in Natural Disasters, Humanitarian Crises or Other Major Healthcare Emergencies. *PLOS Currents Disasters* 2013;1.
15. Sugino M, Dwi Hapsari E, Madyaningrum E, Haryant F, Warsini S, Takada S, et al. Issues raised by nurses and midwives in a post-disaster Bantul community. *Disaster Prevention and Management* 2014;23(4):420-36.
16. Restrepo HE. Earthquake in Colombia: the tragedy of the coffee growing region. Health impact and lessons for the health sector. *Journal of Epidemiology and Community Health* 2000;54(10):761-5.
17. Adhikari B, Mishra SR, Raut S. Rebuilding earthquake struck Nepal through community engagement. *Frontiers in Public Health* 2016;4:121.
18. Lee ACK. Local perspectives on humanitarian aid in Sri Lanka after the tsunami. *Public Health* 2008;122(12):1410-7.
19. Rajbhandari AK, Dhital R, Pradhan PMS, Subhani H, Shrestha SM, Subedi M. Aftershocks of a mega earthquake on occupational health in Nepal. *Annals of Global Health* 2015;81(4):482-6.
20. Steinman M, Lottenberg C, Pavao OF, Kanamura A, Aranha LFC, Cenderoglo M, et al. Emergency response to the Haitian earthquake—As bad as it gets. *Injury* 2012;43(3):386-7.
21. Karmakar S, Rathore AS, Kadri SM, Dutt S, Khare S, Lal S. Post-earthquake outbreak of rotavirus gastroenteritis in Kashmir (India): An epidemiological analysis. *Public Health* 2008;122(10):981-9.

22. Peranteau WH, Havens JM, Harrington S, Gates JD. Re-establishing surgical care at Port-au-Prince general hospital, Haiti. *Journal of the American College of Surgeons* 2010;211(1):126-30.