

Public Health, Prevention and Health Promotion in Post-Earthquake Nepal

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Situated on the meeting point of the Indian sub-continent and mainland Asia, Nepal is very much an earthquake-prone country [1]. Eight centuries ago the first recorded earthquake killed one-third of people living in Kathmandu Valley in 1255 and the country has suffered major earthquakes regularly since. Prior to this year's devastating earthquakes there have been serious earthquakes over the past century in 1934, 1980, 1988 and 2011. The recent two major earthquakes in April and May 2015 resulted in nearly 9,000 deaths and a further 23,300 injuries and these figure continue to rise [2]. This year nearly 594,000 homes were destroyed and another 280,000 damaged, 75% of which were private dwellings [1,3]. Consequently, over 8 million people, including 1.1 million children have been affected by this disaster [3], with 14 district of central and western Nepal hit the hardest. In addition, there was widespread physical damage estimated to reach billions of dollars. Repairs are needed to infrastructure (e.g. roads and health posts) and services including public utilities (e.g. water, sewerage, and electricity). Recent damages have often been greatest in the more remote districts hindering relief and repair work locally. Millions of people are now homeless and living in the open, or in overcrowded shelters assembled for internally displaced people (IDP). A number of landslides triggered by rainfall on fragile landscapes have blocked the highways and disrupted transport, with some communities subjected to relocation.

Apart from earthquakes landslides are also common; annually 12,000 big or small landslides occur in Nepal [4]. Landslides have become more frequent, and over 3,000 major landslides have been recorded after the first earthquake in April. Additional landslides are expected due to the instability of the soil after the earthquake [3]. As a consequence many rural communities remain isolated and do not benefit from relief and recovery activities.

The immediate impact of a disaster often requires emergency relief such as shelter, water supply, road networks, and services. However, in Public Health we are trained to think longer-term. The collapse of building providing health services during disasters and that of healthcare systems afterwards can have a prolonged impact on the health and well-being of affected communities. Longer-term effects can involve the disruption of surveillance and health interventions (immunisation and vector control programmes), reduced productivity or the destruction of local farming (resulting in food scarcities), or the breakdown of local health and social services, resulting in an increase use of unprescribed medications. The Government of Nepal, in its post-disaster need assessment, estimated a total damage of 5.2 billion US\$ across different sectors [1]. In terms of non-structural damage, almost all of the additional healthcare costs are associated with non-fatal injuries [5] many are clearly unaccounted, so far.

The direct costs of treatments injuries caused by earthquake along with indirect costs should be calculated in order to measure the possible increase in poverty. This knowledge will fill the gap to feed into post-disaster health recovery strategy.

The risk factors for increased infectious disease transmission and subsequent outbreaks are common after-effects following the primary disaster. These after-effects include displacement of populations (IDPs/refugees), poor mental health (including increased rates of depression), environmental changes and increased vector breeding sites (e.g. increased risk of malaria). Poorly planned and overcrowded shelters, reduced water quality and sanitation, lack of food or personal hygiene can lower levels of immunity to vaccine-preventable diseases, increasing the risk of outbreaks of communicable diseases. The earlier mentioned damage to health services infrastructure may lead to insufficient vaccination coverage and, of course, limit access to remaining health care services. Whilst living overcrowded temporary shelters can increase the risk of sexual harassment and abuse, especially of the most vulnerable people.

The Public Health consequences of the Nepal 2015 earthquakes have been significant. More than 1,000 health facilities, mostly village health posts in hard-to-reach areas have been destroyed. For example of the 351 facilities with Emergency Obstetric, Maternal and Neonatal Care before 2015, nearly one third (n=112) has been destroyed and 144 are damaged [6]. UNICEF estimated that "12 babies born every hour without basic healthcare in worst hit areas" [7]. With so many people injured during the recent earthquakes, rehabilitation services are critical, particularly when a system of Emergency Medical Services (EMS) has not yet been developed.

Natural disasters are an important public health problem and any interventions should aim to reduce their impacts from a health promotion perspective by improving the health system. A recent literature review has demonstrated how a health promotion framework may be applied to the work of disaster management [8]. It has illustrated the contribution that health promotion strategies can make to increasing resiliency and reducing vulnerability, in order to minimise the impact of disasters on people and their health. Similarly another review identified how strengthening health systems promotes resilience and potentially a more efficient post-disaster recovery [9].

It is essential to continue life-saving maternal, newborn and child health (MNCH), including antenatal, delivery and postnatal care; newborn care; and routine immunisation to prevent the outbreak of vaccine preventable diseases. Special

attention should be given on reproductive health care services including EmOC, and prevention the sexual exploitation. Strengthening surveillance systems of water and vector borne diseases including outbreak control measure is crucial in humanitarian crises. Such initiatives must be supported by healthy public policy, including inter-agency cooperation and multi-sector involvement, in order to comprehensively address all determinants of vulnerability. These strategies should be supplemented by those which develop personal skills, through education and the exchange of information about risk, to enable individuals to make decisions which safeguard their health and livelihood. A key aim of disaster management should be the focusing of interventions on equity to help reduce existing inequalities and ensure that these are not made worse post disaster. Unfortunately, there is limited evidence on effective interventions. This requires evidence generation; through case-series, cross-sectional, case-control or cohort studies in order to address uniqueness of each disaster and affected population [10].

People living in seismically active regions like Nepal will see another earthquake sooner or later. Whilst smaller disasters like landslides are bound to be affected by issues such as land use and climate change. Policy makers and public health practitioners need to be aware of and educate others of epidemiology, health impact assessment and preventive measures associated to earthquake and other disasters [10]. Moreover, there is an urgent need for comprehensive health promotion programmes including the management of non-communicable diseases, disabilities, mental health and injury rehabilitation through the provision of essential medicines and supplies, and rehabilitation of damaged health facilities integrating disaster risk reduction strategies. Community action is fundamental to reducing the impacts of disasters, which should incorporate crisis planning covering the following stages: mitigation/prevention, preparedness, response and recovery [11]. Prior to this year's major earthquakes we concluded that there was a huge gap in coordination and collaboration of health promotion efforts in Nepal [12]. This situation resulted in many organisations working on the same health problem and/or same geographic region. Such duplication of efforts is likely to increase in post-disaster Nepal unless coordination and planning of the rebuilding is taken seriously. Finally, repairing and improving health systems in Nepal needs to be evidence-based and where possible supported by research to help strengthen the Public Health evidence base. Such evidence-based approach should help establish more effective interventions in future humanitarian crises.

Conflict of interest:

The authors hereby declare that they have no financial or non-financial potential conflicts of interest.

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