

Earthquake Aftermath-Myth or Reality?

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A number of infectious diseases have been ascribed to natural disasters such as earthquakes, floods, tsunamis, hurricanes, typhoons and tornadoes. These include diarrheal diseases, acute respiratory infections, malaria, leptospirosis, measles, dengue, viral hepatitis, typhoid fever, meningitis, tetanus, cutaneous mycoses and very rarely systemic fungal diseases localized to certain geographical locations [1].

In the aftermath of the recent devastating earthquake in many parts of Nepal, there was panic and confusion amongst the victims with the apprehension of possible outbreak of infectious diseases. Though injuries during or shortly after an earthquake give rise to fractures, lacerations, blunt trauma, crush injuries, projectile injuries, burn injuries and drowning [2], the potential risk of infectious diseases transmission and outbreaks after a natural disaster like earthquake is not high enough, unless there is substantial population displacement [2]. There is also little evidence to support the view that dead bodies pose a significant risk for infectious diseases transmission and outbreaks, especially when deaths can directly be attributed to the earthquake. Dead bodies only pose health risks in certain situations that require specific precautions, such as deaths from cholera [3,4] or hemorrhagic fevers, due to viruses like Ebola, Marburg, and Crimean Congo Hemorrhagic fever etc. [5]. More often, the source of acute infections is more likely to be from the survivors rather than from the corpses [5]. However, recommendations for management of dead bodies are to be stringent as per the guidelines laid down by the competent authorities [6]. Despite these facts, the risk for outbreaks of infectious diseases after

an earthquake is frequently exaggerated, and imminent threats of epidemics remain a recurring theme in many places because of the occurrence of similar disasters in the past [5].

Nevertheless, an upsurge in the transmission of infectious disease and outbreaks following natural disasters are associated with prolonged after-effects of the earthquake. These after-effects include displaced populations (internally displaced persons and refugees), environmental changes, increasing vector breeding sites (artificial collections of water), high exposure to and proliferation of disease reservoirs and vectors (rodents, mosquitoes), unplanned and overcrowded shelters, poor water and sanitation conditions, poor nutritional status and poor personal hygiene, low levels of immunity to vaccine-preventable diseases or insufficient vaccination coverage, and limited access to healthcare services. These changes, in human conditions, in the ecosystem of pathogens and in the environment, facilitate the occurrence and transmission of infectious diseases.

Therefore, post-disaster risk assessment and rapid implementation of control measures through primary healthcare delivery are very essential in situations where pre-disaster surveillance data are not available.

In any post-disaster scenario, it is the interplay between some or all of the following factors that ultimately influence the risk for communicable diseases. These include availability of safe water and sanitation facilities, the degree of crowding, the underlying health status of the population, and the availability of healthcare services. The goal of an emergency health care

system should be to prevent and control epidemics as well as to improve deteriorating health conditions among disaster victims in order to minimize death toll in the affected population. Ensuring uninterrupted provision of safe drinking-water is the most important preventive measure to be implemented following a natural disaster. Chlorine is widely available, inexpensive, easy to use and effective against many waterborne bacteria and parasites.

Communicable diseases are most commonly encountered amongst displaced populations that have poor access to above mentioned basic needs such as safe water and sanitation, adequate shelter, and primary healthcare. Assuring access to safe water and primary healthcare services is crucial, as are surveillance and early warning to detect epidemic-prone diseases known to occur in the earthquake affected area.

A probable climate change following a major earthquake could affect the ecology of some micro-organisms such as pathogenic fungi in ways that are not yet fully understood [7]. For example, warmer average global temperatures may allow the geographic range of fungi typically restricted to tropical and subtropical belts, such as *Cryptococcus gattii*, to expand into areas that are currently more temperate [7]. Global warming has also been hypothesized for selection of fungi with increased tolerance to warmer temperatures [7].

Health care providers should be aware of the possibility for cases or clusters of community-acquired or health care associated fungal infections among disaster survivors because these infections may often be clinically indistinguishable from bacterial infections and can be associated with serious morbidity and mortality. Following a disaster like earthquake, these infections can occur in persons who are not even immunocompromised, but who have experienced near-drowning, trauma, or other unusual exposure to the environment, such as inhalation of dusts from a broken building or monument. A high index of suspicion for fungal infection should be raised, if a patient has a persistent or progressive infection that is not responding to initial antibacterial therapy.

Access to primary health care is critical in preventing many infectious diseases, in the early diagnosis and treatment of a wide range of infections, as well as in providing an entry point for secondary and tertiary care. The immediate impact of communicable diseases can be mitigated with active interventions in cases with diarrheal diseases, acute respiratory infections particularly in children less than 5 years of age and in the elderly, malaria in any age group in an endemic area. This is in addition to ensuring the availability of adequate treatment and prevention for various other communicable disease threats.

Health care providers should also ensure proper wound cleaning and care. Tetanus toxoid with or without tetanus immunoglobulin, as appropriate, should accompany wound management. Easy and prompt availability of minimum essential drugs e.g. oral rehydration salts for management of diarrhoeal diseases, antibiotics for acute respiratory illnesses should be ensured. Health education messages, including: – encouraging good hygienic practices; – promoting safe food preparation techniques; – ensuring boiling or chlorination of water; – encouraging early treatment seeking behavior in case of fever; – encouraging use of insecticide-treated mosquito nets as a personal protection measure in malaria-endemic areas should be propagated.

Mass measles immunization together with vitamin A supplementation are immediate health priorities following any natural disaster in areas with inadequate coverage levels. The priority age groups are 6 months to 5 years and up to 15 years if resources allow. Current typhoid vaccines are not recommended for mass immunization campaigns to prevent typhoid disease. Typhoid vaccination in conjunction with other preventive measures may be useful to control typhoid outbreaks, depending on local circumstances. Hepatitis A vaccine is generally not recommended to prevent outbreaks in the disaster area. The cost of the cholera vaccine, and the logistic difficulties involved with the administration, have prohibited its widespread use. Although helpful in specific circumstances, it should not be viewed as a replacement for the provision of adequate water and sanitation. The usefulness of the cholera vaccine, relative to other public health priorities, has not been evaluated in disaster-affected areas.

Conflict of interest:

The author hereby declares that he has no financial or non-financial potential conflicts of interest.

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