Implementation of a Disaster Coordination and Communication Plan in Nepal: Hub and Satellite Concept

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Introduction: One lesson learned from the 2015 Nepal earthquake was the need for a more coordinated effort between hospitals to improve disaster response. To improve the coordination, the concept of a hub and satellite system was introduced.

Aim: Describe the implementation of a hub and satellite system in the disaster management plan to improve coordination and communication between hospitals and the health system during a disaster.

Methods: A standard hospital disaster management plan was developed and validated with governmental and non-governmental agencies. Twenty-five hub hospitals within Nepal were identified. Smaller hospitals surrounding hub hospitals were identified as satellite hospitals. A plan was made to address communication and coordination between hub-satellite hospitals and ministry of health involving resource sharing, capacity analysis, and development of deployment teams in each hub. An output-based workshop was planned. Each hospital's existing plans were evaluated before the workshop with a checklist containing essential components of disaster management. Each hospital was oriented and allowed to fill up a standardized template of a disaster management plan, after which their disaster management plan was reevaluated. The newly developed plan was then tested with a tabletop exercise function. The trainings were conducted from September 2017 to October 2018.

Results: Disaster management plans were made in 110 hospitals, including nine hub hospitals and 101 satellite hospitals in three of seven provinces in Nepal. Evaluation of a pre-workshop score for the existing disaster plan was 18/32, and the score of the disaster plan post-workshop was 30/32 on average. The average score for hospitals for the tabletop exercise was 68.2% (53.8% to 84.6%).

Discussion: A hub-satellite system-based disaster management plan has been developed and implemented in more than 100 hospitals in Nepal. Workshops for these hub and satellite hospitals improved their communication, coordination, and planning to improve disaster preparedness and future response.

Life Expectancy Negatively Correlates with Disaster Risk Index

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Introduction: Sendai Framework for Disaster Risk Reduction 2015-2030, for the first time, describes how disaster affects the health of people. Japan is prone to natural hazards, but at the same time, Japan has achieved one of the highest life expectancies (LE) in the world. After experiencing many disasters, Japan seems to have achieved resilience against disasters. Thus, we tested a hypothesis that high LE correlates with low disaster risk.

Methods: We compared LE from the World Health Organization's (WHO) Global Health Observatory and the Index for Risk Management's (INFORM) disaster risk index, or World Risk Index (WRI), of each country using JMP software. INFORM risk index varies from 0-10, while WRI varies from 0-1, where a higher value means higher disaster risk in both systems. INFORM risk index considers hazard and exposure, vulnerability, lack of coping capacity, and lack of reliability. WRI considers exposure, susceptibility, lack of coping capacity, and lack of adaptive capacity, including logarithmized LE as a part of adaptive capacity.

Results: The overall INFORM risk index was negatively correlated with LE (p<0:0001). Although natural hazard did not correlate with LE (p=0.7), the human hazard, vulnerability, and lack of coping capacity negatively correlated with LE (p<0.0001, respectively). Health-related indicators, which confirm the vulnerability and lack of coping capacity, were negatively correlated with LE. Cluster analysis of LE and INFORM risk of six categories resulted in four clusters of countries, suggesting that health development and disaster risk reduction are independent determinants. WRI also correlated with LE, but there are many outliers compared to the INFORM risk index.

Discussion: High LE can be a good complementary indicator of low disaster risk. Strategies to achieve better health that contribute to high LE are also effective and important strategies for disaster risk reduction.

Medical Coordination Rescue Members' and Ambulance Nurses' Perspectives on Emergency Mass Casualty and Terrorism Preparedness in the Netherlands - A Qualitative Study

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Introduction: Mass casualty incidents, specifically incidents with chemical, biological, radiological, and nuclear agents (CBRN) or terrorist attacks, challenge medical coordination, rescue, and ambulance care. Recently in the Netherlands, a new model for emergency preparedness for large-scale mass casualties and a specific approach dealing with terrorist attacks was introduced (2016).

Aim: To provide insight into the first experiences with this approach in order to identify strengths and pitfalls.

Methods: The study had a qualitative design and was performed between January 2017 and June 2018. A semi-structured interview included topics that were selected based on available literature. All interviews were typed out verbatim and were analyzed using a structured approach of labeling and clustering of the response.

Results: The main issues raised by the respondents included the following:

- The interpretation of definitions introduced in the new model for the mass casualty preparedness model and the terrorist attack approach differed among respondents.
- All respondents supported the six points of departure in the CRBN and terrorist attack approach.
- Awareness of optimal personal safety ('safety first principle') specific for CBRN and terrorism is lacking.
- Respondents reported that several rescue workers did not feel competent to perform specific newly introduced tasks, such as the command and control of the first ambulance arriving at the scene and the coordination task of emergency transport by the dispatch nurse.
- Current regional differences in preparedness may complicate interregional collaboration.

Discussion: As the approach is new and experience is primarily based on the outcome of exercises, the systematic planning and evaluation of exercises, and sharing of opinions and knowledge, as a result, is important to ensure an unambiguous approach in a real situation.

Relating the All Hazard Approach of Hospitals to that of Public Authorities

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Introduction: Hospitals and the healthcare sector suffer from chronic work overload and personnel shortages in many nations. This poses strong incentives to rationalize all activities not directly related to care, such as the preparations for disasters and other hazards. One such rationalization is to turn from a rule-based to a risk-based approach. However, the risk landscape of hospitals and the relationship to the risk landscape of public authorities are ill-defined. Health Care Coalitions (HCCs) are in a good position to fill this gap and serve as an intermediary. We developed a scheme for defining the risk landscape of HCCs and its members and performed a prioritization process.
Aim: Objectives were to develop a knowledge platform of hospitals on risk assessment, promote integrated risk management by the HCC and its members, and determine the limiting (response) state for all relevant hazards.
Methods: We put maximum effort in limiting the time consumption for hospitals and align with the regular practices in hospitals for business continuity management. Strong points included the cooperation with the public authorities for safety and for health, a stepwise development of risk awareness and stepwise guidance for the assessment by hospitals, and formalization of the scenario-selection and choice of priorities by the HCC board.
Results: A gross list of (>230) safety hazards was produced along with a netlist of (>80) hazards relevant to health care.

In addition, an impact-scale for the continuity of care serving as a measurement stick for all health care sectors was developed. Risk diagrams were developed to present the results in a simple and clear format.
Discussion: The HCC risk landscape served its purpose in improving the mutual understanding with the public authorities. The formal assessment provides a solid basis for operational planning, education, training, and future investments.

Safer Hospitals in North Queensland - Assessment of Resilience

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Introduction: Hospitals are fundamental infrastructure, and when well-designed can provide a trusted place of refuge and a central point for health and wellbeing services in the aftermath of disasters. The ability of hospitals to continue functioning is dependent on location, the resilience of buildings, critical systems, equipment, supplies, and resources as well as people. Working towards ensuring that the local hospital is resilient is essential in any disaster management system and the level of hospital resilience can be used as an indicator in measuring community resilience. The most popular measure of hospital resilience is the World Health Organisation's Hospital Safety Index (HSI) used in over 100 countries to assess and guide improvements to achieve structurally and functionally disaster resilient hospitals. Its purpose is to promote safe hospitals where services "remain accessible and functioning at maximum capacity, and with the same infrastructure, before, during and immediately after the impact of emergencies and disasters." It identifies likely high impact hazards, vulnerabilities, and mitigation/improvement actions.
Aim: The HSI can be a valuable tool as part of the 2015-2030 Sendai Framework for Disaster Risk Reduction. However, to date, it has been used infrequently in developed countries. This project pilots the application of the HSI across seven facilities in a North Queensland health service (an area prone to cyclones and flooding), centered on a tertiary referral center, each providing 24-hour emergency health services.
Results: Key indicators of resilience and the result of the audit will be discussed within geographical and cultural contexts, including the benefits of the HSI in augmenting existing hospital assessment and accreditation processes to identify vulnerabilities and mitigation strategies.
Discussion: The research outcomes are to be used by the health service to improve infrastructure and provide anticipated community benefits, especially through the continuation of health services post disasters.