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Review On Healthcare Disaster Preparedness And Resilience

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Abstract:
Healthcare disaster preparedness is a pressing need that can be forecasted and plans for disaster prevention, mitigation, response, and recovery may be implemented. Healthcare disaster readiness aims to improve the preparedness and response time of disaster relief professionals and volunteers at all levels, both before and after disasters. Prior to improving communication and planning, it is always necessary to determine the roles and duties of healthcare personnel. During every public health emergency, timely training, retraining, and community inclusion are also critical considerations. The goal of this study is to determine an organization's and an individual's needs for disaster preparedness training in the Indian setting, as well as to make recommendations for future improvements. It would also address the need of sustainable strategies and reaction activities to address concerns related to hospital readiness and resilience.

Keywords: Healthcare Disaster, Disaster Preparedness, Resilience, Catastrophic Health Events (CHE)

INTRODUCTION

People all around the world are exposed to a vast list of dangers related to health emergencies due to natural disasters and manmade emergencies. These disasters include outbreaks of infection, earthquakes, floods, battles, water and food contamination, nuclear, biochemical and radiation exposures, collapse of building, road traffic accidents, water pollution, noise pollution, air pollution, antibiotic resistance, electronic waste etc.[1] These disasters can have disastrous health, economic, political, and societal implications. Global warming due to climatic variations, rapid urbanization, surplus growth in population, antibiotic resistance are various factors result into the increase prevalence and severity which lead to disaster emergencies and disaster risk management is both ineffective in the short and long term.[2]

The term disaster, like remedies, has multiple definitions in the context of Community Health. The large open natural hazards have resulted in global catastrophes that even health specialists have had difficulty combating or even reducing their impact. According to the Asian Disaster Center, a disaster is a substantial disturbance in the operation of a community or society that results in widespread individual, logistics , financial, or natural resources losses that exceed the afflicted group's or society's ability to deal with using its own resources.[3]A prepared system would be able to provide care for the sick and injured, safeguard the healthy, and sustain basic healthcare services for the general population in the case of a Catastrophic Health Event (CHE). To deal with a CHE, the system would be able to tap from all available national public and private resources.[4]

Proper healthcare disaster preparedness system helps to reduce the number of deaths and alleviates hazardous effects of disaster on society by initiating the ability to respond aptly and quickly during the Catastrophic Health Event (CHE).Even post disaster, the essential health care services would be resumed to general public soon, if there is well prepared healthcare disaster management system.[4] The impact and risk of disaster emergencies affects overall to all affected districts, states, nations and worldwide. Resilience of healthcare system post disaster is again a major challenge on communities, countries and at global levels, so it is vital to be prepared for such emergencies. Even Sustainable Development Goals (SDGs), Paris Agreement on Climate Change (Paris Agreement), International Health Regulations (IHR), Universal health coverage (UHC), Sendai Framework for Disaster Risk Reduction have an important goal to develop sound disaster management policies and strategies to minimize risks at regional, national and international levels to secure growth and development.[5]

Various frameworks have been laid down to reduce disaster risk. Even the Health EDRM ("health emergency and disaster risk management") have proposed global standard language and extensive framework to minimize the disaster risk outcomes on health emergencies. Proposed framework can be adapted across all sectors including healthcare sector to reduce disaster related risks. [5]

INCREASE OF DISASTERS WORLDWIDE

The most common disaster emergencies reported worldwide are road traffic accidents, cyclones, earthquakes, floods, thunderstorms, chemical blasts, industrial hazards, windstorms. Approximately over 77,000 have lost their lives and 190 million population are afflicted by natural and manmade disaster emergencies annually.[6] Even wars among nations distress the lives of 172 million people worldwide annually.[7] Emerging trend of rise in infectious outbreaks is recorded by WHO from 2012 to 2017, almost 168 countries have documented new or reoccurrence of 1200 infectious outbreaks. Over 2.6 billion people has been affected by natural disasters in last 20 year.[8] WHO further tracked reoccurrence of 352 new infectious diseases like Ebola virus and Coronavirus in 2019.[9]

Like any other country, India is also susceptible to risk of disasters based on geographical location and climatic conditions. According to Census 2011, India has around 3,287,240 sq. km. of geographical area. Even India is ranked seventh in number among all the countries in the world based on its geographical area. India is composed of 36 entities (28 States and 8 Union Territories), out of which 25 entities are in the vulnerable risk of disasters. Disasters that make India extremely at risk includes earthquakes, floods, cyclones, tsunamis, landslides, avalanche etc. About 59% of India's land area is susceptible to earthquake, 12% is vulnerable to floods and 76% of coastline area is prone to cyclones and tsunamis, 68% of agricultural area is vulnerable to drought and hills are subjected to avalanches and landslides. Global warming, natural resources overutilization and steadfast urbanization is further taking a toll on increase in the number of infections and natural disasters.[10]According to the UN Office for Disaster Risk Reduction has reported around 79,732 deaths and affected around 108 crore of Indian population due to 321 incidences of natural disasters.[10] Outbreak of remerging infections, most recent calamity of COVID-19 pandemic took a huge troll of deaths and took a great challenge to minimize its pred due to worldwide connectivity and its high rate of spread, which further emphasize the need of sound disaster risk management worldwide.[11]

IMPACT OF DISASTER ON HEALTHCARE AND ECONOMY

Disasters have a huge financial impact, annually loss in cost around US$ 300 billion is due to natural and manmade disasters, which is second to the cost invested in loss of dollars' worth trillions resulted due to conflicts among nations.[8,9] Annually worldwide almost US$500 billion which is around 6% loss of GDP occurs in commerce, travel and economy due to risk of pandemic.[12] Globally in 2013, almost US$ 225 billion loss in labor income have been reported due to premature deaths, the main reason behind it was air pollution.[13]

Allocation of budget of countries for disaster preparedness, reaction and convalescence globally is less than 50 %, according to WHO 2007.[14] The financial loss globally has raised sevenfold in year 2010 since 1970, due to natural and technological hazards. Globally in 1970, US$ 49 million loss was due to disasters, but in 2010, it has rose to annually US$ 383 million loss per day. United Nations Environment Programme (UNEP), have reported annually loss of US$ 50,000 million in economy the due to rise in destruction and number of deaths caused by disasters, both natural and manmade. Even in Covid 19 outbreak in its early stage, during complete lockdown of initial 21 days have approximately resulted into the loss of almost US$4.2 billion (32,000 crore) per day in economic growth of India.[15,16] Only approximately US$2.8 trillion economy was functional during COVID lockdown, which is less than one fourth of India's total economy.[17]

DISASTER MANAGEMENT CYCLE STAGES

Disaster management can be categorized into three stages and all of these stages are interlinked. Various stages are: • Pre-impact stage (Pre-disaster Prevention, Mitigation and Readiness stage) •

Impact stage (Operational and Reaction stage) • post-impact stage (post disaster Convalescence and Rehabilitation stage).[10]
In each of these phases various activities take place which are shown in Figure 1.

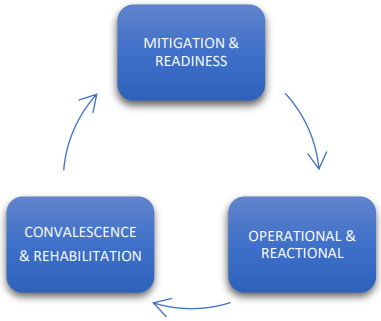

Figure 1: Disaster Management Cycle Stages Source: www.nidm.gov.in

- Pre-impact phase (Readiness stage). Pre-impact efforts include things like conducting awareness campaigns, maintaining a strong infrastructure for emergency, formulating emergency preparedness at the hospital, household and community levels, and so on. At this level, risk reduction initiatives are referred to as prevention and readiness actions.
- Impact phase (Reactional stage). Impact stage includes steps taken to guarantee that victims' requirements and resources are addressed, as well as their distress is reduced to minimum. Emergency and rapid services are the operations that are carried out at this time.
- Post impact phase (Convalescence stage). Aftermath of an impact of any emergency incident, activities are started with the purpose of facilitating rapid rehabilitation process of afflicted populations. These are referred to as reaction and recovery actions.[10]

DISASTER MANAGEMENT FRAMEWORK IN INDIA

India established the National Disaster Preparedness Model in 2004 to deal with disasters, emphasizing the interconnectedness of the business industry, climate changes and growth. Economic development, workforce development, public participation, as well as other fundamental aspects like disaster risk mitigation or protection, such as contingency planning, rescue, then rehabilitation, are also linked in this model. The Disaster Management Act 2005 and the National Policy on Disaster Management 2009, both enacted by the Parliament of India, established a comprehensive, legal and institutional framework for emergency planning, prevention and control of disasters in India.[10,18]

The Prime Minister of India, the highest authority in charge, chairs the National Disaster Management Authority (NDMA). The authority formulates disaster management policies, plans, and guidelines, as well as supervising respective compliance and execution across the nation.

Central Government, State, local governments, and regional administrations are guided from NDMA 's policies and guidelines in building their own activities and strategies for disaster management. The Nationwide Policies, as well as the strategies of the various Agencies and Ministries of India, are approved by the NDMA. The National Disaster Response Force has been entrusted to the NDMA, and it will be under its administration, guidance, and command (NDRF). The Central Government's Ministry of Home Affairs (MHA) is in authority of catastrophe planning and response in the nation. [10,18]

The Chief Minister leads the State Disaster Management Authority (SDMA), which establishes state's strategies and legislation for catastrophe management. It is also in responsible of coordinating the State Project's execution, suggesting financing for abatement and readiness initiatives, and reviewing the strategies for improvement of the various State stakeholders to assure that mitigation, readiness, and remedial actions are all linked. The state's main body for disaster management is the State Disaster Management Authority (SDMA), which is largely housed in the revenue and relief department. At the local district level, the District Magistrate leads the District Disaster Management Authority (DDMA), with the congressperson of the local government serving as Co-Chairperson. DDMA is the planning, coordinating, and implementation organization for disaster management at the district region.[10,18]The framework is depicted in Figure 2.

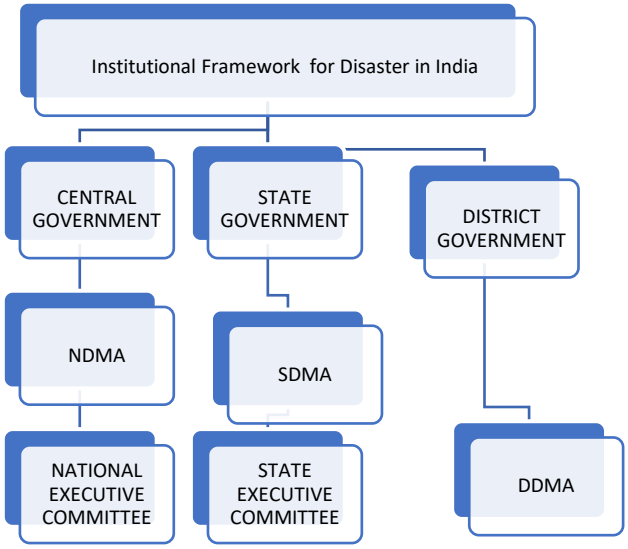

Figure 2: Institutional Framework for Disaster Management in India.

CHALLENGES TO HOSPITAL PREPAREDNESS DURING CATASTROPHIC HEALTH EVENTS

The kind of catastrophe and the incidence define the effect of a catastrophic health event (CHE) upon healthcare. Spontaneous catastrophes, like as seismic events, represent a larger health hazard than catastrophes that develop gradually. The current and prospective medical issues resulted from the accident are heterogeneous, that do not even emerge simultaneously. Poor nutritious diet, unclean drinking water, improper hygiene, improper sewage disposal, non-psychological wellbeing, climatic vulnerability, improper housing, contagious infections, lack of essential services and mass migration all have the potential to cause health issues.[10]

1.HOSPITAL CO-ORDINATION, COMMUNICATION AND COALITIONS

During CHE, fatalities are several significantly greater, facilities will indeed be wrecked, and crisis coordination will also be severely affected. The initial hours as well as days following a CHE will indeed be hectic, with inadequate hospital insight and communications systems; crisis controllers will just be overworked; and collaboration will then be challenging.[19] Horizontal collaboration as well as communication among adjacent health - care alliances, as well as cross-state links, have yet to be created in the majority of sites. Vertical ties between healthcare coalitions and national, state-regional, and district leaders should be supplemented by horizontal communication efforts.[20]

2. RESOURCES UTILISATION

CHE can seriously harm health-care institutions, water sources, and sewage systems. The harm might significantly impede health-care systems' ability to deliver healthcare to patients when it's really required. Either caregiver and patients are put at risk when the structure of the facility deteriorates. Health-care facilities' supply lines (hospital instruments and pharmaceutical consumables) is frequently disrupted. Due to limited road access, catastrophe victims have a difficult time reaching health care facilities. It is also possible that relief agencies will have difficulty accessing vulnerable populations.[10] Frameworks should be laid in way to achieve real - time information of the medical response (such as, patient number, patient's category for care, bed availability, staff availability, transportation availability, and so forth) and synchronized decision making regarding the allotment of limited resources (e.g., healthcare personnel, facilities, and supplies), quality of medical care, and find substitute care services. Presently there are no frameworks to accomplish the real - time information requisite for nation - wide synchronization of governmental and non - governmental medical services, supplies, coordinate and monitor reserves, or aid in the challenging clinical decisions demanded during catastrophic event.[21]

3. COMMUNITY BASED COLLABRATION

Descriptive Framework highlighted the importance of community partnership within and between health care system establishments in major catastrophic incident readiness. The importance of such collaboration is emphasized in the Medical Surge Capacity and Capability (MSCC) Handbook, Joint Commission guidelines, and Healthcare Preparedness Program (HPP) recommendations. Healthcare establishments will not be able to give optimal response during

catastrophic event unless a framework for integrating the activities of innumerable action aid establishments is in one place.[19,20,22]

4. TRIAGE AND PATIENT DISPLACEMENT

During CHE operations, hospitals' top priorities must be the health of previously hospitalized patients, including the triage as well as prompt transitional containment of inbound patients. Inbound patients should always be transported as soon as possible to certain other, minimally affected health facilities; throughout many cases, this will necessitate a handover to some other metropolitan area or authority. If feasible, triage should be done initially outside the hospitals to alleviate much of the burden on healthcare institutions especially for patients requiring treatment for non-fatal and non- debilitating diseases. The previous CHE challenges—providing triage throughout alterative treatment centers and removing sick people from the affected area as quickly as possible—involved changing the way medical processes have always been commonly performed.[23]

5. VARIABILITY ON THE CRISIS STANDARDS OF CARE

Standardized quality care without variability needs to be emphasized during disasters. To abstain this variability in the standards and quality of healthcare as a response during catastrophic emergencies requires strategy formulation. Standardized strategy design and execution is the part of the role and responsibilities of various state and district health and disaster departments. Hospitals and various healthcare should collaborate with government and nongovernment stakeholders for strategy planning, formulation and execution so that there be uniformity and proper guidelines for all without much of medio-legal concerns. Guidelines for crisis care planning differ significantly between states as well as municipalities. These guidelines also do differ as per various healthcare institutions and hospitals collaborations. This heterogeneity types of decision occurs in strategy formation phases, framework composition, and course of action to address scarce resources, among other things.[21,24] As per IOM ((Institute of Medicine) latest guidelines on disaster emergencies quality of care standards defines the problems and provides country wise framework for standardized care. Publications by IOM, acknowledges states and cultural variations and facilitates uniformity and clarity while addressing key discrepancies in strategy formulation.[23]

6. OUTBREAK OF COMMUNICABLE DISEASES

While natural catastrophes may not necessarily result in widespread epidemics but they do increase the risk of spread of infectious diseases. Improper sanitation services, improper prevention efforts for control of vectors, non-restoration of public health facilities along with rise in population growth and migration contributes to increase risk of epidemics and vector borne diseases.[10]

Although many hospital associations and healthcare collaborations now have strategic planning, facilities, and guidelines in place to improve situational awareness among coalition partners, developing a precise and reliable insight of the bigger extent and progression of catastrophic emergencies across an area, district, province or whole country but capability to implement an adequate and appropriate disaster response, continue to stay as key problem.[25]

7. POPULATION DISPLACEMENT

A large evacuation at healthcare facilities in case of emergencies adds stress as well as needs on healthcare institutions, which include employees, infrastructure, and hospices. Even the hospital infrastructure may be unable to cope with the extra burden due to mass migration during emergencies which could introduce new diseases into the host community. Climatic exposure due to storms or extreme cold conditions puts additional pressure on the healthcare service; a food shortage and nutritious food places the population risk of malnutrition, particularly in children, girls, pregnant ladies, physically disabled, aged people, and chronically ill patients which increases the need for medical assistance.[10]

LESSONS LEARNT FROM PAST HEALTHCARE DISASTERS

Various researches and evidences state that the fundamental threats which ultimately led to healthcare catastrophes, that can be classified as thus:

• Non adherence to the safety parameters or codes of hospital building results into the structural component failure of healthcare institutions. Even inadequacy of resources and manpower, results into the failure of nonstructural component of healthcare system.
• Non-functional and non-workable plan to manage for Catastrophic Healthcare Event
• Ineffective forethought, groundwork arrangements and readiness to deal in disaster emergencies.
• Inadequate and insufficient Intra-Communication within hospital and Inter-Communication between various healthcare institutions and other departments like fire department, police department etc.

As a result, when calamities strike hospitals, the consequences are threefold: health, social, and economic.[11]

ROLE OF HEALTHCARE IN DISASTER PREVENTION

Health emergencies are frequently predictable, and measures for disaster readiness, extenuation, recuperation and convalescence can be put in place. Health emergency planning begins with an impuissant analysis and survey of risk factors that determine the most hazards to a specific healthcare institution and neighborhood. Relationships and connections among healthcare institutions as well as other public engagement groups like as fire regulations, police departments, community health, and municipality administration increase the possibility of an effective synchronized coordinated response during or after a major event.[10]

Disasters necessitate synchronized collaborative response from therapeutic and prophylactic health care services. To reduce the number of death rates, response and relief must be organized as per three levels of prevention initiatives:

1.**First level intervention**

The main objective of first level intervention is primary prevention. Primary intervention aims to reduce disease spread to healthy people by implementing the various measures:

• Boosting health and wellness behavior;

• Implementation of preventive health interventions such as proper supply of safe and clean drinking water which can avert water borne diseases like typhoid, jaundice etc., diseases like malaria prevention with distribution of mosquito nets;

• Prevention of nutritional deficiency disorders especially among pregnant women and children with proper nutritious food supply;

• Proper follow up of Immunization.[10,11]

2.**Second level intervention**

It involves identifying and treating infected persons as quickly as possible to avoid the illness from advancing towards a more fatal condition or demise of an individual. This intervention is accomplished by employing the various techniques:

• Relieving disease progression for example administering ORS to maintain hydration and prevent mortality in children suffering from diarrhea,

• Early diagnosis and treatment of diseases including tuberculosis, dysentery, and others in order to cure patients.[10,11]

3.**Third level intervention**

This level of intervention reduces the long-term effects of sickness, like when a patient receives rehabilitative therapy to relieve the symptoms of stroke or landmine injuries.[10,11]

CONCEPT OF SAFE HOSPITALS IN HEALTHCARE DISASTER PREPAREDNESS

The term "safe hospital," as per PAHO/WHO, is one whose services are instantly accessible and operational with maximum potential and together in the same resources during and post any disastrous or catastrophic event.[26-28] A safe hospital always has good hospital safety index.

Hospital Safety Index (HSI) is a metric that estimates the possibility that a hospital or healthcare institution will remain operational in any disaster situation or emergency. The HSI considers personnel management, functional, structural and nonstructural components, as well as the hospital's environment and health care network. This index is a first measure toward prioritizing hospital emergency readiness efforts. Policymakers would have a general option of a hospital's

capabilities to cope to significant catastrophic events by calculating its safety index, which will further allow overall evaluation of the hospital's preparedness.[26-28]

1. HUMAN RESOURCES PREPAREDNESS

Emergency preparedness of medical and support staffs or disasters is a vulnerability element in terms of human resources. This disaster preparedness includes accessibility and execution of emergency service knowledge/ training of Standard Operation procedure, disaster drills in hospital premises for all healthcare staff and workers along with patients.[29,30]

2.FUNCTIONAL PREPAREDNESS

Hospital supplies availability, transportation, intra and inter-communication are the vulnerability elements of functional readiness. Various indicators of functional preparedness include: (1) hospital facility resources (emergency medical instruments, medicine, emergency medical tents, hospital power generation system, access to clean nutritious food and water, foldable mattresses, triage identification zones); (2) networking (medical emergency communications network as well as other incident command control system); (3) emergency rescue by transport (ambulance availability, helicopter lift rescue).[26-28]

3.STRUCTURAL PREPAREDNESS

The vulnerability aspect of structural preparedness includes infrastructure design in regards to considerations of risk assessment, fire-proofing design, storage requirements, space mapping for emergency evacuation during a catastrophic event like earthquake. Disaster resistant hospitals and capable of withstanding calamity occurrences can provide superior patient medical care.[29]

4. NON- STRUCTURAL PREPAREDNESS

Material management through pharmaceutical resources such as the management of medications, regulation of potentially high-risk drugs etc. is a vulnerability element in terms of nonstructural preparedness. Inadequate internal medicine management readiness in these facilities may result in another hazardous event, for example Fires could be started by the spillage of toxic substance
and buildings could collapse, resulting in additional casualties and disruptions to the delivery of medical care.[30]

For many years, WHO has promoted “Safer Hospitals programs” at the regional, national, and international levels result in policy obligations along with technological support and assistance to administrators in evaluating functional and structural security of amenities and contingency planning throughout catastrophic events.[31]

DISASTER RISK MANAGEMENT

Risk preparedness in disasters have evolved as critical key component to achieve long-term goal along with making the world disaster prepared and resilient place. The approach of risk reduction is a continuous growth and progression process that requires collaboration between communities and individuals.[32,33]

Primary healthcare (PHC) aims at providing essential support to enhance health and wellbeing, which strengthens communities and paves the way for emergency response. PHC-focused policies and practices can help reduce vulnerability and prepare homes, communities, and health systems for catastrophes. Acute care needs and expert interventions are frequently prioritized in the aftermath of a disaster; however, chronic and pre-existing diseases usually bear the brunt of disease burden.[33]

Regional awareness about localized threats is often used to serve the community's genuine concerns, initiatives based on community's concern should be on the foremost in delivering health care services in catastrophes. Precautions at regional level lessen the risk by restricting access to regional hazards. First few hours post catastrophic events are very crucial and many deaths can be prevented, by timely response from the community prior to the arrival of proper medical team for disaster relief. Local communities can be prepared for proper disaster relief measures by proper awareness, which can further reduce the catastrophic risks.[33]

Government hospitals, corporate hospitals and NGO's can collaborate their primary treatment centers, laboratory facilities, dispensaries, diagnostic centers etc. to help the community. Safe hospitals ensure that hospital facilities are built to withstand threats and stay operational in the event of an emergency.[33]

HOSPITAL RESILIENCE

Hospital resilience is a new idea that has been introduced into the framework of hospital crisis management. Disaster-resilient hospital is one that can withstand, respond and reduce the effects of disasters by maintaining its very basic functions like incident command control system, decontamination, emergency surgical and medical care, operational intensive care units, High density units etc. Further it will help hospitals to resume to its full capacity as soon as possible post disaster.[34,35]

The concept of "hospital resilience" serve as a springboard for determining the hospital's functioning to full capacity post disaster and how to evaluate it. The novel concept links key important factors to a measurable goal of enhancing hospital’s pre-disaster robustness and also the speed with which they recover and respond in a crisis. Furthermore, agreement on important indicators serving hospital resilience will increase the uniformity of emergency critical measures

in hospitals post disaster and provide them more capability to deal with all kinds of catastrophic events.[36]

Redundancy, robustness, speed, and resourcefulness are the four characteristics for disaster resilience in a hospital. Through resourceful tactics and redundant resources, resilience of hospitals aims at improving pre-disaster preparedness, along with recovery and response time. The government's role in improving hospital resiliency and readiness is critical. Governments should: (a) proper scaling of catastrophic risk zones for healthcare assessment for disasters, (b) prioritization of disaster preparedness and resilience in risk zones, (c) enforcement of prevention strategies, (d) reassessment of healthcare resilience and hospital preparedness post enforcement of prevention and interventional strategies, (e) establishment of framework securing that hospital is prepared and resilient to cope throughout disasters.[36]

The following are some of the steps involved in creating flexibility and resilience in hospitals include:

• Surge capacity: Hospitals must be prepared to handle huge groups of patients. This may necessitate moving personnel from across the country to assist affected communities.

• Health-care system flexibility: The ability to offer various functions is a critical component of health-care delivery. This may imply cutting back on few facilities in return of boosting other facilities.

• Operational contingency planning for the health sector requires recognizing critical emergency services, methods of synchronized collaborative response, and communication with personnel and collaborative institutions.[37,38]

Efficient planning of healthcare capacity can increase the performance and efficacy of care for patients admitted who have sustained injuries as a result of a disaster. This data can help with making roadmaps for ambulance and patients, management of resources and operations during disaster emergencies.[39]

EMERGENCY PREPAREDNESS COMPETENCIES NEEDS AMONG HOSPITALS AND HEALTHCARE PROFESSIONALS

Well-equipped safe hospitals, efficient hospital staff and clinicians capable of meeting the emergency demands of people during catastrophic event or disaster are required.[40] There are no formal recognized requirements for disaster management training for health care employees, although there are multiple training programmes with various titles and plans to battle calamities.[34] Effective training along with continual and updated education are critical building blocks for disaster preparedness. As a result, regular updated educational training programmes should be designed to improve healthcare providers' knowledge, awareness and skills in treating catastrophe victims. These plans will be created on a national and international scale.[41] A combination of

dialogue, simulation and engagement is more effective in-patient education'; educated healthcare workers and emergency personnel work more effectively and thus are more synchronized during catastrophic events.[41] These core capacities of disaster risk management for health are further illustrated in figure 3.

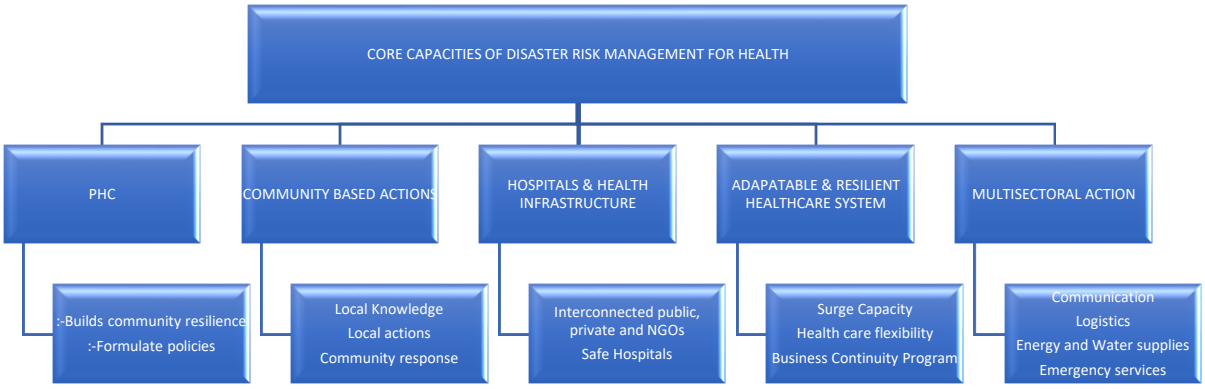

Figure 3: Healthcare Systems core capacities for disaster risk management.

'Emergency preparation,' is a significant component in CHEs, which can be built in hospitals prior to an event and must be equated with a healthcare organization's capabilities. The goals and methodologies of education and worker training for emergency preparedness vary greatly. There are no specified criteria, and there are no recommendations for disaster preparedness training.[42] The first stage in emergency preparedness is determining "who" needs to know "how" to accomplish "what." 'There are no two catastrophes or disasters similar.' However, regardless of the source, the competences required to respond effectively are fundamentally the same in each case. The term 'emergency preparation competencies' refers to emergency readiness and response skills.[43]

Emergency preparedness improves confidence and competency of healthcare professionals and also enhance awareness and skills of rescue actions, regulations and operations. This preparedness on individual level includes enhanced understanding of duties and efficient response. It is yet unclear whether these advancements will last and result in better rescue operations. Foremost mentioned advantages seem to be: revealing shortfalls or time limits in action plan, processes or instructions, and providing a forum for communicating insights gained.[44] Emergency preparedness operations are comprised of a complex activity such as strategy framework, management of supplies and continuous training exercises frequently regarded as the crucial most component.[44-46]

The two primary categories of CHEs preparedness exercises that assess various elements of hospital readiness includes: operation-based exercises and discussion-based exercises. Emergency readiness exercises based on operation includes drills for definite and specific operations training like triage factor, connectivity factor, incident command control system, evacuation etc. on field

scenario that imitate a reaction to a genuine emergency. These exercises focused on operations are harder to conduct out and demand significantly more supplies than exercises based on discussion They do, however, enable for the assessment of equipment, technology, strategies, operations, assets, interdepartmental coordination, and communications systems in scenarios that are extremely similar to those that might occur in a real disaster situation. Emergency readiness exercises based on discussion includes seminars, webinars, conferences or workshops that could be used to familiarize healthcare workers with strategies, duties, and operations to deal the CHE's through active participation in an assisted discussion of modelled disaster events. Facilitators and speakers frequently lead discussion-based exercises to keep attendees on pace in achieving the exercise objectives.[44,47,48]

RECOMMENDATIONS AND WAY FORWARD

Disaster preparedness is a challenging endeavor and critical for hospitals to conduct assessment of risk as well as preparedness evaluations and re-evaluations. The gaps identified through complete evaluation, helps in filling the identified gaps will be a far more manageable process. Volunteers must also be included in hospital emergency management systems. Conversations with locals, disseminating information regarding the initial procedures undertaken pre-disaster, during disaster and post-disaster, and continuous training of healthcare staff prior to a crisis all help to make society more resilient to hazards. Thus, the issue resides between public domain, through safety systems and healthcare systems, it is incumbent on hospitals to take the lead on it. Medical personnel from the area, normally work in disaster prone areas, with limited healthcare facilities, must practice disaster response alongside their hospital counterparts.[29]

Health emergencies that necessitate a big reaction occur seldom; therefore, organizations and staff must practice the processes and abilities to deal with the CHE's. Possibilities include emergency situations threats in a hypothetical major catastrophic disaster, evacuation of hospital, distribution, and practicing reaction etc. Regulatory agencies frequently require or recommend that organizations adopt long-term exercise programmess that are aligned with corporate, regional, national, or supranational interests and contain a variety of exercise forms to achieve certain goals and objectives of disaster preparedness, mitigation and response.[48]

CONCLUSION

Disaster or health emergency research is in its early stages. There hasn't been much researches done and published about hospital preparedness and resilience in India. Further, sophisticated study is needed to assess not just specific abilities like triage and basic healthcare delivery and perhaps more importantly, the transitions that physicians make during CHEs. Effective disaster readiness and response, requires a deep understanding of CHEs and healthcare competencies. Further in-depth knowledge, skills, abilities and awareness are required. As a result, each country must enhance its degree of knowledge in order to recognize and respond to health catastrophes.

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