CHAPTER 1

INTRODUCTION

1.0 What is disaster and disaster management?

1.1 The United Nations (UN) defines a disaster as a serious disruption of the functioning of a community or a society. Disasters involve widespread human, material, economic or environmental impacts, which exceed the ability of the affected community, society, institution or an organisation to cope using its own resources.

1.2 The Red Cross and Red Crescent societies define disaster management as the organisation and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

2.0 **Types of disasters**

We all know that there is no country that is immune from disaster, it is the vulnerability to disaster which varies. We can classify disasters into are four main types namely:

2.1 Natural disasters: These include floods, hurricanes, earthquakes and volcano eruptions that have immediate impacts on humans.

2.2 Environmental Impact: These include technological or industrial accidents, usually involving the production, use or transportation of hazardous material, and it occurs where these materials are produced, used or transported. Also in the list of effects of global warming the forest fires play a major role.

2.3 Civil Emergencies: These involve a break-down of authority, arson, looting and attacks on strategic installations, including conflict situations and war.

2.4 Pandemic Emergencies: These involve a sudden onset of contagious disease that affects health, disrupts services and businesses, brings economic and social costs.

3.0 **Scenario Painting for Hospitals** [1] Hospitals are likely to undergo impairment due to both internal as well as external disasters. While the influence of internal disasters is classically limited to the hospital/ healthcare facility, the external disasters may not physically affect the hospital unless external services like power, water supply etc are affected. Hence we can categorize three scenarios on happening of a disasters. The categories are:

3.0.1 Community is Severely Affected – Hospital not affected at all: Through such scenarios, hospitals play a dynamic role in the disaster response.

3.0.2 Community is not affected – Hospital are severely affected: Such developments occur with the in-house crises/ emergencies of hospitals.

3.0.3 Both the Community and the Hospital are severely affected: Such conditions intensify the challenges posed to hospitals, as the hospitals not only need to cater to the daily routine but also need to face the sudden increase in demand on their facilities because of the surrounding community.

3.1 We have experienced various disasters in India, which have revealed that disasters upset not only the population but also shake the core of health facilities. Take the case of earthquake in Bhuj, thousands of people had died and the health facilities were very severly affected due to the collapse of the civil hospital itself. The devastating fire incident in another hospital in Kolkata, where the fatal causalities were above 90, was a grim reminder that it may not be only the structural pliability but also suppleness in operations of hospitals that needs to be taken care of in order to reduce the effects of disasters on hospitals.

4.0 **Types of Natural hazards: Likely hood of them affecting Delhi & NCR .** A holistic assessment done is as per Annexure B attached.

5.0 **RATIONALE OF STUDY**. Today we are as concerned about disasters, as our economy, since one affects the other and this concern is becoming progressively pertinent due to increases in population, migration of working population, increased construction of infrastructure and terrorist threat which will make it likely that disasters will occur more frequently and with more severity. The economically weaker sections and the under-privileged are worst affected on account of calamities/disasters hence disaster management should occupy an important place in this country's policy framework. Disasters in the communities come in all forms and may influence a small number of people and place concentrated demands on the health system for a short duration while others may although involve a proliferation of casualties though reaching a peak only after a dormant period, thus having persistent and unceasing demands on the health system.

5.1 There is a profound lack of interest, awareness and concern by the Hospital administration for Disaster Management . Following observations are common to many hospital:-

- Presence of operational Hospital Disaster Management lies only on paper.
- Insufficient or widespread absence of communication.
- Deficiency of planning, training and rehearsals to react to disasters.
- Poor plan or non- amenability of construction of structural elements of hospitals, to rules and regulations laid down by civic authorities.
- Lack of networking amongst hospitals.

5.2 For any hospital the part of caring for patient commences with and follows the disaster. The objective is always to prepare the hospital for the growth of emergency response systems, training of staff and acquisition of paraphernalia and materials so that caring for its present patients can continue. The above cited reasons have compelled to study the preparation level of a hospital catering to people belonging to EWS.

6.0 **PROBLEM STATEMENT** : Provision of succor and saving lives in situations when disaster has struck lies with Hospitals and medical staff and they help to mitigate and ameliorate the human suffering. If the hospital is not geared up to take on the casualties quick enough then lesser number of casualties may be saved. Hence following problems plague the health care system:-

6.0.1 Lack of comprehensive, updated and well rehearsed Disaster Management Manual.

6.0.2 Lack of early warning and communication system.

6.0.3 Lack of networking of hospitals.

6.0.4 Lack of Infrastructure and Resources including Human Resource.

6.0.5 Non existence of command and control setup.

CHAPTER 2

AIM

7.0 The aim of this dissertation is to critically analyze the level of preparation of disaster management of ESI Model Hospital, Basaidarapur , by studying its Disaster Management Plan and how it translates on the ground . The standards existing shall be compared with the expected standards as laid down by National Disaster Management Authority and also to suggest a Template of Disaster Management Plan for the hospital.

8.0 **OBJECTIVES**

8.1 **General Objective**- To critically analyze the Disaster Management Plan of ESI Model Hospital.

8.2 **Specific Objectives**-

8.2.1 To carry out Hazard/ Disaster Vulnerability and level of the hospital Preparedness.

8.2.2 To critically appraise the hospital emergency and disaster response and recovery planning

8.2.3 To carry out an appraisal of the awareness level of preparation of DM Plan.

8.2.4 To carry out assessment of resources allocated to DM Plan.

8.2.5 To carry out assessment of safety of structural and non- structural entities.

8.2.6 To evaluate the working of A & E department in handling influx of patients including surge capacity.

8.2.7 To carry out assessment of all critical systems for operational functionality and built in redundancy.

8.2.8 To prepare a hospital specific DM Plan for ESI Model Hospital.

9.0 **The Evaluation objectives formulated were to determine:**

9.0.1 Which all organizational, personnel and operational aspects of the hospital should be considered for emergency and disaster management;

9.0.2 What type of plans and capacities are available to enable the hospital to be ready to respond effectively to major emergencies and disasters, and to manage mass casualties.

10.0 **Methodology:** The study employs both qualitative and quantitative approaches to data gathering .The data collection source for the study is primary, secondary data source and observation.

10.1 Study design: - Descriptive cross-sectional study with secondary data review. Descriptive Study is one in which Information is collected without changing the environment (i.e nothing is manipulated) and Cross sectional study is a study where observation is recorded at point of contact, as in our study observation is recorded at point of contact and without changing the environment hence the study design in Descriptive and Cross sectional. This study is focused on the role and the reaction of the Hospital in natural as well as manmade disaster management. The methodology involves a descriptive type multiple case design study relying on documentation and procedures as the sources of evidence. This study is based on the analysis of primary and secondary data. The main sources of primary data is the check list as given in manual of NDMA and Hospital Safety index by WHO. The source of secondary data is the DM Manual of the hospital, international publication on disaster management, NDMA guidelines, hospital records and Hospital Safety Index by WHO. In addition we used participative observation method to know more on the realistic activities of the hospital related to disaster management plan.

10.2 Study Area:- ESI Model Hospital, Basaidarapur

10.3 Sampling method: Convenient Sampling

10.4 Tools and Techniques**:**

10.4.1 Tool: A written Questionnaire format was taken from manual of Hospital Safety Index by WHO (attached as Annexure C).

10..4.2 Technique: Physical visit to each department and ward along with interview of personals on duty.

10.5 The evaluation carried out is based on the criteria as laid out in Annexure C.

10.6 Analysis of Data: The data so collected was compared with the laid down standards of NDMA and WHO.

11.0 **Assessment Protocols and Techniques**. The Disaster Management Plan of ESI Model Hospital is given in **Annexure A**. **Annexure B** gives out details of a Hospital Specific Disaster Management Plan prepared specifically for ESI Hospital. **Annexure C**

identifies the impact of each Disaster or likelihood of it occurring in Delhi. **Annexure D** gives out the detailed checklist as well as method of interpretation.

Constraints

12. Construction of New Buildings. ESI Model hospital is a tertiary care referral hospital which is presently in a transition phase due to massive construction being undertaken. There are new blocks for wards, Emergency department, Kitchen, pharmacy, Laundry etc under construction. Some departments have partially shifted, while others are fully functional albeit without the completion of some of the support services. Getting to know the future construction plans with respect to it being disaster proof / resilient was very difficult to know.

13. Out Sourcing Services . Most of the ancillary services like security, critical services (electricity, water etc), Ambulance service have been out sourced hence to get to know their response during disaster, their accountability and their command and control would only be ascertained during actual rehearsal. Until such a drill is carried out every individual who was in charge assured full compliance without any set SOP.

CHAPTER 3

Review of Literature

14.0 National study:-

14.1 HOSPITAL'S PREPAREDNESS FOR DISASTER: INDORE CITY HOSPITALS [22]

14.1.1 The purpose of the study has been to assess how well the Indore Hospitals are prepared for managing the disaster. Therefore, the study has been planned on the basis of Survey research design where in the research shall lead to the conclusion whether the Indore hospitals are adequately prepared to face any kind of eventuality involving a large number of casualties and injuries requiring immediate care. A number of hospitals were selected for the study based on their size, existing working status & locality. The representative plan for the selection of hospitals was as follows: At the outset, the hospitals were clustered on the basis of the number of beds available to patients for treatment as an indoor patient viz Hospitals having more than 100 beds and second group of hospitals having size less than 100 beds.

14.1.2 Secondly, the hospitals with less than 100 beds capacity were further selected on basis of their location so as to represent almost all the areas of the city i.e. the four areas (demarcated as north south east & west) of the city.

14.1.3 Out of twelve Hospitals surveyed only four hospital have some system for disaster management plan however only one hospital in public sector was found to have adequate infrastructure for management of disaster. No hospital wants to learn from others mistake and even when the past mistakes are known little effort is put to rectify them.

14.1.4 Among all the hospitals surveyed only four Hospitals i.e three from Private Sector and only one from Public Sector have developed or are in the process of developing some infrastructure to meet with the disaster situation, this too in routine manner. With 10% of the hospitals having such disaster planning committees, which review time to time the hospitals' effectiveness in dealing with the eventualities. Despite the fact that 20% of the hospitals have adequate space for treating mass causalities only 10% hospitals have disaster preparedness. All hospitals cater to providing medicines from their own pharmacy to the patients

hence they would have sufficient inventory which can be utilized for Emergency purposes. This facility of reserve stock was available in upto 30% of hospitals.

14.2. **Disaster Plan for SMS Hospital**[23] (Department of Hospital Administration, SMS): - Initially they made a disaster committee and decided committee members. According to the study Disaster management involves a host of multi discipline agencies of which medical relief is one of the most important one. There can be no tailor made disaster plan for the hospitals. Each hospital has to evolve its own plan based on the aforementioned considerations, and it has to be revised from time to time as each experience will bring new perspectives. Finally, it must be understood that a disaster can occur anywhere and at any time. It is no respecter of circumstances. It strikes with suddenness and fury and has a curious tendency of choosing the most inappropriate moment. To deal with such sudden influx of a large number of casualties, quantitative extension of hospital has to be pre-planned.

According to study Disaster is an emergency situation. Timely help of every individual is needed to make this plan a success to reduce the Mortality and Morbidity. In such state of affairs the individual and personnel consideration take low priority in the face of duty to the profession for sake of amelioration of human suffering.

15.0 **International study**

15.1 **Disaster Planning: St. Boniface General Hospital** (24):-

15.1.1 The St. Boniface General Hospital of City of Winnipeg, was mandated to take significant steps to protect patients, staff, and its physical assets, by way of evacuating the hospital and transfer to alternative sites in the city as it was located on the river bank of Red River. This being a huge 600-bed tertiary-care Medical College with specialized care including dialysis, invasive cardiology, medical intensive care, neurosurgery, cardiac surgery, neonatal intensive care, surgical intensive care and the second largest hospital in the Province. It also a large Research Centre with millions of dollars in specialized equipment and laboratories.

15.1.2 A Flood Contingency Committee had been formed by the Hospital in order to plan and coordinate for the anticipated flooding, and initially it was thought to be an essentially localized event. The grim picture started to emerge of flooding and devastation in upper river region area when it was obvious that this disaster was taking on a considerable extensive range. Pictures of the devastation in Grand Forks made people realize that they were facing a destruction never seen before.

The Hospital Contingency Committee got down to fight the internal disaster situation, however it was one part of the healthcare-system which included the local, district level , and national level disaster coordination.

15.2 **Hospital Disaster Preparedness in the United States: New issues, New Challenges** [25]-

15.2.1 Disasters are always treated as an event which is of low probability yet when they hit they have a high impact. Any definition of disaster is probably institution specific, and hence preparations also must be likewise. A single same event may be a disaster for a 30 bedded hospital while may be a little more than routine work for a 1000 bed hospital.

15.2.2 The term "hospital preparedness" is a wide-ranging phrase, it not only covers a swarm of interlinked areas of medical, administrative and social sectors for preparations of disaster. There are various accreditation agencies who mandate specific standards for hospital preparedness like the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), however many hospital have these standards only as a document. Prior to 9/11 the hospital preparedness was either focused on natural or unpremeditated man-made disaster, however after the 9/11 mass casualty event the health care system of US woke up to the reality that a terrorist threat was more unpredictable and probably more devastating. The need to prepare for such events was required to be taken on war footing.

CHAPTER 4

Brief History of Organization: Employees' State Insurance Corporation (ESIC)

16.0 **Employees' State Insurance** (ESI)[16,18] is a self-financing social security and health insurance scheme for Indian workers. This fund is managed by the Employees' State Insurance Corporation (ESIC) according to rules and regulations stipulated there in the ESI Act 1948. ESIC is an autonomous corporation by a statutory creation under Ministry of Labour and Employment, Government of India.

16.1 The ESI Act 1948, caters for assured health related issues which the workers are generally exposed to. These eventualities like sickness, disablement which lead to their loss of earnings and livelihood are covered here.

16.2 **APPLICABILITY[20] :-** Under Section 2(12) the Act is applicable to non-seasonal factories employing 10 or more persons. Under Section 1(5) of the Act, the Scheme has been extended to shops, hotels, restaurants, cinemas including preview theatres, road-motor transport undertakings and newspaper establishments employing 10* or more persons. Further under section 1(5) of the Act, the Scheme has been extended to Private Medical and Educational institutions employing 10* or more persons in Certain States/UTs.

*Note: The existing wage limit for coverage under the Act is Rs.21,000/- per month (w.e.f. 01/01/2017).

16.3 **Administration[16]** :- This unique social security platform is managed by an apex corporate body called the **Employees' State Insurance Corporation**. The Corporation, with its Central Headquarters at New Delhi, operates through a network of 63 Regional and Sub- Regional offices located in various States. The administration of Medical Benefit is taken care of by the respective State Governments except in case of Delhi and Noida/Greater Noida area in Uttar Pradesh where the Corporation administers medical facilities directly.

16.4 **Finance[16]** :- ESI Scheme, like most of the Social Security Schemes the world over, is a self financing health insurance scheme. Contributions are raised from covered employees and their employers as a fixed percentage of wages. The State Governments,

subsidize 1/8th of the spending of medical benefit within per head top limit of Rs. 1500/- per Insured Person per annum..

16.5 **Contribution** [16]:- E.S.I. Scheme is contributory in nature which means that all of the employees in the industry to which the Act applies have to be insured. The contribution are specified at specific rates which are revised [7] regularly. Presently, the employee will contribute 1.75% of his wage and the employer will spend 4.75% of the wages paid/payable to that particular employees.

17.0 ESIC Hospitals in Delhi [18,19]: The Corporation presently administers 36 ESI Hospitals in various States and is striving to develop them as ESIC Model Hospitals. The hospitals in Delhi are located in :-

- Basaidarapur (designated as Model Hospital)
- Jilmil
- Noida
- Okhla
- Rohini

17.0 **Profile of ESI Model Hospital Basaidarapur**.[21]

17.1 ESI Model Hospital was commissioned on 1st December 1971 with a bed strength of 150 and presently it has indoor bed strength of 600. Now it even serves as a referral center for other ESI hospitals of Delhi and NCR.

17.2 **Objectives and Goals of ESI Hospital Basaidararpur [21]:** The main objective of Hospital Emergency/Disaster plan of this hospital is to optimally prepare the staff and institutional resources of the hospital for effective performance in different disaster situations. The Hospital disaster plans would address not only the mass casualties which may result from MCI that has occurred away from the hospital but would also address the situation where the hospital itself has been affected by a disaster –fire, explosion, flooding and earthquake.

17.3 **Accreditation & Quality** :- It is an ISO9001-2008(OQS) certified and rated as "H-2" Category by ICRA.

17.4 **Management** :- The hospital is administered by an experienced team headed by Medical Superintendent (MS) . To assist MS there are two Addl. Medical

Superintendents posted to look after day to day routine work of the hospital. The MS is also assisted by a Jt. Director, a Nursing Suptd. , three Dy. Directors one each for Cash, Finance and for admin . The concerned Head of Deptts are looking after the functioning of each specialty.

17.5 **Infrastructure & Facility** :- Departments are well equipped with ambulance equipment for critical care management, resuscitation devices, round the clock CMOs and doctors of all major specialties are available. There are nine well equipped OTs and emergency operations are performed round the clock. Institution has ICU(6 beds), NICU, ICCU (6 beds),well equipped Labour room, Blood Blank, Radiology & Imaging, Pathology, Biochemistry, Microbiology, Laundry, CSSD, Kitchen and heavy duty generators. A/E department has 45 beds with capacity of additional 10 beds in the event of disaster. As per the directive of the Delhi Govt. a provision of additional 60 disaster beds are under process currently at this hospital.

17.6 In the pursuit of carrying out the preparedness for disaster the gap analysis of ESI hospital located at Basaidarapur has been undertaken. The key to any disaster preparedness is to ensure that the functionality is not affected and the health care can continue to be provided during and immediately after an emergency.

CHAPTER 5

Findings

18.0 A Hospitals is an important unit for the management of mass casualty. All the preparations carried out in the pre-disaster phase enhances the effectiveness of their coordinated response during disasters. The availability and quality of medical facilities also differ drastically from urban to rural and from private to governmental hospitals. ESI Model hospital in India is under different administrative setups being under Labour Ministry and not under Ministry of Health and Family Welfare.

18.1 Awareness of Drills, Protocols and Resources. The level of awareness of the protocols for the following was found to be non-existent/ very low:-

18.1.1 Evacuation in case of disaster/ emergency of wards / hospital.

18.1.2 Treatment and discharge of patients already admitted.

18.1.3 Deployment of resources like ambulance, paramedical staff, extra beds, stretchers etc.

18.1.4 Contact details of important appointments by way of directories.

18.1.5 Job cards, responsibilities and accountability.

19.0 **Administration.**

19.1 The HIRS has neither been formulated logically nor has it been updated.

19.2 The DMP manual is theoretical in nature and has not been revised/ updated since last three years.

19.3 Last practice was carried out in September 2017 which was a non starter since no ambulance ever reached.

19.4 No Warning System is existing . No 'Hooters' were found to be functional in the hospital.

19.5 For internal warning and announcements, no PA system has been installed.

19.6 Command and Control Authority. The Hierarchal Tree giving the position, responsibility and accountability is not given out/ is outdated.

19.7 Define the Sequence of Action. Actions required to be taken from issue of warning to post disaster consolidation have not been given in any department/ ward.

19.8 Resource allocation and management. Miniscule resources have been found in the form of folding beds, stretchers and wheel chairs. No allocation for disaster has been done in either Blood Bank nor Medical stores.

19.9 Information and Communication . Communications can be termed to be one of the main area of concern in major emergency and disaster. No Media Cell / Public Information Cell has been set up in the Hospital premises. The following means of communications and connected paraphernalia required were found deficient :-

19.9.1 External stake holder's directory.

19.9.2 Internal telephone exchange was found to be old and analogous.

19.9.3 MTNL Landline connections were insufficient.

19.9.4 No separate emergency numbers dedicated.

19.9.5 No backup in form of a private mobile/cellular phones in closed user group (CUG) for hospital staffs, is provided.

19.9.6 Wireless sets for ambulance personnel has not been catered for.

19.9.7 Dedicated Land line numbers for the communications room as it has to be in uninterrupted contact with the command center/control room.

20.0 **Security and safety.** Presently the security of the hospital has been out sourced to a private firm which does not have any information of keeping a record of carrying out any exercise for identification of any areas where increased vulnerability is anticipated or for that matter identified Vulnerable Area (VA) or Vulnerable Points (VP).

21.0 Human Resource. No HR management policy for disaster situations has been laid down and the hospital does not have the following :-

21.1 The staff contact list with mobile telephone numbers.

21.2 The emergency staff contact list was not found to be displayed in Disaster box/ Almirah or at any nursing station.

21.3 No staff detailment has been made for critical areas.

21.4 No plan exists to employ and train additional staff according to the foreseen need.

21.5 No tying up with the local community to assist hospital services during emergencies with volunteer groups and NGOs.

22.0 **Logistics, Supply and Financial Management**. Following were found deficient:-

22.1 Safety stock for disaster/ emergency. Dedicated place for emergency stores.

22.2 No MOU with the vendor or local supplier was found only an understanding between them exists.

22.3 No separate head for disaster in main budget for quick mobilization of funds.

22.4 No availability of petty cash/dedicated contingency fund for disaster management.

22.5 No dedicated Ambulance held as the services have been out-sourced, this does not guarantee timely and adequate number of both ALS and BLS ambulances.

23.0 **Patient Care and Support Service**. The essential services of the Hospital have to continue in all the conditions, however following were found wanting:-

23.1 The evacuation plan is not displayed in any ward of Hospital.

23.2 Coordination and network with nearby hospitals/health care institutions was found non existent.

23.3 No contingency mechanisms for hospital waste management, since the waste management is also out-sourced hence needs redundancy or alternate resources.

24.0 **Triage**. Following was found:-

24.1 No contingency site for receipt and triage of mass-casualty victims and an alternate waiting area for wounded patients who are able to walk have been formalised.

24.2 No orders on protocols of hospital admission, referral, discharge and admission to OT during the disaster to simplify patient flow.

25.0 **Activating of Surge Capacity**.

25.1 The sites have not been designated in different zones as per protocol and in the Disaster Management Manual, No signage's and colour coding done.

25.2 The space earmarked for emergency beds do not have adequate space at the time of need may not be available.

25.3 Necessary manpower has not been earmarked as to how many Nursing orderlies and Nurses will be diverted from other wards etc.

25.4 No designated area is specified that can be used as a provisional morgue, the existing morgue is a little distance away. No known contingency plan exists for warranting post mortem procedures.

26.0 **Physical Layout** The hospital is spread out over 32 acres with different wards and blocks being quite a distance apart. Following was found :-

26.1 Haphazard two wheeler parking especially near A & E deptt. No ambulance or a fire truck can even approach the new blocks.

26.2 All the wards and deptts in the new block have single entrance and exit. No ramps exist for evacuating patients by trolleys,

26.3 More than half the lifts are non functional.

26.4 New blocks do not have central Air Conditioning functioning.

26.5 The false ceiling in wards and corridors need to be tested for fire resistance.

26.6 There is only one kitchen catering to dietary requirements of the entire hospital, alternate site or secondary kitchen has not been catered for.

26.7 No fire suppressive system was found installed/ functional.

26.8 All Labs are spread out and for A & E no separate mini lab with portable machines like ECG, USG etc are catered for. The technology of Vacuum tubes for carriage of sample and reports has not been installed.

CHAPTER 6

Critical Appraisal of Hospital DM Manual/Plan

27.0 The disaster manual of ESI Model Hospital (attached as Annexure A) has been made with the aim of Laying down policies and protocols for Disaster Management. It has been updated on 01 January 2015.It goes to elaborate the bed strength , number of specialties to number of OTs etc. The institutional framework on which the manual has been made is acknowledged and 'The Aim and Objectives' have been clearly spelt out. A worthy attempt has been made to layout the responsibilities, situations and contingencies which the hospital may face.

28.0 The Good Points.

28.1 The Manual spells out both Disaster Policy Committee as well as Disaster Management Committee.

28.2 The preparations for disaster has been rightly divided into pre, during and post disaster scenario.

28.3 It has been mandated that the committee should meet every month to finalise the preparation level, stores and infrastructure required the responsibilities required to be assigned.

28.4 Various appointments have been made in-charge for various activities like planning, logistics etc.

28.5 Various space and areas have been earmarked to act as disaster wards, increase surge capacity and triage area.

28.6 Various symptoms have been laid down in the manual to assist the triage officer in categorizing patients.

28.7 The Manual gives out a flow chart in the form of Triage Sieve for easier comprehension.

28.8 Quick Response Teams (QRT) are mentioned to be detailed and dispatched according to situation.

28.9 Various ancillaries like Ambulance and Mortuary services have been defined for their responsibilities.

28.10 For activation of disaster plan the action has rightly been divided into no of patients less than or greater than 30.

28.11 Command Center and Visitors Control Center have been earmarked.

General responsibilities of various responsibilities have been laid down.

28.12 In various annexures the contents of medicine box etc have been given out.

30.0 Area Requiring Improvements

A Hospitals is an important unit for the management of mass casualty. All the preparations carried out in the pre-disaster phase enhances the effectiveness of their coordinated response during disasters. The availability and quality of medical facilities also differ drastically from urban to rural and from private to governmental hospitals. ESI Model hospital in India is under different administrative setups being under Labour Ministry and not under Ministry of Health and Family Welfare.

ESI Model hospital while formulating its policy and writing its Disaster Management Manual did not consider the following:

30.1 A number of disasters that can affect the city, may it be natural or man made could have been considered.

30.2 The Manual has laid down various procedures with only one situation considered, an external disaster, which has not affected the hospital. Refer para 3 of chapter 1 and Annexure B in which various other contingencies have been laid out.

30.3 The hospital is under going a large scale relocation due to construction of new buildings, the manual should have been revised and contingencies worked out for any mishap during construction of shifting/ relocation.

30.4 Two committees of Disaster Planning and Disaster Management have been constituted having the same members who have never met for any discussion on preparation or planning. There is no record of the monthly meeting as mandated in the manual.

30.5 No mention has been made as to how an alarm is to be sounded and which code is to be issued for internal disaster or external disaster.

30.6 The lines of authority are ambiguous and some appointments are vague leaving a doubt.

30.7 A copy of Disaster Manual is neither available in the Emergency Ward nor in the Disaster cupboard/ Box.

30.8 No holistic assessment for infrastructure or store has been done and nor has it been labelled exclusively for disaster management. No planning or procurement been done exclusively for disaster scenario.

30.9 No order has been published to appoint a **Sister in Charge Disaster** or a Nodal Officer by name or his successor in his absence.

30.10 The Keys of Disaster Cupboard are not kept in a designated place and no protocol exists for duplicate keys to be at another designated place or with person.

30.11 No directory of contact person is displayed in disaster box/ almirah. The emergency department also does not have the directory.

30.12 Although various department heads have been made in-charge responsible for triage area however there is no substitute in case of his absence and neither does any documentation maintained separately, especially the MLC cases.

30.13 Identification of indoor ward for disaster has been earmarked earlier but new buildings have since been constructed, hence needs to be changed.

30.14 While perfunctory mention has been made of responsibilities of each appointment, however no Job Cards have been prepared. The Job Cards are also not available with Emergency Department, thus making a new person or a person unfamiliar with the situation functioning very difficult.

30.15 The QRTs have been mentioned as an academic point with no detailment of personnel. Unless people are detailed by name on daily/weekly/fortnightly basis, the QRT can never mobilize. No transport or ambulances have been earmarked.

30.16 For maintaining patient records a separate register is required to be maintained and this was not found to be the case here.

30.17 Ambulance vehicles if not under command will never be available when needed as has been proven by last rehearsal where no ambulance reached the hospital when called for and the rehearsal for Disaster Management had to be called off.

30.18 After activation of the Disaster Plan the Command Centre cannot be the located in emergency area which is also the site of Triage. The Command Centre should be sufficiently detached yet in the near proximity.

30.19 Communications have not been given the attention that it deserves, for all operations will fail if the communications are faulty.

30.20 Management of security is a major task during such emergencies and the same has not been done justice to. The SOP for security could be made as an annexure to the main document.

CHAPTER 7

31.0 **Suggestions And Recommendations**

31.1 To ensure that the hospitals meet the requirements of being called as safe, every action, procedure, process, the building's location, its design specifications as well as the materials used, do contribute . Critical services for instance the , water supply, electricity, waste management including disposal of Bio-medical wastes as well as hygiene and sanitation are important to ensure stability of processes during a situation of crisis. A single template for all hospitals cannot be made as each hospital is exposed to different kinds of hazards. The hospital committee could however use this information as given in Annexure B to carry out its self evaluation in respect of the present-day and future hazards for which the hospital should be prepared to respond. Once the assets are listed out it is easier to work out the shortcomings.

31.2 The National Disaster Management Guidelines on Hospital Safety have been framed by NDMA[(1)], in discussion with various participants, academic professionals from across the spectrum of society as well as officials from concerned Governmental Ministries and Departments. These guidelines have been kept in mind while developing "Hospital Specific DM Plan" and carrying out the assessment.

31.3 NABH Accreditation Standards addresses all the requirements related to hospital safety, risk management, disaster planning, monitoring and evaluation under various chapters. These standards[(1)] provide a framework for quality assurance and quality improvement and focus on patient safety, employee safety, community and environment safety and quality of patient care. NABH Accreditation Standards for Hospitals 3rd Edition in a Nutshell contains 636 Objective Elements under 102 Standards. These standards too are not binding on the hospital unless it applies for NABH accreditation.

31.4 Enhancing Awareness. Primary step required to be taken towards enabling the hospital safety is to increase the responsiveness among various participants regarding the necessity to have safe hospitals. The aim being to provide the basic data and creating the facilitating environment so that the level of approval for hospital safety is increased. The mindfulness of the necessity for hospital safety is applicable for the top management as it is for the lowest working hand of the hospital.

31.5 Management and Administration. To endow operational vigilance and suitable reaction during disasters, an professionally functioning HIRS has to be established. The

HIRS of ESI Model Hospital is existing in the form of "Hospital Disaster Management Plan" but more of it exists on paper, is theoretical in nature and has not been revised/ updated since last three years. It has to be entrenched into rehearsal, updated/revised and tested through repeated exercises & drills. The following actions need to incorporated urgently:-

31.5.1 Robust Warning System. In order to give warning outside the hospital building the hospital is required to install a number of 'Hooters' to ensure adequate coverage all around . For internal warning a PA system is straightaway required.

31.5.2 Clear-cut Command Authority. The Hierarchal Tree giving the position, responsibility and accountability is required to be spelt out with respective job cards for each person. The job cards are also required to be kept with Sister in charge of Emergency Department as the rally point during disaster would invariably be the A & E Deptt.

31.5.3 Define the Sequence of Action. Actions required to be taken from issue of warning to post disaster consolidation have to be laid out.

31.5.4 Resource allocation and management. All resources required for any disaster should preferably be kept segregated and their location, authority for usage etc known to all stake holders. Each department should cater for at least 10%-15% of its resources reserved for disaster, especially the Blood Bank should cater for at least 10% of each blood type for emergency/disaster.

31.5.5 Training and rehearsals . All of hospital staff including HIRS members are required to be trained on the arrangement and tasks of the HIRS system. This could be part of induction training for a week for all new appointments, or organized as "Disaster Management Week" once every six months for everyone, with no exception, in the hospital. Regular practices to check the reaction proficiencies to emergencies in real time will serve as prospects for practical learning for the hospital staff. Hospital Disaster Management Plan therefore has to be regularly updated and revised to meet the changing and emerging scenarios, in the case of ESI Model Hospital the revision took place three years ago.

31.5.6 Information and Communication . Communications is one of the main problems in major emergencies and disasters. Information transfer has to be reduced

to most important facts only. Multiple means of communications should be planned (build in redundancy) to communicate with hospital staffs and administrator. A Media Cell / Public Information Services has to be set up in the Hospital premises from where all the information can be disseminated, protocols need to be laid down for the kind and amount of information is required to be disseminated. The Media Cell has to connect with the District authorities & other key stakeholders like Police, Fire Services, NDMA and other networked Hospital who are managing patients in the same general area. The following means of communications must be synergized to reduce confusion and expedite execution of action:-

- ✶ External stake holder's directory to be prepared and placed prominently.
- ✶ Improve Internal telephone exchange (the hospital needs to upgrade it)
- ✶ Landline phones, dedicated numbers for disaster to be promulgated .
- ✶ Mobile/cellular phones in closed user group (CUG) for hospital staffs be provided.
- ✶ Loudhailers and public address system are required to be installed.
- ✶ Wireless sets for security and ambulance personnel.
- ✶ Dedicated Land line numbers for the communications room as it has to carry out constant interaction with the command centre/control room.

32.0 Security and safety . A safety officer should be nominated from within the organization as he has a big responsibility not only during crises but also during day to day operations. The security needs to :-

32.1 Work out mechanism to guide additional medical personnel who have come to help during disaster relief to the patient care areas when needed.

32.2 Establish standard procedures required for safe and efficient hospital evacuation.

32.3 Seek the protocol for crowd control from Police and Hospital Administration. Define the threshold and conventions for involving local law enforcement.

32.4 Take inputs regarding constraints ,challenges and control measures in prevention and controlling of hospital associated infection.

32.5 Ensure that all confidential information is securely collected, stored and reported to only 'need to know basis'.

33.0 Human Resource. The Hospital needs to institute and implement a HR management policy for emergency like disaster situations by not only looking after their own staff by identifying minimum needs in terms of number of health-care workers but also ensure the working competence of the hospital/department in emergencies. The Hospital may undertake the following actions:-

33.1 Prepare and disseminate the staff contact list with mobile telephone numbers Whatsapp numbers etc. This list should be revised every quarter and made available to not only A & E deptt but also to Command Centre, Administrative Heads and Disaster box/ Almirah. This list can also be displayed prominently at all nursing stations.

33.2 Prioritize staffing requirements in critical areas and their deployment.

33.3 Specific duties need to be assigned to each appointment on duty.

33.4 Need to employ and train additional staff according to the foreseen need.

33.5 The Hospital needs to ensure suitable number and the competency of staff in providing high demand clinical response services during emergencies by providing refresher training.

33.6 Lay down protocols for number of shifts, rotation and self-care of clinical staff to support them while they have to put in long hours.

33.7 Mobilize satisfactory support of the local community to assist hospital services during emergencies by tying up with volunteer groups and NGOs.

33.8 Adequate measures to be ensured for dealing with psychosocial and psychological issues of hospital staff and their families. The Hospital should assistance of the Social workers.

33.9 Lay down Standard Operating Procedures (SOP) as an organizational apparatus for issuing authorization and speedy induction of all ad-hoc / contractual medical personnel who are not on the regular rolls to work in the hospital for enabling capacity surges.

33.10 All security personals to be trained in administering at least first aid and CPR.

34.0 Logistics, Supply and Finance Management. For proficient logistics, supply and fiscal management the hospital needs to improve upon the following:-

34.1 Prepare a catalog of all equipment, stores, supplies and medicines and regularly update them to avoid any deficiency alert.

34.2 Formalize safety stock for disaster/ emergency. Place the same segregated in respective storage area, alternatively increase stocking of clinical store in A & E deptt. Non clinical and non perishable stores like folding beds, linen, stretchers, wheel chairs etc be kept in a storage within easy reach of A & E deptt. This store should be opened, cleaned and equipment maintained regularly under the supervision of administrator head of A & E deptt.

34.3 Propose and formalize with administration mechanism of safeguarding the uninterrupted delivery of essential medicines and supplies in the event of an emergency by entering into an MOU with the vendor or local supplier and ensure an continuous cold chain.

34.4 Establish processes for quick assessment of the status of functionality of different equipment and ensure that ready maintenance and repair of those equipment required for essential services is carried out without delay..

34.5 Prepare a separate head for disaster in main budget for quick mobilization of funds for response rather than moving files for approval.

34.6 Finance deptt should guarantee availability of petty cash/dedicated contingency fund for disaster management.

34.7 Since the Ambulance services are out-sourced, ensure adequate number of both ALS and BLS ambulances are available. Beef up the numbers during warning period. Communication with the driver and his location to be fixed and the vendor to be held accountable with suitable penal deduction in case of failure to adhere.

35.0 Patient Care and Support Service. The essential services of the Hospital have to continue in all the conditions by:-

35.1 Safeguarding and making available suitable resources and hospital provisions, also develop and ensure redundancy plan of utility services are done.

35.2 Hospital evacuation plan should be made, practiced and prominently displayed in each ward and floor next to the entrance.

35.3 The Hospital needs to coordinate and network with nearby hospitals and institutions that can support in enduring the crucial services of the hospitals during the emergencies. The hospital can list out, categorize all hospital facilities their functioning, and rank them in order of priority. Presently no protocols or formal document exists.

35.4 Ensure contingency mechanisms for hospital waste management, here the waste management is also out-sourced which needs redundancy or alternate resources.

35.5 Triage. To undertake effective triage the Hospital needs to:-

35.5.1 Elect an skilled triage officer to administer all triage operations.

35.5.2 Identify a contingency site for receipt and triage of mass-casualty victims and an alternate waiting area for wounded patients who are able to walk.

35.5.3 Publish order on protocols of hospital admission, referral, discharge and admission to OT when the disaster plan is activated to simplify patient flow.

36.0 Activating Surge Capacity. Surge capacity is defined as the capability of the hospital to increase its capabilities beyond normal capacity to meet increased demand for medical care of patients particularly during disaster event.

36.1 The sites have been identified that could be converted into additional patient care units next to emergency deptt, however not designated in different zones as per protocol and in the Disaster Management Manual, hence necessary signage's and colour coding is required to be done.

36.2 The space earmarked for emergency beds have been suitably marked but have been re-appropriated and at the time of need will not be available.

36.3 Necessary manpower has to be earmarked as how many Nursing orderlies and Nurses will be diverted from other wards etc.

36.4 No designated area is specified that can be converted into a temporary morgue and no known prospective plan exists for warranting post mortem procedures.

36.5 Following need to be earmarked :-

36.5.1 Manpower for surge capacity protocol.

36.5.2 Stores and equipment.

36.5.3 Procedure for discharge/transfer of patients already admitted.

36.5.4 The blood bank should cater to 10% of blood groups to start with.

36.5.5 Dietary services for patients, relatives of patients and own staff.

37.0 Patient Handling. To avoid alarm, confusion, unsystematic evacuation, preventable injuries and loss of lives, hospital should prepare patients and their attendants on the relevant aspects of the DMP during warning period. A set evacuation plan or emergency exit methods should be followed during disasters through conspicuous display of **exit and evacuation route maps** at strategic locations all over the hospital premise. In and around the hospital hazards and risks have to be prominently displayed through hoardings, wall hangings and posters. The posters should be long-lasting and exhibited permanently at all times in the hospital premises.

CHAPTER 8

Conclusion

38.0 Due to its unique geo-climatic conditions India has been traditionally vulnerable to natural disasters. Floods, droughts, cyclones, earthquakes and landslides have been a recurrent phenomena. Most of the hospitals in India are situated in hazard-prone areas and hence by virtue of their location itself the structural and nonstructural safety of the hospital is subject to debate.

39.0 It is recommended that all hospitals should have a programme structured for emergency and disaster risk management that addresses risk assessment, hazard and vulnerability reduction, response and recovery, and the focuses on the readiness of the hospital to respond to emergencies and disasters.

CHAPTER 9

References

1. *National Disaster Management Guidelines: Hospital Safety. A publication of the National Disaster Management Authority, Government of India. ISBN: 978-93-84792-03-9*
2. *Principles of disaster mitigation in health facilities. Washington (DC): Pan American Health Organization; 2000.*
3. *Guidelines on non-structural safety in health facilities. Kathmandu: Ministry of Health of Nepal/World Health Organization; 2004.*
4. *Guidelines for seismic vulnerability assessment of hospitals. Kathmandu: National Society for Earthquake Technology – Nepal (NSET)/World Health Organization; 2004.*
5. *Non-structural vulnerability assessment of hospitals in Nepal. Kathmandu: National Society for Earthquake Technology − Nepal (NSET)/Ministry of Health of Nepal/World Health Organization; 2003.*
6. *Mitigating earthquake risk in health facilities: a structural vulnerability assessment of hospitals in Kathmandu Valley. Kathmandu: Ministry of Health of Nepal/National Society for Earthquake Technology − Nepal (NSET)/World Health Organization; 2002.*
7. *Curso para Evaluadores del Programa Hospital Seguro. México City: Instituto Mexicano del Seguro Social/Secretaría de Gobernación de México/Pan American Health Organization; 2007.*
8. *Gibbs T. Design manual for health services facilities in the Caribbean with particular reference to natural hazards and other low-frequency events. Bridgetown (Barbados): Pan American Health Organization; 2003.*
9. *Environmental health in emergencies and disasters: a practical guide. Geneva: World Health Organization; 2002.*
10. *Principles of disaster mitigation in health facilities. Geneva: World Health Organization; 2007.*
11. *Outbreak communication planning guide. Geneva: World Health Organization; 2008.*
12. *Safe hospitals in emergencies and disasters: structural, non-structural and functional indicators. Geneva: World Health Organization; 2010.*
13. *Hospital emergency response checklist. Geneva: World Health Organization; 2011.*

14. *www.who.int*
15. *www.paho.org*
16. B*ibleHR.com. What is ESIC?: ESIC FAQ.*
17. *"Employee State Insurance: For a handful of contribution, a bagful of benefits24 February 2011" (PDF).*
18. *"ESI plans 11 medical colleges". The Hindu. Chennai, India. 28 October 2009.*
19. http://pib.nic.in/newsite/PrintRelease.aspx?relid=113364
20. *"ESI Wage Limit Raised".*
21. *www.esih-basai.org*
22. www.adpc.net/audmp/rllw/themes/gen-in.pdf
23. http://www.searo.who.int/LinkFiles/Hospitals_Safe_from_Disasters_Document20.pdf
24. http://www.ncbi.nlm.nih.gov/pubmed/10345289
25. The internet journal of rescue and disaster medicine ISSN 1531-2992