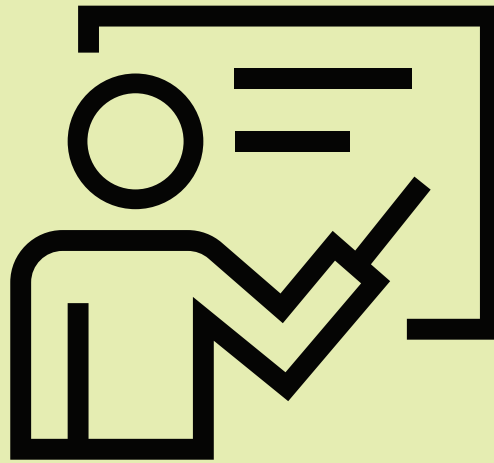*Modules for Training Hospital Stakeholders on Hospital Safety*

TECHNICAL NOTES

TRAINERS' NOTES

March 2023

Indian Institute of Management
Ahmedabad

National Disaster Management Authority
Government of India

Modules for

Training Hospital Stakeholders

on

Hospital Safety:

Trainers' Notes

Preface

Since its inception in 2005, the National Disaster Management Authority (NDMA) has undertaken numerous initiatives for Disaster Risk Reduction and capacity building for disaster management in conformity with its mandate under the Disaster Management Act, 2005. This Hospital Disaster Management (HDM) Manual is an initiative in that direction. The manual focuses on important and critical areas of Hospital Safety during disasters. It contains training modules on Hospital Safety that have been developed in line with the 2016 NDMA guidelines.

The contents of this manual have been prepared keeping in mind all the stakeholders in a hospital setting across multiple levels, including the Leaders, Assessors, Doctors and Front line Staff (nurses, paramedics, ward boys, security staff and ambulance staff). It seeks to empower these stakeholders to address Hospital Safety through a multi-hazard and interdisciplinary approach. While the structural safety of hospitals has been emphasized in recent building guidelines, these modules aim to strengthen the capacity of stakeholders in every hospital in the country to develop a fully functional and regularly tested Hospital Disaster Management Plan (HDMP). The manual has been reviewed by several experts and will serve as a handy document for all training programmes on Hospital Safety.

We take this opportunity to express our heartfelt appreciation to the team of experts from IIM Ahmedabad and various stakeholders who extended their willing support, cooperation and commitment by devoting their expertise to make valuable contributions to the development of this document. We are optimistic that this effort will go a long way in enhancing the preparedness of hospitals in handling any disaster if and when it strikes.

Sh. Kamal Kishore
Member Secretary
·Incharge

Sh. Krishna S. Vatsa
Member

Sh. Rajendra Singh
Member

Lt.Gen. Syed Ata Hasnain (Retd.)
Member

Message

The role that health facilities, especially hospitals, can play in response to emergencies and disasters can hardly be undermined. Thus, the loss to health infrastructure as well as economic losses can be humongous when hospitals are destroyed or damaged due to poor construction or improper planning for disasters.

An effective design and implementation of disaster management plan entails seamless coordination between three different types of stakeholders. The first are technical experts and scientists who study the phenomenon of disaster in detail and develop in depth understanding of the mechanisms thus proposing measures for prevention, early detection and proper response. The second are implementers, for example the leaders, managers and employees in the hospital who are involved in the day-to-day activities. The third set of stakeholders are management experts who are concerned with the design of structure, systems, and processes for enabling designing, owning and implementation of the disaster management plans in the hospitals.

Implementation can be strengthened by creating a culture of safety since that culture will ensure regular capacity strengthening programmes, sound hospital safety assessment and planning, and strengthen compliance. For this to happen, a management approach has to be adopted.

For developing and implementing these Hospital Safety Modules, a multi-stakeholder approach has been adopted keeping in perspective that every stakeholder has a different role and responsibility to play. Thus, every stakeholder must be made a participant. Ensuring capacity, commitment and communication at all levels is the only way to make a hospital a highly resilient and high reliability organization and once this is achieved, a culture of safety is bound to continue.

Development of the Modules for Hospital Safety is a crucial step in this direction and we hope that by using these, Hospitals of India will become Safe hospitals, thereby contributing to the country's strategy for disaster risk reduction.

Rajesh Chandwani
Faculty, Human Resource Management Area
Dr Lal PathLabs Chair in Healthcare
Indian Institute of Management Ahmedabad.

Foreword

The World Health Organization (WHO)recognizes a Safe Hospital program as an essential component of a country's strategy for Disaster Risk Reduction (DRR)and, in particular, Emergency and Mass Casualty Management. The number of healthcare facilities in India, including both big and small hospitals, is growing by the day. Various government and accreditation agencies have mandated that every hospital ensure strict adherence with various structural, functional and safety norms and guidelines to ensure Hospital Safety and preparedness for disasters in accordance with the National Disaster Management Act, 2005, and the National Disaster Management Authority (NDMA)Guidelines on Medical Preparedness and Mass Disasters (2007) and NDMA Guidelines on Hospital Safety (2016). However, it is not unusual to hear of instances where hospitals and their patients have suffered due to some internal or external disasters.

Strict adherence to Hospital Safety norms and guidelines is possible only when every stakeholder is aware of these guidelines and of the consequences of non-adherence and has the knowledge, commitment, and capacity to execute their specific roles in ensuring Hospital Safety. Effective preparedness and responsiveness to disasters entail adequate and timely training of the medical community on how to respond to different types of disasters, both natural (earthquake, tsunami, cyclone etc.) and man-made (technological, terror attack etc). Such responses can mitigate the severity of the consequences of a disaster. These aspects depend on the design and implementation of a robust Hospital Disaster Management Plan (HDMP).

Disasters in hospitals not only have grave economic implications in terms of the investments required to reconstruct hospitals and restore damaged equipment, but they also affect healthcare delivery and create social challenges. Consequently, the NDMA has issued detailed guidelines on Hospital Safety. However, the effectiveness of these guidelines not only entails ensuring compliance with them but also creating a culture of safety, conducting regular capacity strengthening programs and undertaking detailed Hospital Safety assessments. Such a broad-based initiative requires a multi-stakeholder approach in which capacity, commitment and communication at all levels are essential.

The NDMA has entrusted the Indian Institute of Management Ahmedabad with the task of developing this training manual on Hospital Safety, which adopts a multi-stakeholder approach to capacity strengthening and resilience building. The training modules aim to support training on Hospital Safety for four levels of stakeholders in hospitals – (1) Nurses and Frontline Staff, (2) Doctors and Managers, (3) Leadership Teams and (4) Assessors. The training modules will enable the hospital teams to adopt an "all-hazards approach" to assess Hospital Safety and develop a HDMP that can be used in response to all kinds of hazards that can lead to disasters. This document also explains the roles and responsibilities of all stakeholders in the face of disasters.

We hope that the clear and detailed training modules will enable hospitals to prepare for and respond to any disaster – internal or external – that comes their way.

Errol D'Souza

Errol D'Souza
Former Director,
(Jan. 2018-Feb. 2023)
Indian Institute of Management Ahmedabad

The Way Forward

Hospitals are the first point of care and treatment during disasters and thus, it is most crucial for hospitals to be safeguarded from, and to be resilient to disasters. This requires the hospitals to be well prepared for facing the disaster, manifest appropriate and swift response to the disaster and also to engage in post disaster relief measures. This entails involvement of hospital personnel across levels.

The need for ongoing capacity strengthening programs for all the stakeholders of hospitals cannot be undermined. I am sure these training modules will help in increasing the awareness of various stakeholders including the frontline staff, doctors, nurses, the managers, leadership, and the auditors on various aspects of disaster management. It will also facilitate strengthening stakeholders' capacities for handling internal and external disasters and enable them to undertake more effective monitoring and evaluation of disaster preparedness for their own set-ups.

The pragmatic approach taken to design these manuals and the comprehensiveness of the training material enable the adaptability of the modules by the hospitals. I am hopeful that going ahead, these training modules will prove to be assets in the hands of the hospital owners, managers, and the medical fraternity to efficiently deal with natural and manmade disasters in order to make hospitals safe and resilient.

My best wishes to NDMA for its future endeavours.

Prof. Bharat Bhasker
Director,
Indian Institute of Management Ahmedabad

Intended Participants of the Training Manuals

The Manuals and Trainers' Notes are intended to train four basic stakeholder groups working in/with hospitals, who are listed as follows:

Course Name	Level of Training	Intended Participants
HDM Basic	Level 1 – Basic Awareness	Nurses and Frontline Staff
HDM Intermediate	Level 2 – Mid-level Awareness	Doctors (Junior and Senior)
HDM Advanced	Level 3 – Advanced Level Awareness	Leadership Team
HDM Assessor	Level 4 – Hospital Disaster Management Assessor	Internal Auditors

Disclaimer

This document is intended for educational and practical use by hospitals and their stakeholders to promote Hospital Safety by strengthening their resilience against disasters. The references used in preparing the document are listed at the end. The authors and/or the reviewing teams do not intend to derive any commercial benefits from the Manuals and Trainers' Notes and, hence, all re-productions and references have been used in good faith.

Contents

Acknowledgements

Abbreviations And Acronyms

ALS	Advanced Life Support
BLS	Basic Life Support
CBO	Community Based Organization
DMC	Disaster Management Cycle
DDMA	District Disaster Management Authority
EOP	Emergency Operations Plan
HazMat	Hazardous Materials
HRO	High Reliability Organization
HDMP	Hospital Disaster Management Plan
HIRS	Hospital Incident Response System
HMS	Hospital Management System
HRVCA	Hazard, Risk, Vulnerability and Capacity Assessment
HVA	Hazard Vulnerability Analysis
HIS	Hospital Information Systems
IT	Information Technology
IRS	Integrated Response System
IEC	Information, Education and Communication
ICD	International Classification of Diseases
IoT	Internet of Things
KPI	Key Performance Indicators
NABH	National Accreditation Board for Hospitals & Healthcare Providers
NHSRC	National Health Systems Resource Center
NDRF	National Disaster Response Force
NDMA	National Disaster Management Authority
NCC	National Cadet Corps
NIDM	National Institute of Disaster Management
NSS	National Service Scheme
NYKS	Nehru Yuva Kendra Sangathan
PTSD	Post-Traumatic Stress Disorder
PIO	Public Information Officer
SDMA	State Disaster Management Authority
SDRF	State Disaster Response Force
UNIDSR	United Nations International Strategy for Disaster Reduction

1. Inaugural Session

1.1 Introduction

"The first impression is the last impression." This is a widely held belief and is especially true in the case of training programs. If the first session of a 2 to 4-day workshop is boring or irrelevant, participants are unlikely to be proactively involved through the workshop, even if the later sessions become more interesting. First impressions shape our views and perceptions. The session also sets the tempo for upcoming discussions and helps establish expectations for the program. Thus, trainers need to plan and conduct the inaugural session such that the participants find it interesting and absorbing. The opening session can run for up to 45 minutes.

The session can cover the following:

1. **Introduction of trainers:** The trainers can start by introducing themselves and the organization they come from.

2. **Introduction of participants:** The participants can be asked to introduce themselves by sharing their names, hospital's name (if the workshop is not being conducted in-house), and at least one interesting fact about themselves. It could be about a talent they have or a personality characteristic or anything else that they may like to talk about. The instructor can draw from these interesting facts in the later sessions – this will keep the participants engaged.

3. **Introduction to the purpose of the workshop:** The trainers can share:

    a. The purpose and learning objectives of the workshop.

    b. Some facts about India's vulnerability to disasters as well as the social, economic, psychological and physical costs of disasters. This will help set the tone for the workshop and explain its relevance.

    c. The session plan for the next few days and teaching approach.

    d. Ground rules for the workshop, which can be formulated jointly with the participants.

    > ### Ground Rules for the Workshop
    >
    > *Some rules can be:*
    >
    > - Keep mobile phones on silent or switched off.
    >
    > - Be on time for every session, especially after breaks.
    >
    > - Respect others' viewpoints and ideas.
    >
    > - Be attentive and proactive in sessions.

    Participants can be encouraged to share their expectations from the training program as well.

4. **Baseline survey:** It is very important to conduct a small baseline survey (Annex 1A) to understand the participants' current levels of knowledge regarding Hospital Safety. This can be compared to the end-line survey (Annex 1 B) to examining how

useful the training has been for the participants in enhancing their knowledge and changing their attitude toward Hospital Safety.

5. **Group exercises in the form of ice-breaking activities:** Conduct at least one exercise on building trust and another on challenging conventional thinking. One of the activities suggested is the "trust game". The trust game will provide insights into questions such as (a) why is trust important among team members? (b) how does it facilitate disaster response team dynamics?

The game challenging conventional thinking will help address questions such as (a) how does the brain get conditioned? (b) how does conditioning help/hinder disaster response?

For the fourth group, which includes the Internal Auditors/Assessors, a game on vigilance can be taken up instead of one of the above two options. Some suggested ice-breaking games are shared in the next subsection.

1.2 Understanding Decision-making During Disasters: Ice-breaking Activities

These activities/games will help set the ball rolling and bring in group cohesiveness. They will also help shed light on decision-making requirements during disasters.

1.2.1 Trust Games

One of the two suggested games may be taken up.

Back-to-Back Drawing:[1]

Have the participants organize themselves as pairs.
Make them sit back-to-back with each other (Figure 1.1).

a. One participant will sit with a paper and pencil; the other will be given a picture with a vague shape on it. The latter will instruct the former on what to draw based on what is shown in the picture. The aim is to see how accurate the drawing is based on the instructions provided.

Figure 1-1: Back-to Back Game

This team-building group exercise teaches participants to communicate and also rely on their team members. The entire activity should not take more than 10 minutes.

Tools required: pens, paper/pad, pictures

2. Obstacle Course Game

Ask the participants to arrange themselves in a line and then blindfold them all (Figure 1.2). Give them a rope and ask all of them to hold onto it. Then, they should be asked to walk from one side of the room toward the other. However, there will be obstacles placed along the way, such as chairs or stools. They have to try to navigate through the obstacles to reach their destination.

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1 https://www.tinypulse.com/blog/team-building-activity-trust

The participants can talk to each other to provide instructions. This exercise demonstrates the importance of trusting and relying on team members. Leadership skills may also be displayed by some participants. The entire activity should not take more than 20 minutes.

Figure 1-2: Obstacle Course Game

Tools required: Cloth/kerchiefs for blindfolds, rope, and items such as chairs or stools to be placed as obstacles.

1.2.2 Challenging Conventional Thinking

One of the two following games may be taken up.

The File

Figure 1-3: The File Game

Each participant should list as many uses as they can for a folder (Figure 1.3). The regular uses may be jotted down fast, but thereafter, they will have to think of more out-of-the-box, unconventional uses. This exercise illustrates how our assumptions about problems can get in the way of finding solutions.

The entire activity can be completed in 10 minutes.

Tools required: Nil

Tell a Story

The trainer can provide the beginning of a short story. After narrating two sentences, the trainer will stop. Thereafter, every participant will be required to add one line to continue the story. This will continue till it is the last participant's turn and the story is completed.

This activity can help participants understand the power of imagination and creative thinking in ensuring continuous improvement in problem-solving strategies.

Again, this entire activity can be completed in 10 minutes.

Tools required: Nil

3. Follow the Instructor

Ask the participants to form a circle by holding hands (Figure 1.4). The instructor will also be a part of the circle. The instructor then tells the participants that he will give them instructions to jump forward, back, right or left. However, the instructions would involve both verbal cues (instructor calls out) and visual (instructor performs). The participants will have to repeat (shout) the instructions while performing the action. The game will show if the participants are paying attention to the directions.

The instructor then says:

"Rule no 1: Say what I say and do what I do."

Then, he says "Jump right!" and the instructor jumps right.

The participants shout "Jump right!" and have to jump right – this will be easily accomplished. The instructor can repeat this with one or two directions and then change the rules.

Then the instructor says "Jump right!" but jumps left (discordance between visual and verbal cues). The participants have to say "Jump right!" but actually jump left. Most participants will goof up at this stage because of the conditioning of the mind.

To make things more complicated, there can be other rules such as: "Say what I do and do what I say."

Interestingly, even after a few rounds, the confusion remains.

Tools required: None

1.2.3 Vigilance Game (For Group 4 Only)

Odd One Out

The trainer will start by sharing the names of a series of associated things such as medical specializations, names of vegetables, birds, etc. In between, a non-linked word will be added – for instance, the name of a flower in between vegetable names. The participants must interject and identify the different word as soon as it is mentioned. This game encourages vigilance since the participants will have to interrupt the trainer when an association is made.

2. Description of Disasters, Epidemiology and Disaster Management

2.1 Trainers' Notes

The trainer must introduce and explain the below mentioned concepts during the discussions in the first session. These terminologies are not exhaustive, and some other key terms (such as response, preparedness, mitigation, etc.) will be introduced in the following modules.

Note: For all the technical terminologies related to disasters and Disaster Management, the trainer may refer to the resource material "*2009 UN-ISDR Terminology on Disaster Risk Reduction*" document (International Strategy for Disaster Reduction 2009)[2].

2.1.1 Disaster: Definition and Types

Originating from the ancient Greek words, "*dus*" (meaning "bad") and "*aster*" (meaning "star"), the word "disaster" indicates an extraordinary calamity caused by the position of planets. The United Nation International Strategy for Disaster Reduction (UN-ISDR) defines a disaster as a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses that exceed the ability of the affected community or society to cope using its own resources (ISDR, 2004).

Figure 2.1: Understanding a 'Disaster'
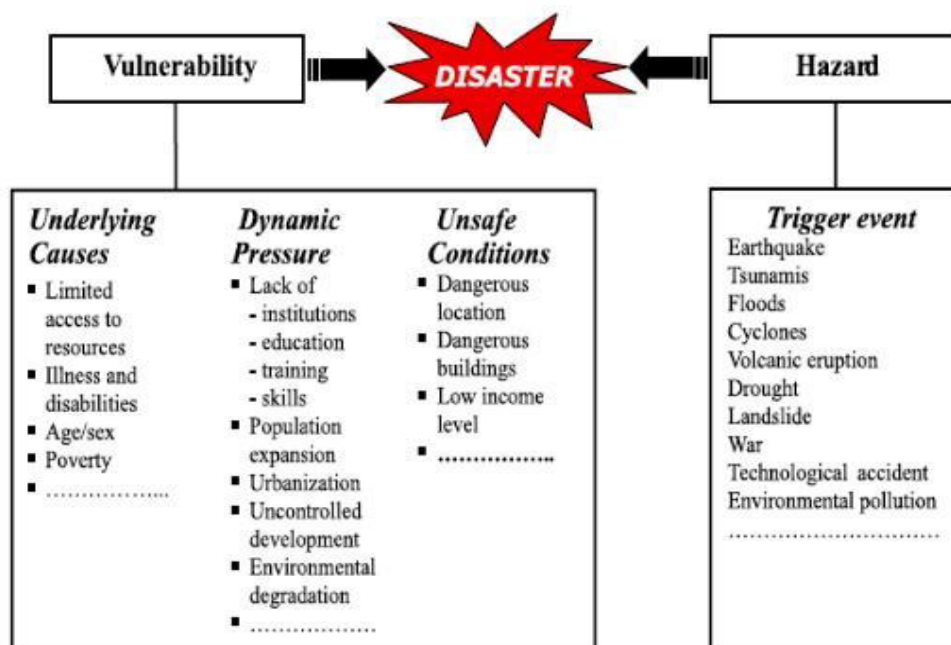
Source: WHO/EHA (2002)

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2   UNISDR, "2009 UN-ISDR Terminology on Disaster Risk Reduction", https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf.

A disaster occurs when a hazardous event such as an earthquake, cyclone, chemical leak, etc. occurs in combination with conditions of vulnerability, and there is insufficient capacity or preparedness to reduce or cope with the potential negative consequences (Figure 2.1).

Disasters have socio-economic as well as environmental consequences. A disaster can result in loss of life, disease, disability or injury. It can negatively affect human physical, mental and social well-being. It can also destroy or damage material possessions, property and essential services.

2.1.2 Vulnerability

Vulnerability is the inability, due to certain characteristics and circumstances, to avoid a hazard or respond to a disaster when it occurs. For instance, people living in coastal areas or an island are more susceptible to cyclones than people living on the mainland. Vulnerabilities may arise from physical, social, economic, and environmental factors.

Physical factors: Population density, location of settlement, type of construction, etc.

Social factors: Poverty and inequality, marginalization, social exclusion and discrimination by gender, social status, disability and age, psychological factors, etc.

Economic factors: The uninsured informal sector, vulnerable rural livelihoods, dependence on a single industry, globalization of business and supply chains, etc.

Environmental factors: Poor environmental management, overconsumption of natural resources, declines in risk-regulating ecosystem services, climate change, etc.

Vulnerability has three dimensions: (a) level of exposure to the hazard, (b) sensitivity to the hazard, and (c) the adaptive capacity of the individual or community (Andrade & Szlafsztein, 2018). Changes in any one of these can change the level of vulnerability (Refer Figure 2.2). Thus, vulnerability can vary within a community and over a period of time.

Figure 2.2: Dimensions of Vulnerability
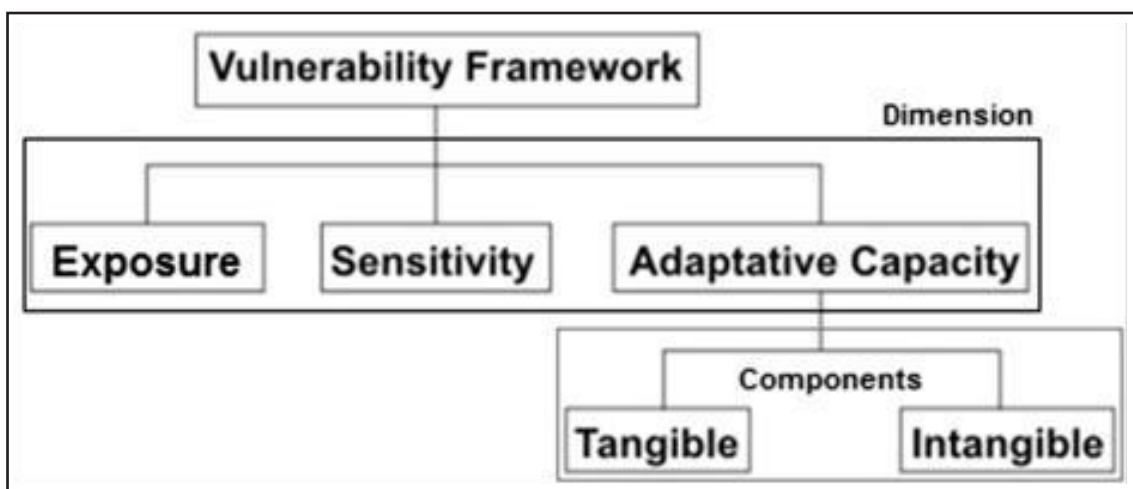
Source: Andrade & Szlafsztein (2018).

Many human actions have increased the vulnerability of communities to disasters. These include pollution, unabated and ruthless felling of trees, and reducing forest cover in the name of development and urbanization, and climate change to name a few. In order to reduce vulnerability to disasters, measures such as the following are required:

1. Government commitment to Disaster Risk Reduction (DRR).

2. Expansion of social welfare/protection initiatives by the government, especially for the poor.

3. Promotion of more integrated approaches to environmental, economic and social aspects of development, including improved land-use planning and ecosystems management.

4. Awareness generation about hazards and disasters and Disaster Management among the citizens of the country.

2.1.3 Hazard

A hazard is a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Hazards can broadly be classified into two categories: caused by natural factors and hazards caused by human factors that are associated with natural environments.

- **Natural factors:** Natural disasters result from the action of natural forces and tend to be accepted as unfortunate but inevitable. There are six natural hazard groups (refer Figure 2.3) and close to 20 hazard types and 47 perils (UN-ICSU, 2012).

- **Human/technological factors:** These result from some human activities, and include explosions/fires, the release of toxic chemicals or radioactive materials, nuclear reactor accidents, wars, bridge or building collapse, accidents such as car or air crashes, etc. They are difficult for communities to deal with and accept, since they are caused by human error, negligence or behavior, and thus are considered avoidable. Most of these, especially nuclear accidents, wars, release of toxic chemicals, etc., can have long-term adverse psychological as well as physical health impacts.

There can be one or more than one hazard occurring at one place. The former refers to the occurrence of a single hazard (e.g., floods), while the latter refers to multi-hazards. Multi-hazards may be independent of each other or interdependent. An example of an interdependent multi-hazard is a cloudburst triggering landslides triggering floods. Multi-hazard environments involve more complex, interactive processes, and therefore, their impacts on the built environment and people are different from that resulting from individual hazards happening in isolation. However, this does not necessarily mean that losses are greater in a multi-hazard event. They may, in fact, be greater in a region susceptible to one high impact or high frequency hazard, than in a region with multiple low impact or low frequency hazards. Thus, in order to understand the impact, it may be useful to apply some form of weighting relating to the impact of different hazards (Mukhopadhyay et al., 2016).

Figure 2.3: Peril Classification at the Family, Main Event and Peril Levels

Note: The association of perils with main events is solely a suggestion. Some perils may change their main event association based on the actual event and loss trigger (UN-ICSU, 2012).

2.1.4   Capacity

This refers to the combination of strengths, attributes and resources available within a community, society or organization to reduce the impact of a disaster. Strengths and attributes could include societal coping abilities, resilience, human knowledge, skills, and collective attributes such as social relationships, leadership and management. Resources would imply infrastructure and physical means, institutions, and even human resources.

2.1.5   Disaster Risk

Disaster risk comprises different types of potential loss that are often difficult to quantify. This could include loss of life, health status, livelihood, assets and services, which could occur in a particular community or a society over some specified future time period. Disaster risks can be evaluated and mapped to some extent based on knowledge of prevailing hazards and demographic patterns and socio-economic development.

Disaster Risk = (Hazard x Vulnerability)/Capacity

2.1.6 Disaster Risk Reduction

This refers to the practice of reducing disaster-related risks through systematic efforts to examine and address the causal factors of disasters, including by reducing exposure to hazards. It also aims to reduce vulnerability of people and property, involves wise management of land and environment, and improved preparedness in case of adverse events.

2.1.7 Disaster Risk Management

This refers to the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. It involves activities and measures for disaster prevention, mitigation and preparedness.

2.1.8 Emergency

This is a state in which normal procedures are suspended and extraordinary measures are taken to forestall a disaster. An emergency can be defined by the context of the social, political and epidemiological circumstances in which it occurs.

2.1.9 Emergency Services

Emergency services include specialized agencies such as the police, fire, ambulance, and civil protection authorities, paramedic and emergency medicine services, the Red Cross and Red Crescent societies, and specialized emergency units of electricity, transport, and communications providers and other related services organizations. These agencies have specific responsibilities and objectives in serving and protecting people and property in emergency situations.

3. Disaster Management Cycle

3.1 Trainers' Notes

Disaster (Risk) Management is an ongoing process. It includes all activities, programs and measures that are, or can be, taken up by governments, civil society and private entities before, during and after a disaster. The purpose of these activities is to either avoid the disaster, reduce its effect or recover from its losses to the extent possible. The entire process is cyclic in nature, hence the term Disaster Management Cycle.

3.1.1 Disaster Management Cycle

Appropriate interventions at all points in the cycle can lead to better preparedness and improved warnings. This in turn lowers susceptibility to disasters and their impact during the next iteration of the cycle. All the steps taken in the DMC also help in shaping or refining public policies and plans related to Disaster Management and Disaster Risk Reduction.

There are four phases in the DMC and these cover the pre-disaster, disaster and the post-disaster periods. These phases may not occur in the same order. Often phases of the cycle overlap, and the length of each phase depends on the severity of the disaster (Warfield, 2008).

Figure 3-1:Disaster Management Cycle
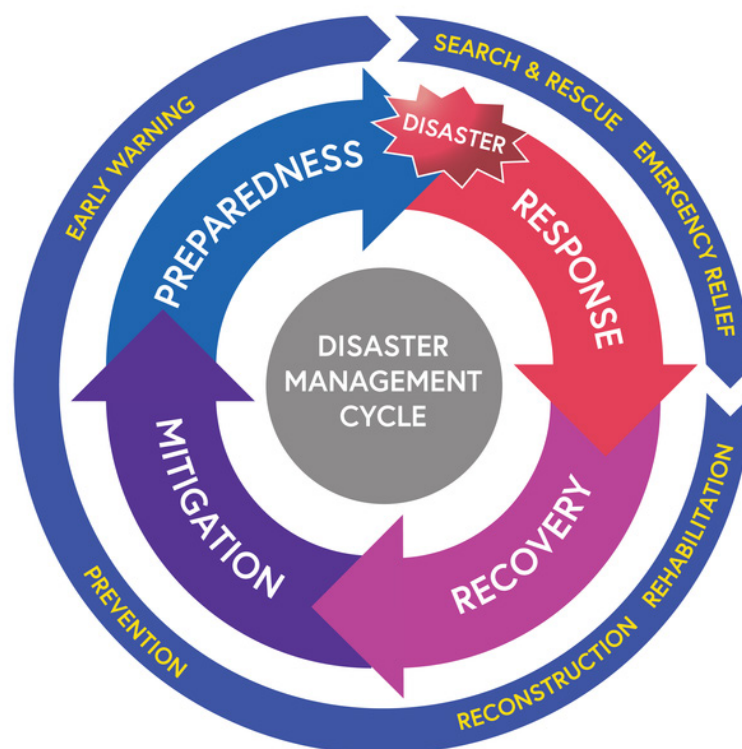
Source: Warfield, 2008

The four phases (Figure 3.1) are as follows:

1. **Mitigation** – This involves processes and activities linked to preventing and/or minimizing both, the probability as well as the impacts of a disaster. For instance, establishing building codes, building use regulations and safety codes; improving zoning and land-use management; and enhancing preventive healthcare and public education are some mitigation-linked activities. Mitigation depends on the integration of appropriate measures in national and regional development planning. The effectiveness of this phase is also dependent on factors like the availability of information on hazards, emergency risks, and the counter-measures to be taken.

2. **Preparedness** – This includes processes and activities linked to planning how to respond to disasters. During this phase, governments, organizations, and individuals make preparedness plans and conduct emergency exercises/training, deploy warning systems, make emergency personnel contact lists, etc., so that lives can be saved, the effects of disasters minimized, and disaster response operations enhanced. Preparedness actions, like mitigation, also depend on the incorporation of appropriate measures in national and regional development plans, and their effectiveness depends on the availability and optimal use of information on hazards and emergency risks and the remedy steps to be adopted.

3. **Response** – This phase involves carrying out emergency tasks targeted at minimizing the hazards created by a disaster, such as search and rescue operations, provision of emergency relief, etc. The rescue phase usually lasts for the first 48 to 72 hours after a disaster. Relief operations follow the rescue phase and may last between one and three months depending on the severity of the disaster. The objective is to meet the basic needs of the affected population until more permanent and sustainable solutions can be found. Humanitarian organizations play a key role in this phase by aiding in the provision of transport, temporary shelter in camps, and food and helping repair damaged infrastructure. In short, measures are taken to provide immediate assistance to maintain life, improve health and support the morale of the affected population.

4. **Recovery** – The recovery phase involves short and long-term rehabilitation and reconstruction measures to return the affected community back to normalcy after the disaster (UN-ISDR, 2009). Livelihood generation, temporary housing, public information, health and safety education, counseling programs, etc., are key activities in this phase. Economic impact studies and documentation of the lessons learned during this phase can further help strengthen mitigation measures.

The mitigation and preparedness phases are largely connected and occur in the pre-disaster period. Disaster management improvements are made in anticipation of a disaster event. Inappropriate development processes can lead to increased vulnerability to disasters and loss of preparedness for emergency situations.

Similarly, the response and recovery phases are also interlinked. There is no distinct point

at which immediate relief changes into recovery and then into long-term sustainable development. Recovery activities continue until all systems return to normal or better (Warfield, 2008). Recovery programs, coupled with heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement DRR measures and apply the "build back better" principle (UN-ISDR, 2009).

3.1.2 Types of Disasters, Public Health Implications (Response and Recovery Phase) and Vulnerable Populations

Some disasters strike unexpectedly and very rapidly, while other disasters begin with low levels of deteriorating environmental and socio-economic conditions. The below table classifies disasters into five major categories based on their onset and reflects on their public health implications (Assam State Disaster Management Authority & Doctors for You, 2013) and the populations most vulnerable during the response and recovery phases. The phases of mitigation and preparation are not discussed for their health implications since these are the phases when preventive health care and public education work best for all.

While in every disaster situation the affected community is most vulnerable, there are some categories of people who are more vulnerable than others given other factors such as their age, dependency on others, co-morbidities, etc (Table 3.1).

Table 3-1: Natural Disasters, Their Public Health Implications and the Populations Most Vulnerable to Them

S. No.	Natural Disasters	Public Health Implications	Most Vulnerable Populations (List Is Indicative, Not Exhaustive)
1	Sudden impact: earthquakes, cyclones, tsunamis, floods, volcanic eruptions, nuclear reactor explosions, etc.	Mass casualties, food insecurity, disease outbreaks	• Communities living in hazardous locations (e.g., fishermen and their families in case of cyclones and tsunamis) • Children and the elderly • Differently abled people (mental and physical) • Socio-economically under-privileged persons
2	Slow onset: drought, famine, pest infestation, deforestation etc.	Epidemics, malnutrition, high maternal and child mortality, mental ill-health	• Farmers • Socio-economically under-privileged persons • Children, elderly and those with compromised immunity and co-morbidities • Pregnant women or new mothers

S. No.	Natural Disasters	Public Health Implications	Most Vulnerable Populations (List Is Indicative, Not Exhaustive)
3	Epidemic diseases: waterborne, foodborne, vector-borne, etc.	Epidemics of cholera, dysentery, measles, respiratory infections, malaria, dengue and HIV	• All affected communities, especially those from socio-economically under-privileged backgrounds • Persons with co-morbidities and reduced immunity • Children and elderly • Women (especially from poorer families)
4	Industrial/ technological: pollution, fires, spillage, explosion, etc.	Mass casualties, high respiratory diseases morbidity	• All affected communities, especially those with co-morbidities and reduced immunity • Children and elderly
5	Complex emergencies: wars, civil strife, armed aggression, etc.	Mental ill-health, food insecurity, mass casualties, gender violence	• All affected communities. In particular, women, children, the elderly, and the differently abled
6	Others: transportation accidents, material shortage	Mass casualties	All affected communities

3.1.3 Role of Hospitals in Every Stage of the DMC

Hospitals play a crucial role in saving lives and reducing the suffering of injured people during and after disasters (Abbasabadi et al., 2019). However, hospitals have a different role and responsibility in Disaster Management in every phase of the DMC.

Mitigation/prevention stage: This is the phase wherein hospitals can work on strengthening critical systems, fire safety, and structural and non-structural safety aspects so that the hospital building is strong enough to withstand the effect of any disaster, if and when it strikes. In addition, the hospitals can develop a Hospital Incidence Response Plan during this phase.

Hospitals, as part of their social responsibility, can also engage in conducting preventive healthcare camps in the community, especially for socio-economically under-privileged populations. Public awareness campaigns can also be carried out to generate awareness about Disaster Management.

Preparation phase: During this stage, hospitals can proactively conduct mock drills to test their mass casualty management preparedness, emergency response system, fire safety, etc.

Response phase: Being largely response and recovery organizations during disasters, hospitals are meant to undertake Mass Casualty Management, triage of victims, etc. They are required to provide healthcare and emergency services to casualties and a safe environment for their routine patients, visitors, and hospital staff. Hospitals can also train their staff, especially nurses, to function as lay counselors during the mitigation phase to aid with the provision of psychological first aid for victims. This will enable them to listen to, and provide lay counseling and referral services to, patients if required during the relief period.

Recovery: Hospitals can continue providing healthcare services during this phase and also contribute to the rehabilitation of victims. For instance, the Psychiatric Department of many large hospitals can and do involve themselves in the psycho-social rehabilitation of victims.

4. The Role of Hospitals in Disaster Risk Reduction and the Disaster Management Cycle

4.1 Trainers' Notes

4.1.1 The Role of Hospitals in Disaster Risk Reduction[3]

For effective disaster risk management and risk reduction, not only is the management of disaster-related injuries and disease important, the patient's risk factors and underlying health determinants also need examination and management (Keim, 2016). Disaster-related health implications and even deaths can be reduced by health interventions that occur within a framework of primary prevention (preventing hazards and exposures); secondary prevention

Figure 4-1: Primary Prevention Activity

(preventing injury or disease following exposure); and tertiary prevention (preventing disability and death following injury/disease). Primary prevention: It is well known that healthy and well-informed people are better equipped to avoid hazards or reduce exposure. Thus, vulnerability reduction measures such as health promotion, education and preventive health services can be taken up by hospitals to build and maintain population resilience (Figure 4.1).

Figure 4-2: Secondary Prevention – Rescue and Relief

Secondary prevention: Hospitals can play a proactive role in emergency response activities such as rescue, mass casualty response, disease control, and hazardous material response, which are included under secondary prevention (Figure 4.2). These activities not only lead to early diagnosis, but also facilitate appropriate management of injury or disease.

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3   The role of hospitals' during the different phases of DMC have been touched upon in the previous session. Some more points are shared in this session for additional discussion.

Tertiary prevention: Appropriate triage management by hospitals can help prevent more severe injury, disability and death after a disease or injury occurs due to a disaster (Figure 4.3). Tertiary prevention measures require a network of curative health, rehabilitative health, communication and social services and the first two activities are well within the scope of a hospital.

Solutions to Challenges Faced by Hospitals During Disasters

Below are some solutions suggested for the challenges quoted earlier (Table 4.1). These suggestions are indicative and not exhaustive. Participants should be encouraged to think creatively and identify many solutions.

Figure 4-3: Triage Management

Table 4-1: Possible Solutions to Challenges Faced by Hospitals During Disasters

S. No.	Challenge	Possible Solutions
1	**Damage to the health facility itself**	• Strict adherence to National Building Codes, fire safety norms and other safety norms • Regular safety audits to ensure compliance • These will help in strengthening structural, non-structural and functional safety as well as the safety of critical systems
2	**Increased demand for services**	• Networking with other hospitals to make them partners in the efforts • Developing Mass Casualty Management and Emergency Operations Management systems and training staff on the same
3	**Lack of hospital preparedness**	• Preparation of a Hospital Disaster Management Plan • Regular mock drills • Capacity strengthening of staff • Compliance with safety norms
4	**Communication and information management**	• Keeping a back-up communication plan • Designating persons in the Hospital Incident Response Plan to deal with (1) media, (2) VIP management, and (3) visitor management etc. • There should be one Incident Commander who manages internal and external communications with the help of a team whom everyone acknowledges

S. No.	Challenge	Possible Solutions
5	**Resource constraints**	• Funds should be specifically allocated for disaster preparedness and management by the hospital • There should be regular audit of expenditures made under the disaster fund • Staff rotation should be done such that at any point in time, there is adequately trained staff for Disaster Management, should the need arise • Networking with other hospitals is crucial for the optimal use of medical equipment and technology. Sometimes hospitals share resources/space, which is very important during disasters • Security should be beefed up, especially using CCTV cameras and other security instruments
6	**Logistics and supply chain**	• There should be adequate stock of medical equipment and pharmaceutical supplies to safeguard against any disruption through better supply chain planning and management • If a hospital is small and does not have adequate resources or equipment, again, partnership with other hospitals is a possible solution
7	**Technical challenges**	• Development of robust triage and Emergency Operations Management systems and regular mock drills • Have proper evacuation plans in place with regular mock drills • Regular training of staff on all aspects of DM and six-monthly mock drills
8	**Coordination challenge**	• Having a comprehensive Hospital Incident Response System that details out the roles and responsibilities of all the hospital stakeholders during disasters • Regular trainings and mock drills

5. Hospital Disaster Planning: The Role of Standard Operating Procedures and Institutional Frameworks

5.1 Trainers' Notes

5.1.1 Hospital Disaster Planning: The Role of Standard Operating Procedures

Concept and Relevance of SOPs

Standard Operating Procedures (SOP) are an essential aspect of any quality system. They can be defined as "A set of directives, covering those features of operations that lend themselves to a definite or standardized procedure" (NIUA, 2017). Every good quality system is based on SOPs. In terms of Disaster Management, a SOP is a set of written instructions that are to be followed by an organization to mitigate and manage any disastrous event. SOPs are essential in any set up because they are developed with the purpose of maximizing efficiency, quality and uniformity of performance, while reducing miscommunication and working toward compliance with industry regulations.

Thus, in short, SOPs are written guidelines about what should be done, when it should be done, where it should be done, and by whom it should be done. The SOPs can take the form of a narrative, flow chart, process map, computer screen printout or a combination of all these or any other suitable form. However, they must be written in simple and effective language, which can be understood by all concerned.

Why Are SOPs Essential for Disaster Management?

There are various types of disasters and each of them are unique and may need to be handled in a different way. To add to this, there are multiple internal and external stakeholders involved in an emergency or disaster response. Each response agency, such as the army, fire services, and hospitals, may have their own idiosyncratic way of doing things by virtue of their own plans, policies, and methods. Even within the hospital, different departments may have their own ways of operating, leading to coordination problems and conflicts. This is where SOPs come in, since these written guidelines clearly spell out what is expected and required of personnel during emergency response and non-emergency activities. By communicating legal and administrative requirements, organizational policies, and strategic plans to all stakeholders in the same manner, they help to get everybody on the same platform (Rahat-Relief Commissioner Office, 2020).

Benefits of SOPs

SOPs offer several benefits (NHSRC, 2018):[4]

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4   National Health System Resource Centre. 2018. Draft SOPs for Hospital Management. © National health System Resource Centre, National Rural Health Mission, Ministry of Health & Family Welfare, Government of India

1. SOPs can be used as a set of "performance standards". They help in establishing and enforcing work standards. They can ensure that the same task is consistently performed by all workers and define the acceptable level of performance for a task.

2. SOPs also function as a set of "instructions". They instruct the worker on how to accomplish a task effectively, efficiently, and consistently.

3. SOPs can be used as a "reference" since they provide detailed information on the steps involved in a particular process.

4. They can be used for "review". They are particularly useful for auditors since they provide guidance on what to look for while auditing.

5. They also serve as personal controls to avoid performing wrong steps.

6. They provide the user with all the information they need with regards to safety, health, environment and operational information necessary to perform a job.

7. They support quality control; they lay down job steps that help standardize services and therefore quality.

Purpose of Hospital SOPs

In a hospital setting, there should be written SOPs for every step that involves patient care. They outline Key Performance Indicators (KPI) for clinical as well as non-clinical departments so that their performance can be measured. In India, this is also a requirement spelled out by accreditation agencies such as National Accreditation Board for Hospitals & Healthcare Providers (NABH). NABH recommends that hospitals have SOPs for as many functions as possible so that the hospital staff work as per the procedures laid down (Agarwal, 2019). This ensures quality care, patient safety and transparency in healthcare.

NABH has suggested the following SOPs for hospitals and has even prepared formats on the same (NABH, 2020)[5] that can be used by hospitals:

1. Access Assessment and Continuity of Care

2. Policies & Procedures on Care of Patients

3. Management of Medication

4. Policy and Procedures to Protect Patient Rights and Education

5. Hospital Infection Control Manual

6. Policies & Procedures on Continuous Quality Improvement

7. Policies & Procedures on Responsibilities of Management

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5   National Accreditation Board for Hospitals & Healthcare Providers (NABH). (2020). Template of Standard Operating Procedures SOPs. Accessed On 01 Oct. 20 from https://nabh.co/Template_of_Standard_Operating_Procedures_SOPs.aspx

8.	Policies & Procedures on Facility Management and Safety

9.	Human Resources Management

10.	Policies & Procedures on Information Management System

As part of its Hospital Safety enhancement measures, every hospital should have SOPs for Disaster Management. This is covered under point 8 above – "Policies & Procedures on Facility Management and Safety". This SOP can be further expanded to spell out the need to have develop a HIRS including a HDMP. There can also be two separate SOPs related to disasters: (1) Emergency, Triage and Mass Casualty Management and (2) Hospital Facility Safety, which includes fire safety norms, structural and non-structural safety, etc.

Implications of Non-Compliance with Hospital SOPs

Hospitals get licenses and accreditation to operate from national and international agencies only after their quality of facilities, quality of patient care and transparency in providing care are found satisfactory. Further, the license is to be renewed from time to time. Non-compliance with SOPs that are an essential part of the quality control system can have serious consequences for any hospital, especially if the breach leads to accidents or problems. In India, there have been many instances of hospitals losing their licenses due to violation or negligence of SOPs related to patient and hospital facility safety. One such case was the AMRI Hospital fire that took place on 9 December, 2011, in Kolkata, West Bengal. Over 90 people lost their lives due to a fire that took place due to a short circuit in the upper basement of the hospital. The impact was magnified due to the presence of inflammable waste material lying in the area. The hospital authority had illegally converted the upper basement floor assigned for car parking to a dumping store for empty and filled up LPG cylinders, torn mattresses, and wooden boxes (Pal and Ghosh, 2014). This was in gross violation of safety norms and procedures. The implications of non-compliance can best be understood through this case.

Loss of Life and Property

Patient safety as well as Hospital Safety was compromised due to negligence and non-compliance. Over 90 people lost their lives due to this incident and there was also substantial damage to property and medical equipment (refer Figure 5.1).

Loss of life and property is the biggest fall-out of disasters. Therefore, if a hospital does not adhere to hospital Disaster Management/Hospital Safety related SOPs, this is the biggest possible consequence it can face.

Figure 5-1:Loss of Life and Infrastructure

Fire at AMRI in Kolkata

Criminal Charges and Service Suspension

The state government suspended the license of AMRI Hospital with immediate effect. A judicial probe was ordered to investigate the entire disaster. Criminal charges were pressed against the directors, and six hospital directors were arrested under four non-bailable sections of the Indian Penal Code (Pal and Ghosh, 2014). In all cases of internal disaster within a hospital, particularly those caused by negligence, this is a likely consequence.

Loss of Reputation

Figure 5-2: Criminal Charges and Resultant Reputation Loss of Management

A hospital's public image is key to its success. Due to this episode and the media coverage, it received, the hospital attracted public attention for failing to comply with regulations. It lost its

reputation (Pal and Ghosh, 2014). If any hospital attracts public attention for the wrong reasons – ignoring patient safety, giving the wrong treatment, bad attitude toward patients, overcharging etc. – sooner than later, it can run the risk of loss of reputation (Figure 5.2).

Loss of Business

Suspension of activities is likely to lead to complete loss of work/business. Even in cases where a hospital's services were not shut down since the offenses were less severe, business is likely to be affected if there is a loss of reputation involved.

SOP Formats

Please refer to the SOPs for Disaster Management provided to help participants:

- Distinguish between a well-designed SOP and another which has gaps (Annex 3)
- Understand what goes into making a good SOP (See and Format for Policies & Procedures on Facility Management and Safety, NABH (https://nabh.co/Template_ of_Standard_Operating_Procedures_SOPs.aspx).

Challenges Hospitals Face During Disaster Preparedness and Management

Disaster managers in hospitals face a range of challenges when disasters occur. Some of these issues are outlined as follows:

Figure 5-3: A Hospital Bed Damaged during a Disaster

1. **Damage to the Health Facility Itself**

   - There can be structural damage.
   - There might be non-structural damage (Figure 5.3). The equipment and functional systems may be hampered.
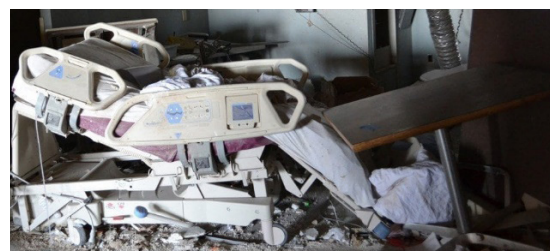
- Critical systems such as water, sewage, electricity etc. could stop working.

- There may be a need to evacuate the facility, which involves evacuating the staff and patients and safeguarding patient record systems.

2. **Increased Demand for Services**

- The hospital may be flooded with patients (especially in cases of a building collapsing, terror strike, earthquake etc.).Mass casualties can overwhelm a hospital, especially if it is a small one (Figure 5.4).

Figure 5-4:Flooding of Patients in a Hospital During a Disaster

- Dealing with patients' families, the media etc. can drain the hospital staff.

- Weather abnormalities, malnutrition caused by a disaster (such as drought), increased outbreaks of communicable diseases, an increase in displaced or refugee populations due to a disaster, disruption of sanitation services, failure to restore public health programs and high population density are some conditions that could overwhelm a hospital.

3. **Lack of Hospital Preparedness** (Nakhaei, Khankeh, Masoumi, Hosseini, & Parsa-Yekta, 2015)

Figure 5-5: Lack of Safety Demonstrated by a Blocked Fire Exit

- There might be a lack of prior planning for disasters.Insufficient or negligible training of personnel on DM, including mock drills.

- Negligence or violation of safety norms due to complacency and lack of foresight about the consequences of a disaster event (Figure 5.5).

- Lack of attention given to the experiences and lessons of previous disasters

4. **Communication and Information Management**
(Ardalan, Mowafi, & Khoshsabeghe, 2013)

- Communication tools can be suspended. This is known to happen during floods, cyclones, etc. Wi-fi networks may go down, and mobile and local telephone networks may get disrupted.

- Contact with the media and the provision of information can become a challenge.

- Internal communication amongst departments within the hospital can get hampered.

- External communication with other required DM agencies such as the fire department, law enforcement and other hospitals is critical. Its absence can magnify the negative impact of a disaster (Figure 5.6). The management of very important persons and visitors, such as patients' families, poses additional challenges.

Figure 5-6:: Example of Communication Failure

5. **Resource Constraints**

    - A hospital may not have the required space for providing services to injured people (refer Figure 5.7 for evacuation related space constraints that may occur).

    - The hospital may have inadequate finances to meet the demands of a disaster.

Figure 5-7: Evacuation of Patients During a Disaster

    - It may not have the required human resources or it may have capacity constraints.The security staff or security systems in place may be inadequate (this was true in the case of Cama and Albless Hospital, when the Taj terror strike took place in 2008) (refer Annex 14 for case study).

6. **Logistics and Supply Chain**

    - The supply chain (medical equipment and pharmaceutical supplies) may get temporarily disrupted.

    - Existing medical equipment and resources may not be enough to handle the demand for health services.

7. **Technical Challenges**

    - The triage and prioritization of patients can pose a technical challenge.

    - If the hospital itself is under threat, moving patients, valuable equipment and Hospital Information Systems (HIS) can be difficult.

    - Patient security, especially in the case of terror strikes, fires etc., is paramount, because the patients are considered under the care and responsibility of the hospital when a disaster occurs.

8. **Coordination Challenges** (Pouraghaei, Jannati, Moharamzadeh, Ghaffarzad, Far, & Babaie, 2017)

Figure 5-8:A Lack of Coordination and an Integrated Command can be Problematic

- Coordination is one of the biggest challenges (Figure 5.8).

- There can be coordination problems between humanitarian agencies, volunteers and other DM agencies which are supposed to work in close coordination with the hospital on the incident response plan.

- It is not unusual to hear of a lack of coordination amongst hospital officials and between departments.

- Sometimes hospitals are required to work together during an emergency response but there could be a lack of coordination amongst the authorities at different hospitals.

- A unified command led by a single entity may be absent, and hospital staff may not heed their seniors' advice.

- Chaos and confusion caused by a sudden disaster may add to coordination challenges.

5.1.2 Ingredients of a Good SOP for Hospital Emergencies and Disaster Management

Purpose

An SOP should clearly its purpose. In the context of hospital emergencies and DM, it could offer guidelines for the provision of immediate relief for and treatment of patients arriving at the hospital with acute medical emergencies caused by injuries due to a disaster.

Scope of Services

The SOP should clearly mention its scope of services, ranging from providing episodic, primary and acute (comprehensive) care to offering referrals.

Responsibility

The responsibilities of hospital staff for each activity should be clearly outlined in the SOP. If any committee needs to be formed, details about this should be mentioned.

Standard Procedures.

Finally, the standard procedures should be clearly spelled out. They should state the relevant activities, the designation of the staff responsible for each activity and any reference document, register or form to be used for the activities. For instance, for treating patients, an initial activity could be obtaining consent for the treatment;

responsibility would lie with the nursing staff and the document to be used would be a consent form.

5.1.3 Institutional Framework for Disaster Management

The policy and institutional mechanisms for DM were established when India gained Independence. However, whenever disaster has struck since, the focus has largely been on rescue and relief operations. Thus, this initial model was primarily reactive.

In 2005, however, the Disaster Management Act was passed in the Indian Parliament, and subsequently the National Policy on DM was approved in 2009 (NDMA, 2009). These two laws provide a comprehensive legal and institutional framework which forms the basis of the current DM paradigm. The present model, which has received increased attention in the last 15 years, marks a shift to a proactive approach which entails mitigation and preparedness in addition to response, relief and rehabilitation. The Tenth Five-year Plan (2007–12) also reflects this significant policy shift (NIDM, 2014). The Disaster Management Act, 2005 mandated the establishment of new institutional structures at the national, state, district levels for DM. As such, the National Disaster Management Authority (NDMA), State Disaster Management Authorities (SDMA) and District Disaster Management Authorities (DDMA) were created. Refer to Annex 4 (provided as a handout) for the Institutional framework for Disaster Management in India as mandated by the Disaster Management Act, 2005

National-level Structure

- The **Ministry of Home Affairs (MHA)** in the central government has the overall responsibility for DM in the country. For a few specific types of disasters, concerned ministries have the nodal responsibilities for the management of the disasters.

- The **NDMA** comes under the MHA. Under the chairmanship of the prime minister (PM), the NDMA is the primary body responsible for laying down policies, plans and guidelines for DM and for coordinating their enforcement and implementation throughout the country.

  o There can be a maximum of nine members in the NDMA excluding the PM.

  o The National Institute of Disaster Management (NIDM) and National Disaster Response Force (NDRF), two key bodies related to DM, come under the NDMA.

  o The NDMA recommends guidelines for the minimum standards of relief to be provided to victims of disasters.

  o In cases of disasters of severe magnitude, the NDMA can offer relief by repaying loans for or granting fresh loans to people affected by the disaster on concessional terms, as deemed appropriate.

- The **National Executive Committee (NEC)** is required to assist the NDMA in the discharge of its functions and ensure compliance with the directions issued by the central government.

o THE NEC comprises the union home secretary as chairperson, the secretaries to the Government of India (GoI) in the Ministries/Departments of Agriculture, Atomic Energy, Defense, Drinking Water Supply, Environment and Forests, Finance (Expenditure), Health, Power, Rural Development, Science and Technology, Space, Telecommunications, Urban Development and Water Resources, chief of integrated defense staff and chief of the staff committee.

o Secretaries in the Ministry of External Affairs, Earth Sciences, Human Resource Development, Mines, Shipping, Road Transport & Highways and secretary of the NDMA are special invitees to the meetings of the NEC (NIDM, 2014).

o The NEC prepares the national plan (for DM for the whole country) in accordance with national policy and in consultation with state governments and expert bodies or organizations in the field of DM. The plan must be approved by the national authority (Disaster Management Act, 2005).

● The **NIDM** is responsible for human resource development and capacity building for DM within the broad policies and guidelines given by the NDMA.

● The **NDRF** is the specialized force for disaster response; it works under the overall supervision and control of the NDMA.

State-level Structure

● The State **Disaster Management Department (DMD)**, which is largely positioned in the revenue and relief department, is the nodal authority for DM at the state level.

● The **SDMA**, headed by the chief minister (CM), lays down policies and plans for DM in states.

o There can be a maximum of nine members in the SDMA excluding the CM.

o The SDMA offers detailed guidelines for providing relief to people affected by disasters in states.

● The **State Executive Committee**, formed by the state government, is required to assist the SDMA in the performance of its functions and to coordinate action and ensure compliance with the guidelines given by the SDMA.

o The State Executive Committee consists of the chief secretary to the state government, who is chairperson, ex officio, and four secretaries of such departments as the state government may see fit, ex officio.

o The State Executive Committee may, as and when it considers necessary, constitute one or more sub-committees, for the efficient discharge of its functions.

o The State Executive Committee prepares the state plan (for disasters in states) in accordance with the NDMA Guidelines and after consultation with local and district authorities and the people's representatives, as the State Executive Committee deems appropriate.

District-level Structure

- The **DDMA**, established by the state government for every district, is the nodal body for DM at the district level.

    o   The district magistrate/deputy commissioner heads the DDMA; the elected representative of the local authority serves as the co-chairperson.

    o   There are seven members in the DDMA, excluding the chairperson.

    o   The DDMA is responsible for planning, coordinating and implementing the DM plan at the district level.

    o   The DDMA, may, as and when it considers necessary, constitute one or more advisory and other committees for the efficient discharge of its functions.

    o   The district authority prepares the district plan (for DM) in consultation with local authorities and in accordance with the national and state plans. The district plan must be approved by the state authority.

5.1.4   NDMA Guidelines Related to Health and Hospital Safety

The NDMA has issued several guidelines related to DM. The following specifically pertain to healthcare and Hospital Safety:

- Guidelines on Disability Inclusive Disaster Risk Reduction (September 2019)

- Guidelines on Hospital Safety (February 2016)

- Guidelines on Seismic Retrofitting of Deficient Buildings and Structures (June 2014)

- Guidelines on National Disaster Management Information and Communication System (February 2012)

- Guidelines on Psychosocial Support and Mental Health Services in Disasters (December 2009)

- Guidelines on Management of Chemical (Terrorism) Disasters (June 2009)

- Guidelines on Management of Nuclear and Radiological Emergencies (February 2009)

- Guidelines on Management of Biological Disasters (July 2008)

- Guidelines on Medical Preparedness and Mass Casualty Management (October 2007)

- Guidelines on Chemical (Industrial) Disasters (April 2007)

Other than these, there are guidelines for handling different kinds of natural disasters such as earthquakes, floods, tsunamis, droughts etc. The comprehensive list of guidelines can be downloaded from the NDMA website: https://ndma.gov.in/en/policy-and-plan/ndma-guidelines.html.

6. Hospital Safety

6.1 Trainers' Notes

6.1.1 What Is Hospital Safety?

A safe hospital remains accessible and functional at maximum capacity and offers services within its own infrastructure immediately following a natural disaster (UNISDR, WHO & World Bank, 2009). This includes all health facilities, irrespective of their level of complexity, size and location. A Safe Hospital will not collapse during disasters, killing patients and staff; can continue to function and provide services as a critical community facility when it is most needed and, is organized, with contingency plans in place and healthcare workers trained to keep the network operational (refer to Figure 6.1).

Figure 6-1:Factors affecting Hospital Safety

Structural aspects: Building design, location, quality of material etc.

Non-structural aspects: Equipment, furniture and critical systems like emergency exit, fire suppression, electricity, communication and water

Functional aspects: Operation theaters, medical services, etc.

Accessibility of the Facility
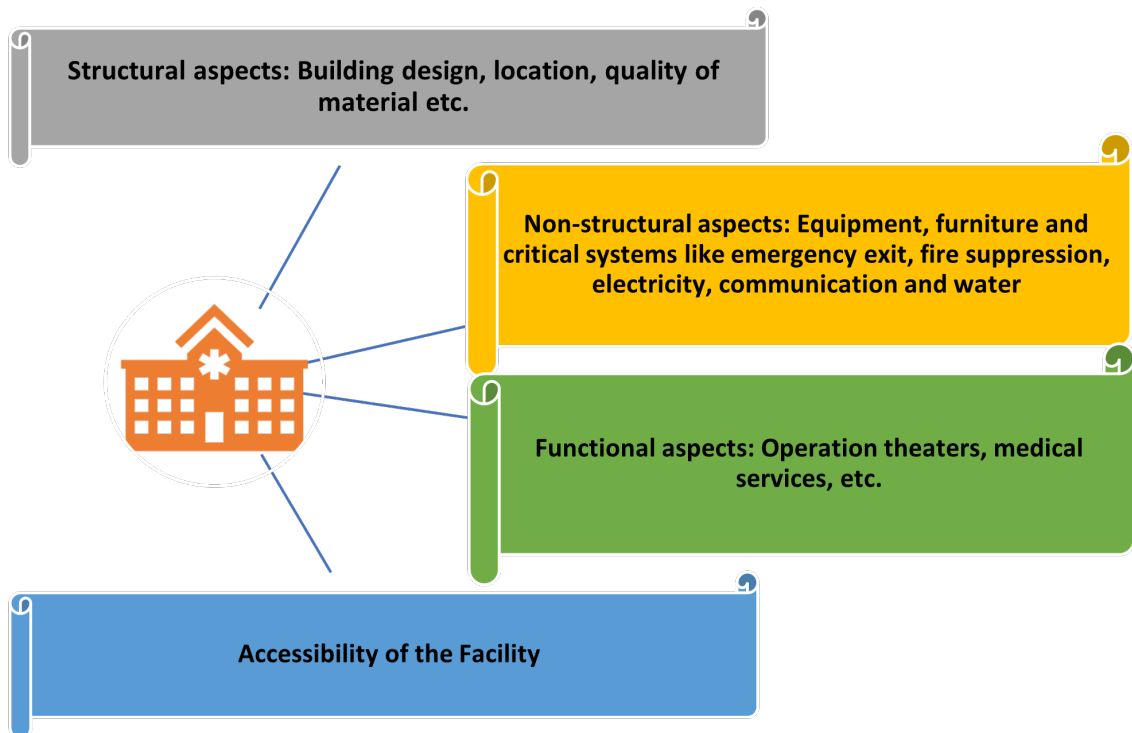
As Figure 6.1 shows, making hospitals safe involves understanding and mitigating factors that contribute to their vulnerability during an emergency or disaster. There are multiple factors, including structural ones such as the building's location, design (e.g., floor plan, elevation, mass concentration on storeys etc.), specifications and materials used, damage due to non-structural elements, and other human resource capacity related factors such as untrained professionals and a lack of basic understanding of DM. Critical services such as electricity, water, sanitation, waste treatment and disposal of medical waste are crucial to ensuring the continuity of operations during an emergency (NDMA, 2016).

Multiple stakeholders in the government and private sector need to work to ensure

Hospital Safety. The sectors/departments involved include planning, finance, public services, architecture and engineering, among others.

6.1.2 Context

The global disaster community met at a world conference with the aim to increase the scope of Disaster Risk Reduction and craft a plan of action in Kobe, Hyogo, Japan (PAHO & WHO, 2005). The Hyogo Framework for Action 2005–15, as it has come to be known, was adopted by 168 countries. One of the activities of the framework involved integrating Disaster Risk Reduction into the health sector. It spelt out the need for "making hospitals safe from disasters by ensuring that all new hospitals are built with a level of resilience that strengthens their capacity to remain functional in disaster situations and implement mitigation measures to reinforce existing health facilities, particularly those providing primary health care" (UNISDR, 2005, 11). In accordance with this objective related to Hospital Safety, the World Health Organization (WHO) and the Pan American Health Organization (PAHO) worked jointly on the world disaster reduction campaign, "Hospitals Safe from Disasters" (UNISDR, WHO, & World Bank, 2009). The focus of the campaign was ensuring the structural safety of hospitals and health facilities so that they could function during, and in the aftermath of, disasters. It also emphasized preparing healthcare workers to deal with natural hazards.

India, as a signatory to the Hyogo Framework for Action, has also worked proactively towards Hospital Safety. Indeed, the National Policy on Disaster Management, 2009 recognizes Hospital Safety as a national priority. Further, the NDMA published guidelines for Hospital Safety in 2016.

6.1.3 Why Is Hospital Safety Important?

A Safe Hospital program is integral to a country's strategy for Disaster Risk Reduction, especially with regards to emergency and disaster risk management.

Health facilities need to be safe because their damage/destruction entails huge implications:

1. **Health implications**: Health facilities are critical assets for communities not only in normal times, but also during emergencies, disasters and other crises.

2. **Economic implications**: Building a hospital involves huge investments in infrastructure. Hospitals account for up to 70% of the Ministry of Health's budget, and this investment may be wasted if the buildings are poorly constructed or destroyed/damaged during a disaster (WHO, 2015).

3. **Social implications**: Destruction of or damage to a hospital may lead to a loss of confidence and morale in the affected community and broaden the gap between formal systems and communities.

6.1.4   Aims of Hospital Safety

1.   To enable hospitals to function and provide appropriate and sustained healthcare during and following emergencies and disasters.

2.   To protect healthcare workers, patients and their families from disasters.

3.   To protect the physical integrity of hospital buildings, equipment and critical hospital systems at all times, including when disaster strikes. This safeguards economic investments as well.

4.   To make hospitals resilient to future risks, including climate change.

6.1.5   Structural, Non-structural and Functional Components of Hospital Safety

There are three key components of Hospital Safety:

1.   Structural components

2.   Non-structural components

3.   Functional components

Structural Components

These are the load-bearing components of a building that make it stand. The location, design specifications and materials used are also part of structural components. These are crucial for any building to withstand adverse natural events. Key building structures include the following:

▪   Foundation

▪   Column (posts and pillars)

▪   Beams (girders and joists)

▪   Slabs

▪   Walls

▪   Roof

Ensuring the stability of these elements is the responsibility of structural engineers, masons and labor contractors. Figure 6.2 indicates how damage to structural elements such as joints or columns due to an earthquake or other kinds of disasters can lead to a building collapsing.

Figure 6-2: Damage to joints or columns involves structural damage that can lead to a building collapsing

Non-structural Components

These elements are not part of the load bearing system of the hospital facility. They include architectural elements and critical systems.

1.   **Architectural Elements**

▪   Roof

- Ceiling

- Doors and entrances

- Windows and shutters

- Walls, divisions and partitions

- Exterior elements (cornices, ornaments, facade, plastering etc.)

- Floor covering

- Furniture

- Medical and laboratory equipment, supplies used for analysis and treatment etc.

2. Critical Systems

- Electrical system

- Communication system

- Water supply system

- Medical gas system

- Fire suppression system

- Emergency exit system

- Heating, ventilation and air conditioning systems in critical areas

Figure 6-3: Non-structural Components
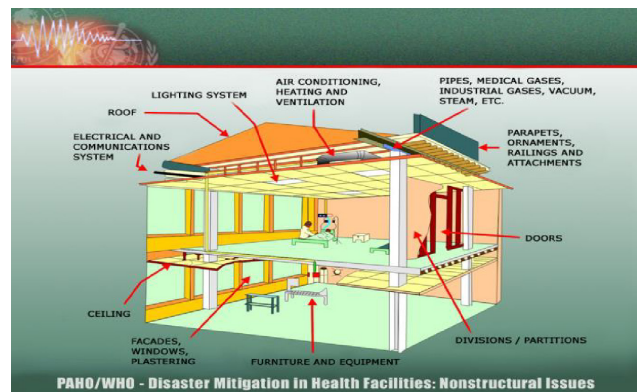
These non-structural components (Figure 6.3) are essential to daily operations and any damage to them would impact hospital functioning and may even cause physical injury to patients and personnel. Making sure of these elements is the work of architects, interior designers and mechanical and electrical engineers. After the hospital is constructed and functional, ensuring upkeep of these systems is the responsibility of the owners.

Functional Components

These include maintenance and administration and the aspects, operational systems and resources that ensure hospitals' functionality at maximum capacity even during disasters. Some key components include the following:

- Site and accessibility

- Internal circulation and interoperability

- Equipment and supplies

- Emergency SOPs and guidelines

- Logistic system and utilities

- Security and alarm

- Transportation and communications systems

- Human resources

- Monitoring and evaluation

6.1.6 Three-pronged Approach to Hospital Safety

A three-pronged approach to addressing the concerns at the ground level, collective level and discipline or larger level (refer to Figure 6.4) can provide ideal conditions to foster Hospital Safety.

Figure 6-4: Three-pronged Approach to Hospital Safety
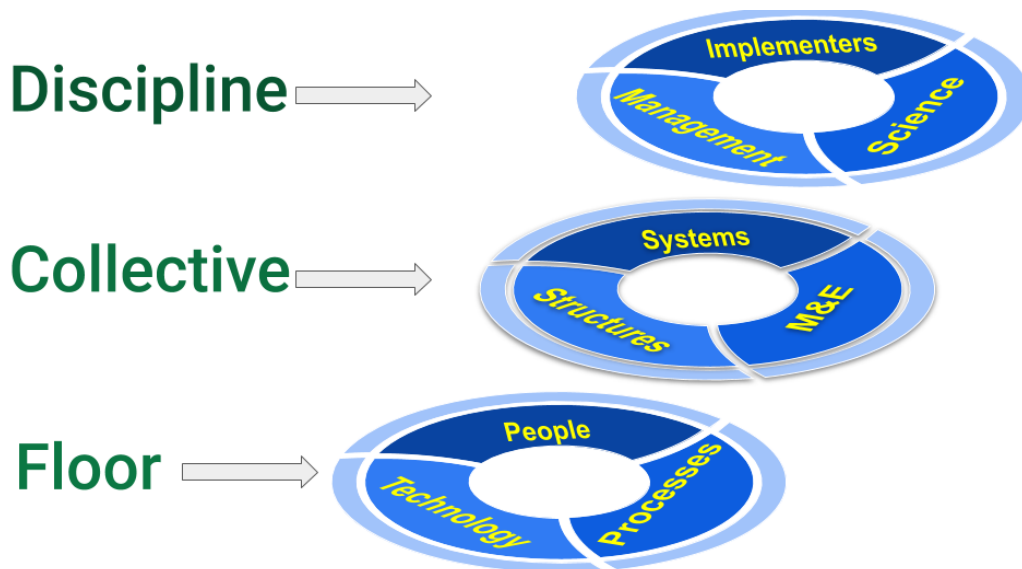
In order to address ground-level concerns related to Hospital Safety, the capacities of hospital stakeholders must be built, awareness on Hospital Safety generated, implementation processes established and technology effectively used. In addition, structures, systems, and monitoring and evaluation mechanisms should be clearly defined and implemented. Finally, at the larger discipline level, it requires interface between scientists, implementers and management.

6.1.7 Priority Areas for Hospital Safety

All discussions in this module are encapsulated in the framework developed by the NDMA called National Action Framework for Hospital Safety, which identifies five priority areas that will ensure Hospital Safety (Refer Table 6.1).

Table 6-1: Priority Areas for Hospital Safety

	Priority Area	Outcomes
Priority Area I	Strengthening institutional mechanisms	1. Policies, guidelines and ministerial directives enforcing safety are to be made mandatory for all hospitals in the country. 2. New codes mandating higher standards of safety in the design and construction of hospitals (structural elements, architectural elements, utility systems, equipment etc.) will be established. 3. An improved regulatory framework to ensure Hospital Safety will be created. For example, regular licensing and accreditation are to be made mandatory requirements for the continued functioning of hospitals following disastrous events. Current standards will be reviewed and upgraded to incorporate safety standards.
Priority Area II	Advocacy, awareness generation and education	1. Key decision-makers (at ministerial and institutional levels) are to be made aware, and be in agreement, that safety parameters for hospitals need to be incorporated at all levels and into all processes of healthcare delivery in the country. 2. All stakeholders at the grassroots level who are engaged in the design, construction and operation of hospitals need to be made aware of what is Hospital Safety and the need for it.
Priority Area III	Capacity building	1. The capacities of engineers, architects and hospital administrators (and even support staff like electricians and plumbers) engaged in designing, constructing, maintaining and operating hospitals are to be developed to address and include safety parameters to ensure safe and functional hospitals.
Priority Area IV	Preparedness, response and recovery	1. All hospitals in the country must have well documented DM plans, which are regularly tested and updated. 2. A comprehensive system of hospital networks should be established to enable resource sharing during emergencies.
Priority Area V	Risk reduction and structural mitigation	1. All new hospitals built must meet high performance standards and include regular maintenance and inspection. 2. Existing hospital structures should be retrofitted with the appropriate safety elements to meet new (higher) standards and pass regular inspections. 3. All architectural elements, utility systems, equipment and content in hospitals must be built and/or retrofitted to maintain performance levels and full functionality.

Box 6.1: Making Hospitals Safe: The Role of the Government and Hospitals

To make hospitals safe, the government has to ensure the following:

- Developing and implementing national policies, plans and programs on Hospital Safety.
- Evaluating and learning lessons from past experiences with emergencies and disasters.
- Selecting a safe site for the construction of a new hospital.
- Ensuring structural safety (design and construction).
- Adhering to the licensing and accreditation requirements, regularly assessing the safety of existing health facilities and retrofitting and making other improvements when required.
- Protecting healthcare workers, equipment, medicine and supplies.
- Ensuring that health facilities receive essential services.
- Developing partnerships between the health facility and other external partners involved in DM such as fire agency, police, NDRF etc.
- Developing emergency risk management programs and response plans.
- Testing and updating response plans with mock drills.
- Strengthening the capacity of all hospital stakeholders in regard to DM.

7. Hospital Safety Assessment

To assess Hospital Safety, all its components – structural, non-structural and functional –need to be evaluated through regular, careful inspection. Hospitals can prepare checklists or questionnaires to assess Hospital Safety. Alternatively, hospitals may use a standardized tool developed by the WHO; it is a comprehensive index that can be adapted as needed.

Hospital Safety Index Developed by the WHO[6]

This tool helps estimate the likelihood of a hospital/health facility withstanding disasters or emergencies, based on structural, non-structural and functional factors. The standardized Safe Hospitals Checklist assesses the level of safety in every possible area of the hospital. It also allows the health facility's level of safety to be monitored over time so that interventions can be made as and when required. This tool is particularly useful to countries and policy makers who are committed to Hospital Safety. It is inexpensive and easy for hospitals or government bodies to use in order to assess a Hospital's Safety and manage risk in the health sector.

Calculating the Hospital Safety Index

Based on responses to the index, a hospital can be identified as being in the low, moderate, or high safety category for each of the parameters in the tool. Hospitals can use the findings from the checklist to make improvements, as required.

The Hospital Safety Index contains two evaluation forms:

- Form 1: Involves entering general information about the health facility and the services it offers.

- Form 2: Safe Hospitals Checklist.

7.1.1 Maintenance of and Inspection for Hospital Safety: Structural, Non-structural and Functional Components

Any building and its facilities require regular maintenance to remain functional and long-lasting. Similarly, a hospital's functionality and performance also depend on its upkeep and maintenance. The hospital's management usually follows an intuitive maintenance strategy, which primarily involves electrical equipment and plumbing repairs. However, such maintenance is not enough to address the vulnerabilities of a hospital in times of disaster. Proper maintenance requires the evaluation of the interdependency of the structural, functional and non-structural elements (NSE) of a hospital (NDMA, 2016).

To be safe, hospitals have to develop and follow maintenance policies that are holistic, consider various potential hazards, address the needs in the order of priority and are cost effective. The NDMA Guidelines on Hospital Safety provide a framework for a suitable maintenance policy for hospitals. These are discussed as follows:

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6   WHO, "Hospital Safety Index", https://www.who.int/hac/techguidance/preparedness/hospital_safety_index_forms.pdf

Maintenance of Occupational and Functional Components

These components are not designed to resist hazards in the same way as the structural system is. Therefore, they are prone to damage during disasters and pose a risk to hospital and patient safety. Some steps a hospital must take for its maintenance are as follows:

- **Prepare a maintenance schedule**: The hospital should create a list of all its occupational and functional components and prepare a maintenance schedule accordingly. Equipment has service schedules prescribed by manufacturers and hospitals should comply with them. For items without a manufacturer's schedule, their importance, service requirements, quantity and vulnerability should be taken into account while working out the maintenance schedule.

- **Secure positions to prevent movement/falling**: Machines, like the CT scanner, X-ray, treadmills, lab and operation theater equipment, furniture and electronic items which are vulnerable to damage during a strong shaking should be secured so that they do not move and get/cause damage.

- **Improve detailing of service**: Strong shaking can cause electrical conduits, medical gas pipelines, water supply lines and other services to get interrupted. Improved detailing of these services will help avoid any disruptions of services during and after the disaster.

- **Regular inspection**: Non-structural and functional elements should be covered under the non-structural retrofitting program and then reviewed periodically during maintenance inspections using a checklist.

Maintenance of Structural Systems

Structural safety assessment/audit: This should be done at predetermined intervals to identify sources of structural distress and take remedial measures. Since hospitals are typically made of reinforced concrete, steel or masonry, different safety assessments will be needed in each case.

Inspection of Structural, Non-structural and Functional Components

Inspection procedures and their frequency should be outlined in the maintenance policy.

- All structural, non-structural and functional components are to be covered during inspection.

- Standard checklists should be used to report the findings from the inspection.

- Situations requiring special maintenance should be identified during the inspection.

The details of structural, non-structural and functional components must be covered in a standard format and are shared on pages 74 and 75 of the NDMA guidelines on Hospital Safety.

7.1.2 Licensing and Accreditation Requirements for a Safe Hospital

The NDMA, in its guidelines for Hospital Safety, clearly lays down standard licensing and accreditation requirements for hospitals to ensure disaster preparedness. Compliance

with these requirements will not only allow the creation of a comprehensive HDMP but also ensure its proper implementation when disaster strikes, because the requirements include adequate practice for disasters in the form of mock drills.

Licensing Requirements

Licensing involves granting official permission to a person or organization to use, do or own something. It is based on the action of a legislative body. Once a licensing law is passed, it becomes illegal for anyone to engage in the said activity/process, without obtaining a license. Thus, getting a license becomes a mandatory requirement.

Maintaining licensure is an ongoing requirement for healthcare organizations. A license is granted to a hospital only after the government's licensing authority ensures, through on-site inspection, that minimum required standards are being met, and there is proof of the hospital's competence. Licensing requirements for hospitals may vary from state to state, and based on the type of healthcare facility.

If a hospital complies with all structural and procedural requirements, without violating any norms, the safety of the hospital is ensured to a large extent.

Hospitals are required to acquire many necessary permits, certificates and approvals (NDMA, 2016) to function. Some of them, which are relevant to Hospital Safety are shared as handouts and annexed.

Accreditation

Accreditation (IAS n.d.) is the voluntary process of seeking external quality assessment and verification by an institution to demonstrate its competence, quality standards and reliability. Conformity assessment tasks may include, but are not limited to, testing, inspection or certification. The authoritative body (usually an independent agency) that performs the accreditation is called an "accreditation body".

The National Accreditation Board for Hospitals & Healthcare Providers (NABH) defines hospital accreditation as a "A public recognition of the achievement of accreditation standards by a healthcare organization, demonstrated through an independent external peer assessment of that organization's level of performance in relation to the standards."[7]

The various standards of accreditation are based on principles of quality assurance, evidence-based practice, medical ethics and the prevention of medical error.

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7   NABH, What is Accreditation. https://nabh.co/faq.aspx#:~:text=What%20is%20Accreditation%3F-,A.,in%20 relation%20to%20the%20standards.

Box 7.1: Benefits of Accreditation

1. Patients are serviced by accredited medical staff.
2. Hospitals compare with the best in the industry.
3. Accreditation ensures continuous learning, leadership, a good working environment and ownership of clinical processes.
4. Hospital staff are satisfied and content with work because of a good working environment and high service standards.
5. Hospitals can get empanelled by various insurance companies.
6. Accreditation provides access to reliable and certified information on facilities, infrastructure and level of care.
7. It ensures that hospitals play their expected roles in the national health system

Accreditation Requirements for Hospital Safety

The aim of accrediting hospitals should be to ensure effective and quick responses by the hospital team to meet the needs of affected populations during disasters. Some key aspects of DM for which hospitals should be accredited are as follows (NDMA, 2016):

I.   **Disaster preparedness measures for internal and external disasters**: Aside from having a written HDMP, hospitals should also have detailed protocols that address the following components of HDMP; they shall be evaluated and accredited for them.

1.   Coordination and management (including the Hospital Incident Response System [HIRS])

2.   Information, communication and documentation

3.   Safety and security

4.   Human resources planning and management

5.   Logistics and supply (of medicines, equipment, blood and blood products, medical gases, transport facilities, linen, food etc.)

6.   Financial management

7.   Continuity of essential services

8.   Triage

9.   Surge capacity and medical response

10.   Post-disaster recovery

11.   Patient handling

12.   Volunteer involvement and management

13.   Area-level networking for hospitals

14.   Coordination and collaboration with wider disaster preparedness initiatives

II. **Disaster mitigation measures**: Hospitals should be evaluated and accredited for required structural and non-structural mitigation measures as per the Hospital Safety guidelines and for the maintenance and inspection methodology of hospital buildings.

III. **Licensing requirements**: Hospitals shall be evaluated and accredited for their compliance with relevant acts, rules and regulations governing hospitals and healthcare facilities.

IV. **Capacity building**: Hospitals will be evaluated and accredited on the level of the awareness of their staff of hospital DM and the relevant plans, and on the training and mock drills staff have undertaken in preparation to respond to disasters in the hospital.

8. Introduction to the Hospital Disaster Management Plan

8.1 Trainers' Notes

8.1.1 Hospital Disaster Management Plan (HDMP)

An HDMP is a written document prepared by a hospital which contains comprehensive actionable plans for disaster mitigation, preparedness, response and recovery that correspond to the pre-disaster, disaster and post-disaster phases, respectively. An all-hazards approach is usually applied to general disaster planning.

Every stakeholder in the hospital should be aware of the presence of the HDMP; they should have relevant training, know about their role in the plan, and preferably be provided a copy of the plan for their reference.

8.1.2 Objective of an HDMP

The main objective of an HDMP is to prepare staff, institutional resources and structures of the hospital for effective performance during different disasters and soon after an emergency. A hospital with a good and practical HDMP should be able to provide round-the-clock, prompt and effective medical care, including emergency care, to as many people possible, so as to maximize recuperation and recovery and minimize mortality, morbidity, disability and suffering resulting from any disaster or mass casualty incident. After a disaster, the management and renovation of damaged areas must begin immediately so that the hospital is able to return to its routine services as soon as possible.

8.1.3 Concepts Involved in Designing an HDMP

As part of its HDMP, every hospital should develop its own HIRS to aid in effectively preparing for and responding to disasters. This should be done after a hospital vulnerability analysis. The objective of the HIRS structure is to facilitate the development of strategies, manage resources and plan and implement operations in emergency situations. Developing the hospital command center (HCC) and structure and incident action plans (IAP) are other key necessities. The hospital command structure (HCS) details the roles and responsibilities of each member of the HIRS and other critical hospital staff. Job action sheets (JAS) are thus prepared for every stakeholder. The IAP documents the goals related to the incident/event, operational period objectives and the response strategy defined by the incident command during response planning.

Through mock drills and tabletop exercises, the HIRS can be brought into practice. It should be updated or revised based on the gaps identified during mock exercises.

Figure 8.1 summarizes the concepts related to an HDMP and steps involved in designing the HDMP.

Table 8-1: Steps involved in Designing an HDMP
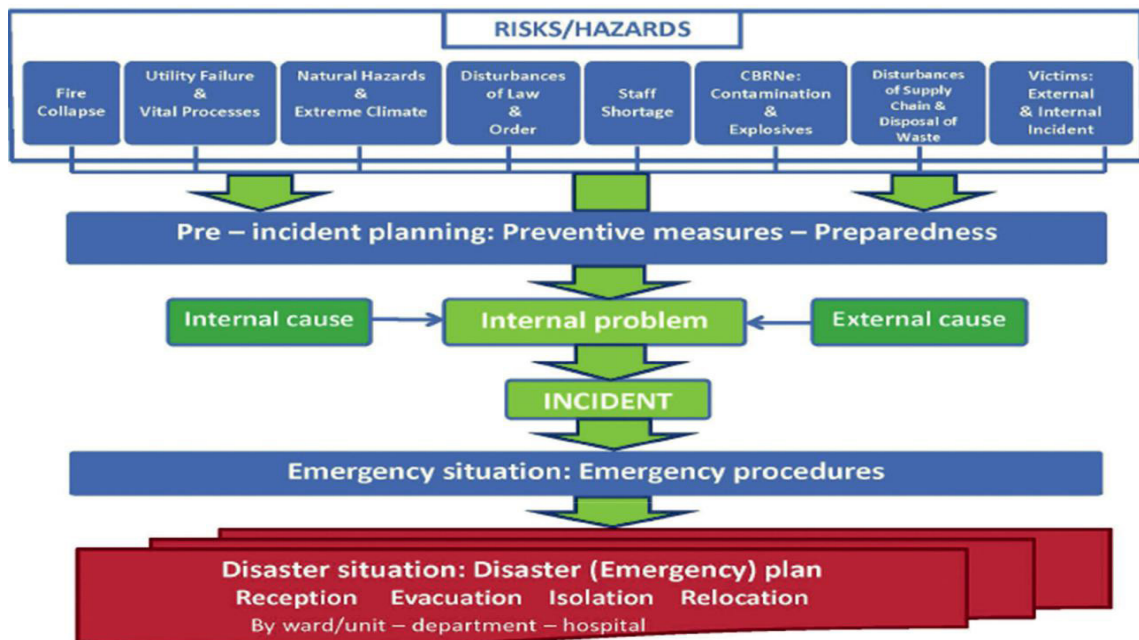
Source: Hendrickx, D'Hoker, Michiels, & Sabbe (2016)

All the systems and plans mentioned here will be described in detail in a subsequent module on preparing an HDMP.

8.1.4 Basic Principles to Consider While Preparing an HDMP

Pandemonium is bound to prevail, at least for some time, when a disaster or crisis strikes. However, the very aim of an HDMP is to minimize the window for chaos and restore normalcy swiftly. Some basic principles that should be considered while formulating a comprehensive HDMP are summarized as follows (UNDP India, 2012):

Flexibility: The HDMP should follow an all-hazards approach and be applicable to various hospital disasters, both internal and external.

Simplicity: The plan should be simple enough for every stakeholder to understand and implement.

Adaptability: While the HDMP lays out standard procedures for the management of a disaster/crisis, it should be adaptable to various requirements and changing vulnerabilities over time.

Anticipatory: In designing an HDMP, worst case scenarios should be accounted for.

Concise: The plan should be crisp and clearly specify various roles, responsibilities and work relationships of all stakeholders from medical departments, medical support departments (diagnostics), technical services department (IT, pharmacy etc.) and even the finance department.

Comprehensive: The plan should be broad enough to include networking with other healthcare facilities so that resources can be shared and excess patients transferred if necessary.

Predictability: The HDMP should have a predictable chain of management.

Connection: A hospital, as an embedded entity, should not make a plan in isolation. The HDMP should ideally be integrated within the regional plan for proper implementation.

8.1.5 Need for Awareness of and Familiarization with the HDMP

An HDMP should not be prepared and kept in hospital drawers, out of sight and out of mind. Instead, every staff member in the hospital, including security guards, administrators, nursing staff, technicians, Doctors, managers and Leaders, needs to be familiar with the HDMP and participate in mock drills which are part of the plan, so that they are well equipped to handle any crisis, emergency or disaster when it strikes.

9. Preparing and Developing the Hospital Disaster Management Plan

9.1 Trainers' Notes

9.1.1 Holistic Approach to Developing an HDMP

There are three aspects of a good HDMP. The first, technical aspect, is to ensure that the hospital facility, including its structural, non-structural and functional components are resilient to hazards and accidents. The second, management aspect, is that the hospital promotes a Culture of Safety amongst its staff. This requires committed and proactive leadership which fosters safety in the hospital. The last, practical aspect, is to ensure that there are structures, systems and processes in place before a disaster strikes, so the hospital and its staff are equipped to handle it (refer to Figure 9.1). This involves management and implementation skills.

Figure 9-1: Components of an HDMP
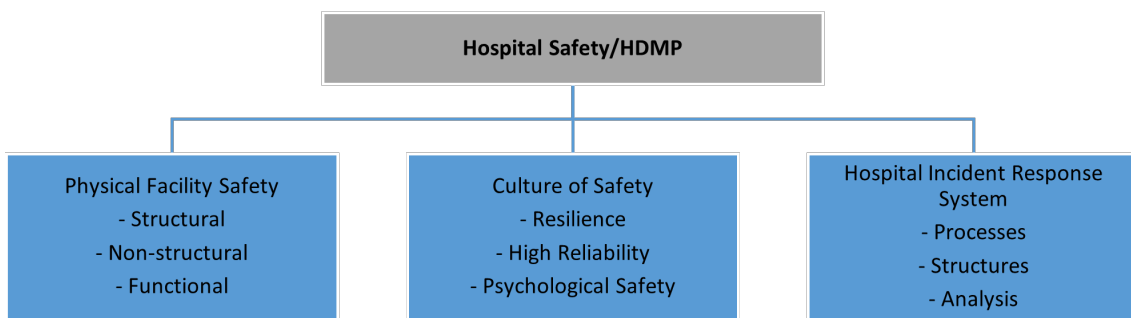
The first part, physical facility safety, has largely been covered under the module on Hospital Safety and its assessment. The second part, Culture of Safety, is also covered in the related modules. The third, the HIRS will be considered in this module. The NDMA guidelines (2016) state the minimum standards that a hospital shall adhere to, as part of its safety and disaster preparedness. These are shared in the following sub-section.

9.1.2 Minimum Standards for a Hospital Disaster Management Plan

Fulfilling the objectives of an HDMP is no easy task. There are several ingredients that go into making a good HDMP:

1. **Coordination and management**: These are key to DM and can be made efficient with a well-developed HIRS.

2. **Planning, training and drills on emergencies and DM**: Planning starts with conducting a hospital vulnerability analysis and capability analysis. Thereafter, the HIRS can be developed; it incorporates the HCC structure, individual roles and responsibilities and the hospital community coordination plan.

3. **Information and communication**: These aspects should be clear, accurate and timely for both internal staff and external people, to ensure informed decision-

making, effective collaboration and cooperation and public awareness.

4. **Safety and security**: Management protocols are crucial to eliminating or reducing hazards in the physical environment, managing staff activities, reducing the risk of injuries to individuals and mitigating the loss of property.

5. **Human resources**: People working for the hospital should be adequately trained and prepared for emergencies and disasters.

6. **Logistics, supply and finance management**: These functions are required for the continuity of the hospital supply and delivery chains.

7. **Continuity of essential services**: This can be done by ensuring adequate resources, hospital supplies, backup arrangements of utility services, a deployable evacuation plan etc.

8. **Triage management plan**: This is to ensure that the most serious patients are treated first.

9. **Surge capacity for medical response**: This should be calculated early in the planning process so that the disaster response structure can be established, expanded and contracted as per the requirement when an incident occurs.

10. **Post-disaster recovery plan**: The plan should confer responsibility on an official to oversee hospital recovery operations, assess when the disaster response can be deactivated and conduct a post-disaster assessment of the damages and time required to repair/replace/retrofit the facility, amongst other things.

11. **Patient handling**: Through an established plan, all patients can be made aware of the HDMP. All their needs and those of their family/visitors can be taken into account.

12. **Volunteer involvement and management**: A plan for volunteers should be made in the pre-disaster phase so that locals can be involved in all preparedness activities even from the pre-disaster phase. Volunteers can participate in all training and mock drills.

13. **Area-level networking for hospitals**: This is crucial, especially in scenarios where the number of patients requiring medical attention exceeds the hospital's surge capacity.

14. **Coordination and collaboration with wider disaster preparedness initiatives**: This is required as hospitals are part of a whole system and cannot respond to disasters in isolation. Networking enhances hospitals' own disaster preparedness and response readiness.

Most of these points come under the umbrella of the HIRS. The various steps involved in, and the key components of, the HIRS are elaborated upon in the next section.

9.1.3   What is the Hospital Incidence Response System?

The HIRS, known as the Hospital Incident Command System (HICS) in the USA, is an incident management system. Any hospital can use it to manage threats, planned events, or emergencies. The HIRS proposes an organizational structure for incident management and directs the process of planning, building and adapting that structure (EMSA, 2014).

It follows the same principles as the Incident Response System (IRS) which governments use at a macro level for DM planning and response. Therefore, it applies to all phases of the DMC, i.e., prevention, protection, mitigation, response and recovery, and follows an all-hazards approach. It is a flexible, scalable and adaptable system that can be used for emergency and non-emergency situations. Hospitals of all sizes, locations, patient types, patient volumes or hazard types can refer to a standardized HIRS and adapt it for use, considering their own requirements and resources.

Using the HIRS enables hospitals to apply a nationally recognized system that promotes successful incident management. Another major advantage of using the HIRS is that it strengthens the hospital's role in the community response effort as it aligns its functioning with that of the other response partners in the macro-level incident response system, which includes fire, law and local health agencies. Patients also benefit from efficient, coordinated action within the hospital and between community response partners.

9.1.4   Steps Involved in Preparing the HIRS

Forming a Disaster Management Committee

Every hospital should have its own hospital disaster management committee (HDMC). This committee is responsible for developing an HDMP; hence, all its members should be trained to establish and implement the HIRS for internal and external disasters. This committee should include multidisciplinary representatives – a staff physician and clinical/nonclinical representatives from key departments, functional units and the administration. This committee is responsible for maintaining documentation on disaster preparedness and impact assessment following disasters.

The chairman of the committee must be proactive and committed to the cause. Further, the committee should meet on a regular basis and establish an annual set of objectives, priorities and a work plan. Key activities of the committee should include the following:

- Developing an all-hazards HIRS as well as specific IAPs when the HIRS is activated during an incident.
- Conducting an annual Hazard Vulnerability Analysis (HVA) for the hospital.
- Conducting a competency and capability analysis of the hospital with respect to its disaster handling capabilities.
- Developing/updating SOPs based on findings from the HVA and organizing mock drills.
- Developing the HCS.

- Providing for the continuity of business operations through the development of business continuity plans.

- Ensuring the ongoing training of all hospital stakeholders in DM and clarifying their roles and responsibilities in the HIRS. This training should be arranged after a proper training needs assessment. Training should emphasize all-hazards and incident specific responses.

- Keeping the hospital management updated about all activities of the committee, the challenges it faces, resource requirements, program successes etc. This responsibility lies with the chairman of the committee.

- Working towards networking with other hospitals and potential disaster response partners.

Appointing a Program Manager for Emergency and Disasters

While the HDMC oversees the hospital's overall effort related to emergency and disaster preparedness, a program manager should be appointed specifically to facilitate the hospital's preparedness efforts. This person would be in charge of the groundwork, including the development of relevant policies and procedures, and the development and revision of the Emergency Operations Plan (EOP), training plans etc. They would be in close contact with HDMC members and report to the chairman. The program manager must have formal or informal training, education and experience in emergency management.

Hazard Vulnerability Analysis

The annual HVA is a prerequisite to developing an all-hazards EOP as well as specific IAPs. This is because the HVA exercise can help identify the internal and external hazards a hospital faces, based on which action plans can be developed.

While doing the HVA, three elements must be taken into consideration:

- **Probability of an event's occurrence**: This is calculated through a retrospective assessment of event frequency or predicted through an estimation of risk factors.

- **Impact of an event**: This refers to the severity of damage, resulting from a hazard, to human lives, business operations/infrastructure and environmental conditions.

- **Capability and competency of the hospital to withstand a disaster**: This is best determined during a mock drill.

The formula for risk calculation for a hospital is as follows:

Risk = Probability of Hazard **x Degree of** Vulnerability/Hospital Capability

Risk can be reduced by implementing threat mitigation activities focused on probability or severity.

Developing the Emergency Operations Plan

Planning for DM has to take into account the findings from the HVA. Changes in the HVA should be reflected in an updated EOP. Similarly, mock drills should be conducted for incidents such as fires, earthquakes or any other hazard that a hospital has a high probability of facing.

Plans should apply to all hazards. Further, they must take into account all the stages in the DMC. While developing plans, care should be taken that

- threats, hazards and any other risks are recognized.

- goals and objectives are set.

- there is flexibility so that the plan can be applied to all disaster scenarios.

- senior leadership and all stakeholders are involved.

- plans are constantly reviewed and updated to enhance preparedness.

Using the Incident Planning and Incident Response Guides

EMSA California, in its HICS Guidebook 2014 suggests the use of an incident planning guide (IPG) and an incident response guide (IRG). These documents, provided with the HICS Guidebook 2014, are meant to help hospitals improve their plans for common emergency situations by referring to best practices and actual incidents that other hospitals have experienced. These guides can be adapted for every hospital to use based on their individual requirements. Alternatively, they can be developed by hospital staff so that they are relevant to the local context.

The IPG includes situations that a hospital might experience, along with a list of suggested actions to mitigate, prepare for, respond to, and recover from the incident. The IRG provides possible response actions for the scenarios in the IPG, which are organized according to four specific time periods: immediate response (0–2 hours); intermediate response (2–12 hours); extended response (greater than 12 hours) and demobilization/system recovery.

Coordinating with External Partners

The hospital is part of a larger system. As an embedded entity, it has to work in close coordination with many other response partners during disasters for a smooth and speedy response. Thus, it is important for a hospital to know whom and when to call for resources or assistance during a disaster. Some key collaborations that the hospital management should work on are those with the following:

- SDMA and DDMA

- Fire and emergency medical services (EMS)

- Law enforcement

- Local health department

- Medical examiner or coroner's office (especially where mass fatalities are involved)

- Mental/behavioral health specialists

- Indian Red Cross Society

- Print and television media and social media

It is a good idea for hospitals to establish agreements with other hospitals to share resources and volunteers, and transfer excess patients between facilities if necessary. This point is covered in greater depth in a separate module, "Coordination with Multiple Agencies: The Hospital as an Embedded Entity".

Hospital Incident Management Team and Hospital Command Center

The hospital incident management team (HIMT) should comprise personnel working on the following components and associated branches, units and technical specialists:

- Command

- Operations

- Planning and logistics

- Finance and administration

Positions may be assigned on the basis of an assessment of the scope and magnitude of a particular situation and the availability of trained personnel to assume roles.

The HDMC can prepare a flowchart of the HIMT which depicts the various HIMT positions and their inter-relationships (refer to Annex 11 A for a standard HIMT structure). This flowchart is an important tool and, thus, it should be posted in the HCC and on boards

in common and prominent areas in the hospital so that everyone is aware of it. The HIRS is flexible and scalable and, therefore, the HIMT positions get activated based on the nature and scope of the emergency. While there are many positions on this flowchart, in a smaller setup with few staff, one person may assume multiple roles. Each hospital can adapt the HIMT structure based on its requirements.

Another tool, along with the HIMT flowchart is the HIMT depth chart (Refer Table 9.1). This one identifies the probable administrative and clinical positions that may be suitable to specific HIMT positions. This is explained further in the following table (Table 9.1):

Table 9-1: HIMT Depth Chart

HIMT Position	Possible Candidates
Incident commander	Chief executive officer/chief operating officer/chief medical officer/chief nursing officer/hospital administrator/nursing supervisor/emergency program manager
Public Information Officer (PIO)	Hospital PIO/marketing director/patient relations officer/safety director/chief engineer
Safety officer	Safety director/security chief/infection control officer/risk management officer/radiation safety officer/employee health officer/building engineer/emergency management coordinator
Liaison officer	Chief executive officer (CEO)/emergency management coordinator/risk management officer/chief information officer/community relations officer
Medical-technical specialist	Infectious disease specialist/infection preventionist/epidemiologist/chief of staff/chief of pediatrics/radiation safety officer/nuclear medicine officer/health physicist/chief of trauma/primary care director/behavioral health director
Operations section chief	Chief operating officer/chief medical officer/chief nursing officer/nursing supervisor/emergency management coordinator/strategic planning officer/vice president (VP) of administration/human resources director
Logistics section chief	Chief procurement officer/support services director/supply director/chief operating officer/facilities director/warehouse director
Finance and administration section chief	Chief finance officer/VP of finance/VP of business services/VP of administration/controller/comptroller chief information officer

A third tool that can be used is job action sheets. JAS lay out the roles, responsibilities, reporting relationships and potential action steps for every member of the HIMT. While every hospital can prepare its own JAS, the HICS Guidebook 2014[8] provides a detailed JAS for every HIMT member. Hospitals can use this document as a guide to prepare their own JAS. They can even customize the standard document provided for their use.

Briefly, Table 9.2 details the responsibility of each of the HIMT components. More elaborate information pertaining to the responsibilities of the incident commander, command staff, and chiefs of the four general sections is shared in Annex 11 B.

Table 9-2: Functions and Responsibilities of the HIMT

Function and Positions	Responsibility
Command	
Incident commander	This is the only position that is always activated. The incident commander • is responsible for incident management. • directs all activities within the HCC. • devises strategies and priorities to address objectives of the IAP.
PIO	The PIO coordinates information sharing inside (internal stakeholders) and outside (external stakeholders) the hospital, including with the media or other organizations.
Liaison officer	The liaison officer is responsible for liaising/networking with external agencies assigned to support the hospital during an incident response.
Safety officer	The safety officer: • monitors hospital response operations to check for correct and unsafe practices. • establishes measures to assure the safety of all team members.
Medical-technical specialist	These people are experts in areas like infectious disease, legal affairs, risk management, medical ethics etc. who may be asked to provide HIMT staff with recommendations or information. They may be assigned anywhere in the HICS structure based on requirement.

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8   EMSA, HICS Guidebook, https://emsa.ca.gov/wp-content/uploads/sites/71/2017/09/HICS_Guidebook_2014_11.pdf

Function and Positions	Responsibility
Operations	
Function chief Team/unit lead for every separate function/position	The team manages all operational activities and implements the IAP. This is the largest section involving multiple positions, such as (a) staging, (b) medical care, (c) security, (d) hazmat (e) infrastructure, (f) business continuity and (g) patient–family assistance, that are responsible for the management and coordination of resources needed to respond to the incident. Position activation depends on (1) situational needs and (2) the availability of qualified staff.
Planning	
• Function chief • Unit lead for every separate function/ position	The function chief • collects, evaluates and disseminates situational information about incident operations and resources assigned. • conducts planning meetings. • prepares an IAP for each operational period. • provides all information needed for critical strategic decision-making done by the incident commander and other functional positions within the hospital incident management team. There are four principal units in the planning section, each of which is directed by a unit leader: (1) resources, i.e., personnel and material tracking, (2) situation, i.e., patient and bed tracking, (3) documentation and (4) demobilization.
Logistics	
• Function chief • Unit lead for every separate function/ position	The function chief provides support during the incident, such as acquiring resources from internal and external sources. The logistics section can be subdivided into two branches based on the situational needs: (1) the service branch, which includes (a) communications unit, (b) information technology/information services/equipment unit and (c) food services unit, and (2) the support branch, which includes (a) supply unit, (b) transportation unit, (c) labor pool unit, (d) employee health and well-being unit and (e) employee family care unit.

Function and Positions	Responsibility
Finance and Administration	
• Function chief • Unit lead for every separate function/ position	The finance/administration section comprises four units: (1) time unit, which accounts for personnel time, (2) procurement unit, which orders items and initiates contracts, (3) compensation/claims unit, which arranges personnel related payments and workers' compensation and (4) cost unit, which tracks response and recovery costs and the payment of invoices.

Other Relevant HIRS Dos

Acknowledge the unity of command: A HIMT member, during their HIRS assignment, should report only to one supervisor. They should not be expected to simultaneously perform their normal job duties as this would violate the unity of command. Thus, when a HIMT member takes up this role, the regular senior should be informed.

Giver HIMT members an identifier/uniform: All team members should wear an identifier/uniform such as a vest or jacket that will help them stand out and make others aware that they are part of the HIMT. Their position should also be mentioned on the garment. Color codes can be beneficial. For example, a person from the command team could be assigned a white jacket. These uniforms should be readily available to them, in their own drawers or cupboards, otherwise they would not be easy to locate when a disaster suddenly strikes. Indeed, their entire kit can be kept along with this uniform.

Assign backup HIMT members: There should be at least one additional staff member trained for each HIMT position to ensure the continuity of operations if a disaster is prolonged, and to avoid HIMT members from getting exhausted or overwhelmed. Also, with shift rotations, one HIMT member should be in the hospital at all times.

Keep JAS and other required forms handy: All JAS and other HIRS forms should be available for use in every operational period. These should be collected by members of the planning section when the incident is over so that they can be added to the incident file.

Involve all departments and their leaders: The EOP should acknowledge the role of each department in the various scenarios identified in the HVA, and the departmental head should be mentioned in the EOP. Moreover, every department should be provided the equipment and supplies necessary to respond to internal emergencies. These include, but are not limited to, personal protective equipment (PPE), evacuation stretchers, flashlights, and drinking water. These supplies should be kept in a place that is easily accessible. Deployment of the supplies should be smartly managed so that they get replenished during the demobilization phase.

10. Activating the HIRS

10.1 Trainers' Notes

A hospital has to be ready to activate the HIRS the moment it receives warning from any source about an impending incident. Even if there is no prior warning and a disaster suddenly occurs, activation has to take place immediately.

10.1.1 Process of Activating the HIRS

The steps that need to be taken during the activation phase are as follows (EMSA, 2014):

Alerts and Notification

Most often, hospitals are caught off guard. This is especially the case when an unpredictable event like a terror strike or an earthquake occurs. However, for some types of hazards like cyclones and floods, advance warnings may be available through the central/state governments, law enforcement agencies or the meteorological department. Notifications can be of the following three types:

- Advisory, which indicates that there is the potential need for a response but it is not immediately required.

- Alert, which indicates that there is a need for readiness since an incident is likely or imminent.

- Activation, which indicates that a response is required.

During this phase, it is important for hospital staff to gather information about the incident, communicate with each other, collect protective equipment and prepare themselves for action.

Situation Assessment, Reporting and Monitoring

The SDMA, concerned state government departments and other allied agencies may provide incident reports via phone or the internet. If patients start arriving at the hospital, they may also be sources of first-hand information. During this step, the bi-directional sharing of situational information between the hospital and other response agencies is crucial.

Activation of EOP and HIRS

Based on situational requirements, partial or full activation of the EOP and HCC may be necessary. The HCC is a room or place that acts like a hub for all incident response activities. Staff requirements have to be calculated and arranged accordingly, especially in the case of a mass casualty event. Simultaneously, the emergency and other relevant departments have to be prepared for action.

Every hospital, small or large, has a point beyond which its capacity to impart proper care to existing and incoming patients will be exceeded. Thus, the EOP should be activated in anticipation of such an occurrence.

The incident commander can take charge (based on a decision of the HIMT) and activate the HCC so that required members of the HIMT can report to, and work in close coordination with, it. Similarly, it is a good idea to activate the HIRS if the incident seems large s ale. The incident commander can take stock of the situation and determine the appropriate objectives and priorities. Based on this analysis and in accordance with the EOP, additional command and general staff can be deployed, based on need, to assume HIMT positions. It is quite possible that all the appointed people may not be available at the given time – some may be off duty, while others may be on leave. In such a case, the staff available in the hospital may have to fill positions till the other staff members arrive. In smaller, private or government hospitals – primary healthcare PHCs or CHCs – in rural or urban settings, where the staff strength is small, some individuals may have to simultaneously perform several roles under the guidance of the incident commander.

Building the HIRS Structure

All the hospital staff should be trained in DM. The HCC should maintain a list of all staff members who are trained/qualified to take on HIMT positions when the need arises. There should also be sufficient backup staff. When the HIMT positions are activated, there should be clear documentation of which staff took on which role during the incident response. The leadership/management of the hospital should also be kept in the loop during the entire process.

Establishing the Hospital Command Center

The HCC is crucial for the HIMT to function effectively. The incident commander can conduct all coordination activities from this location. Indeed, the effectiveness of the HIMT is greatly enhanced when members have access to an HCC. Some points to be kept in mind while identifying a location for the HCC are as follows:

Accessibility: It should be easy to approach from every part of the hospital at all times but not be in a crowded area.

Space and flexibility: The HCC should have enough space for equipment, furniture, supplies and technology to accommodate the HIMT. Further, HIMT team members should have adequate space at the center to work and keep their tools and JAS.

Survivability and sustainability: The location should be able to sustain its emergency functions and even survive the effects of a hazard. Thus, emergency power, lighting and computer and communication systems should be available at the HCC.

Security: Only authorized persons should have access to the HCC.

Communication systems: It is crucial for the HIMT to be in constant touch with

internal stakeholders of various departments as well as external response agencies. Communication systems can include (a) voice systems like land, mobile and satellite telephones and two-way radio systems, (b) data systems like computers with internet connectivity, (c) equipment for receiving public broadcasts like a television, (d) equipment for the visual display of incident information such as projection screens, maps etc. and

(e) miscellaneous office supplies. All items must be checked regularly to ensure that they are functional, and replaced if necessary.

It may be noted that all of these conditions may not be fulfilled in every hospital, especially in small, rural or remotely located ones which lack adequate resources. However, hospitals should attempt to fulfill as many requirements as possible to ensure at least a basic, functional HCC. Finally, in addition to backups for staff members, equipment and systems, the HCC itself should have a backup site available just in case it becomes non-functional or inaccessible during an incident. If space in the main hospital building is unavailable, an external site close by may be used. At large hospitals which have adequate resources, all the required systems and equipment can be stored in huge roller boxes or bags that may be transported to the alternate HCC site. Indeed, hospitals with this capacity should conduct mock drills to familiarize themselves with shifting to an alternative HCC site should the need arise.

Incident Action Planning

This is an important step in the HIRS. The IAP may well be the most significant document produced during response operations. A hospital's IAP details the hospital's incident objectives, anticipated hurdles and resources required during the operational period, i.e., it works on the principle of management by objectives (MBO). Meetings are an important part of any plan and its implementation; the three types of meetings that are crucial in the context of an IAP are shown in Figure 10.1.

Figure 10-1: Three Types of Meetings for Incident Action Planning

Incident Action Planning Meetings by Command and General Section Staff

PLANNING MEETING:
Response objectives, hurdles strategies, tactics, and response assignments identified

OPERATIONS BRIEFINGS:
Information about the actions/operations to take place is conveyed to the hospital HIMT members involved in the incident response, queries are resolved

COMMAND AND GENERAL STAFF MEETINGS:
To reassess and revise the objectives and actions if required, during the operational period

As a whole, the incident action planning process includes

- Activating the EOP of the hospital and implementing the HIRS

- Collecting and verifying all the information relating to the incident, checking the status of hospital systems and verifying the capacity of the hospital for response operations

- Identifying the incident objectives and establishing priorities

- Ensuring that all incident objectives are SMART: specific, measurable, action oriented, realistic and time sensitive

- Allotting HIMT positions based on the availability and qualifications of personnel.

- Developing the action plan and strategies to be adopted

- Calculating the resource requirements based on ongoing situational assessments

- Initiating the required community alerts and notifications

- Launching communications and response links with the relevant community response partners

Communication and Coordination

Communication and coordination activities occur on two levels: internal and external.

Internal: This refers to communication and coordination between various departments of the hospital. It can be achieved using any of the following mediums, based on availability – phone, intranet/internet, video conferencing, email, circulating hard copies of documents and even physical meetings.

Hospitals that are part of a larger chain of hospitals must keep their corporate offices updated. Keeping patients and visitors properly informed is another important communication requirement. This is the job of the PIO.

External: During disasters, communicating with a number of external response partners becomes necessary. For instance, if there is any internal incident such as fire or chemical spill, the fire department, police and SDMA have to be informed immediately. This is the responsibility of the liaison officer. The liaison officer, who is at the HCC, should be given the administrative assistance required to ensure that communication between response partners flows accurately and in a timely and effective manner.

Staff Health and Safety

This aspect, along with patient safety, should be a prime concern throughout response operations; it is the responsibility of the safety officer. Staff members who get ill or injured should be cared for immediately (through the logistics section's employee health and well-being unit). Compensation and claims issues should be settled by the compensation and claims unit lead in the finance and administration section.

In the case of chemical, biological or radiation incidents, when chances of exposure are high, staff should be provided with, and trained to wear as well as dispose of, PPE. Staff

should also be monitored for signs of illness, injury and fatigue. In such cases, proper personnel and equipment decontamination, disinfection and disposal are also crucial to prevent chances of cross-contamination. Similarly, for staff working with patients suffering from infectious diseases such as COVID-19, psychosocial assistance should be available, especially for those who are overworked and showing signs of distress or anxiety.

Extended Operations

In times of disaster, hospital teams may be required to work for extended periods, especially when there is a surge in patients or when a hospital has to be evacuated. For events like these, the planning section can ensure that staff members have reasonable work schedules with periodic days off. If the hospital is large and has a huge staff strength, more than one HIMT can be created so that members can work rotating schedules, thus minimizing work stress levels.

Legal and Ethical Dilemma

While handling a disaster, hospitals may face legal or ethical dilemmas which may need to be addressed. This may be more so in large urban hospitals, and less in small rural ones, where the population is smaller or scattered. For instance, a surge in patient volume that exceeds the available resources in a hospital could result in having to make a choice about who should be saved first (triage) and whether they should focus on saving the masses or catering to individual patients. Similarly, investigative medication procedures that Doctors normally follow may need to be modified or done away with in some cases. To ensure that all legal and ethical questions are addressed, the HDMC should consider including the hospital's legal department, medical ethicist and risk management team to provide guidance on these issues.

Demobilization

The final decision to change from response to demobilization phase is made by the incident commander. However, planning for this change should begin early in the response phase; the demobilization unit lead from the planning section is responsible for planning and implementing the shift. Based on the needs of the situation, areas of the hospital may need to demobilize at different times. When the decision to demobilize has been made, the planning section (chief or demobilization unit lead) should communicate this to the hospital staff and the liaison officer must inform the concerned external agencies (fire, police, NDRF, SDMA etc.). If the information has to be shared with the media or general public, the PIO can take on this responsibility.

Recovery

In this phase, the hospital recommences its usual functioning. The speed at which normal operations resume may vary between hospitals depending on their size, location, resources at their disposal, the intensity of the incident experienced, the surge of patients, the amount of damage incurred and many other factors. During this phase, many tasks have to be undertaken; some important ones are listed as follows:

1. Equipment, supplies and medications should be brought back to pre-incident inventory levels as soon as possible.

2. As part of staff health and safety concerns, those personnel who are still experiencing stress, anxiety or depression as a result of the incident must be provided psychosocial support.

3. Personnel who used PPE during the response should complete medical surveillance forms that then become a part of their employee health records. Moreover, they should constantly monitor themselves for signs and symptoms of disease.

4. This is also the time for insurance settlements of patients and claim settlements, if any, of the staff. The finance and administration section's compensation and claims unit needs to take care of these activities.

5. Any additional staff or volunteers who were roped into the incident response should be given some form of appreciation. This could be in the form of a certificate, letter of appreciation or souvenir that they can keep.

6. Similarly, hospital staff members who were involved in the incident response should be offered some form of recognition and appreciation. This would boost their motivation, commitment the job and self-worth.

7. Any physical damage to the hospital building needs attention at this time.

8. This is also the when the finance and administration section has to track all the costs associated with the response, including those for personnel, patient care, resources, equipment repair and replacement, and hospital repair and operations. These may need to be conveyed to the corporate office, for appropriate reimbursements, if the hospital is part of a chain, or to the health department, in the case of a government hospital.

Response Evaluation and Organizational Learning

Every incident and its management offer a plethora of opportunities for learning. Thus, throughout the response period and soon after demobilization, the incident commander and HIMT should keep track of what went well and what could have gone better. These should be shared by all the staff involved in the incident response during debriefing meetings after the recovery phase. These valuable observations and suggestions should be recorded for future incidents in an after-action report (AAR).

11. Culture of Safety and Psychological Safety

"An incident is just the tip of the iceberg, a sign of a
much larger problem below the surface."

– Don Brown, Owner and Director of Software Products and Services for BasicSafe

11.1 Trainers' Notes

11.1.1 Understanding the Culture of Safety in a Hospital or Healthcare Setting

A hospital, or any other organization, for that matter, may have good systems, processes and policies in place for enhancing work performance and productivity. But does this guarantee the growth and success of the organization? Not necessarily, and especially not if the implementation of these systems is weak or if the organization lacks a human touch or feels unsafe. As Stephen Covey (1989) puts it, "If you put good people in bad systems, you get bad results. You have to water the flowers you want to grow."[9]

Similarly, in the context of Hospital Safety, a comprehensive HDMP is of no use if the hospital does not value and instill a Culture of Safety in its staff. But when safety is prioritized, everything else falls into place. So, what exactly is a Culture of Safety?

A Culture of Safety describes the core values and behaviors that are created through collective and continuous commitment of organizational leadership, managers and healthcare workers to emphasize safety over competing goals (ANA, 2016). The concept of safety culture comes from studies of HROs, which consistently minimize the effects of antagonistic events despite carrying out inherently complex and hazardous work. They can do so because they prioritize and maintain a commitment to safety at all levels of the staff, from frontline workers to managers and executives. This establishes a Culture of Safety.

11.1.2 Factors Essential for a Culture of Safety in Hospitals

In the context of hospitals and other healthcare settings, the concept of Culture of Safety is becoming increasingly popular and significant. This is because of the humongous economic, health and social costs associated with hospitals and the sensitive nature of the work that they are involved in, as discussed in earlier modules. Hospitals cannot afford to be unsafe; they must function like HROs. Key variables of HROs which facilitate a Culture of Safety in a hospital are as follows (AHRQ, 2019):

- Acknowledging the high-risk nature of the work and having the determination to achieve consistently safe operations. This makes hospitals reliable.

- Fostering a blame-free environment. No one shirks their responsibilities, and individuals report errors or near misses without fear of rebuke or punishment. This facilitates Psychological Safety.

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9   Stephen R. Covey. 1989. The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change. Free Press publishing. ISBN   0-7432-6951-9

- The hospital should allocate resources to to address hospital and patient safety concerns. By doing so, it can be made more resilient.

To enforce these factors, committed and proactive leadership is crucial. Such leadership encourages collaboration and teamwork across ranks and disciplines to find solutions to problems of safety.

To summarize, a hospital has a Culture of Safety if the leadership fosters these qualities:

a) High reliability

b) Resilience

c) Psychological Safety

To create a Culture of Safety, a multi-stakeholder approach must be implemented. Staff at every level should understand the significance of a Culture of Safety. Ensuring capacity, commitment and communication at all levels is the only way to make a hospital highly resilient and turn it into an HRO. Once this is achieved, a Culture of Safety is bound to prevail.

This module discusses Psychological Safety. HROs and resilience are discussed in separate ones.

11.1.3 Assessment of Safety Culture and Hospital Safety

The Hospital Safety and Health Management System Self-Assessment Questionnaire is a simple inventory that hospital stakeholders can use to assess a hospital's implementation of the key activities necessary for a safety and health management system. This tool was developed by the Occupational Safety and Health Administration, United States Department of Labor. While it does not comprehensively analyze the structural, non-structural and functional elements of Hospital Safety, it covers aspects related to safety culture and leadership.

The questionnaire contains 53 questions in 6 sections as follows:

- Management leadership (8 questions)

- Employee participation (11 questions)

- Hazard identification (10 questions)

- Hazard prevention and control (8 questions)

- Education and training (10 questions)

- Program evaluation and improvement (6 questions)

Both, the Hospital Safety Index (discussed in the Hospital Safety Assessment module) and the Hospital Safety and Health Management System Self-Assessment Questionnaire, can be combined and adapted to offer a holistic perspective on Hospital Safety.

11.1.4 Psychological Safety

Psychological Safety refers to a person's ability to "show and employ oneself without fear of negative consequences of self-image, status or career" (Kahn 1990, p 708). It is an enabling condition for teams. This is because in psychologically safe teams, members are not afraid of expressing themselves; instead, they feel accepted and respected.

In the context of Hospital Safety, this kind of environment is of utmost importance. Often, staff members may notice a disaster that is waiting to happen in the form of an unsafe hospital building structure, a violation of safety norms in the hospital, loose electrical circuits, a lack of fire equipment and so on. Similarly, concerning patient safety, a nurse may realize that a patient has not been prescribed the right dose of medicine by a senior Doctor. However, these frontline workers may be scared to voice their concerns if they perceive that the Doctors or leadership will ignore them or not appreciate their being vocal or critical (Detert & Edmondson, 2011). Not mentioning such dangers may in the long run have disastrous consequences, all because the staff lack Psychological Safety.

11.1.5 Benefits of Psychological Safety

If hospital team members feel psychologically safe, the hospital benefits in the following ways:

• Motivation and engagement of staff are enhanced (Nembhard & Edmondson, 2006). This is because they feel they have a voice and are respected, which can enhance their feelings of self-esteem and worth.

• Innovations, including those to processes, are fostered (Baer & Frese, 2003). This is because team members are happy to share their ideas with one another.

• The chances of learning from mistakes are improved (Edmondson, 1996), perhaps because people are not scared of making mistakes. They are ready to take risks, which in turn fosters innovation.

11.1.6 Factors Influencing Psychological Safety

Some people are fearless and outspoken. They may not hesitate to voice their concerns. However, not all people can do that. For some others, leadership and team characteristics foster Psychological Safety.

Leadership aspects: Two features of leadership have been known to be instrumental in creating a psychologically safe team: participatory management (Edmondson, 1999) and inclusive management (Nembhard & Edmondson, 2006).

Team aspects: Two features of a team have been known to be instrumental in creating a psychologically safe team: a clear team structure where the team members recognize their role in the team (Bunderson & Boumgarden, 2009) and teams where members have very good, robust and cohesive bonds (Schulte, Cohen, & Klein, 2010)

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11.1.7 Fostering Psychological Safety: The Role of Leadership

Small but steady steps that the leadership take can go a long way in fostering Psychological Safety among hospital staff. A few steps, outlined here, enhance Psychological Safety in work environments such as a hospital, where both, the complexities of systems and interdependencies between staff, are high.

Leading by example and acknowledge your fallibility: The leadership team and departmental heads can lead by example. They should be open to receiving feedback from other staff members. Sharing feedback could be done through meetings or even suggestion boxes. Leaders should be approachable and open to hearing opinions that do not match theirs; they should accept their mistakes rather than getting defensive. In this way they will become good role models.

Getting more involved: Leaders should not be aloof; they should be involved and present to staff members at all levels. They can do this by actively listening to the concerns of the staff, asking them questions, attempting to understand their issues better and acting on relevant issues that need to be addressed.

Setting ground rules to create a safe environment: The hospital management should set norms that are displayed on notice boards and reiterated during training sessions. Some of the norms could be to (a) actively and openly listen to a colleague's ideas, feedback and suggestions without interrupting, (b) be non-judgmental and accepting, (c) use feedback to strengthen processes and systems, and (d) take responsibility for one's own actions.

Note: All these concepts can be explained and discussed using a case study.

There are multiple case studies available to illustrate the role of Leaders during crisis situations. Lessons can be drawn from these cases to highlight specific aspects of leadership as and when desired by the Trainer. We are providing the link of 2 such case studies from Harvard Business School repository:

1. https://hbsp.harvard.edu/product/SMR398-PDF-ENG?Ntt=leading%20during%20crisis

2. https://hbsp.harvard.edu/product/422057-PDF-ENG?Ntt=leading%20during%20crisis

12. Culture of Safety and HROs

12.1 Trainers' Notes

The previous module discussed the concepts of Culture of Safety and Psychological Safety, which are two important components of HROs. So what exactly are High Reliability Organizations (HROs)? How is a Culture of Safety and Psychological Safety important to them? This module will elaborate on these questions.

12.1.1 Understanding HROs

HROs function in complex environments where accidents might be expected to occur frequently, and with disastrous consequences. Still, HROs manage to ward them off. In other words, they have high safety records with nearly error-free performance. Aircraft carriers, electrical power grids, military organizations and space agencies are examples of HROs (Christianson, Sutcliffe, Miller, & Iwashyna, 2011). Recent definitions of HROs have focused on the extent to which organizations constantly seek to improve their reliability. This involves not only preventing errors or failures, but also recovering quickly if they occur (Withen, 2007).

The way HROs function can seem counterintuitive. For instance, they do not try to hide failures; instead, they constantly try to find faults and loopholes. They perceive faults as windows into the health of the system. Further, they anticipate unexpected events and develop the capability to manage them.

12.1.2 Development of HROs

Entities do not just 'become' HROs. They need to work on it continuously (Roe et al, 2005). Proactive leadership, a shared vision throughout the organization (Edmonson et al, 2008), a supportive learning environment, collaborative learning processes (Nasiatka, 2008; Zohar and Luria, 2003) and a Culture of Safety are essential to the process.

To become an HRO, the organization needs to pay attention to developing systems, culture and cognition (The Health Foundation, 2011). To develop systems, procedures need to be in place to support the reporting of near misses and even small and localized failures. Risk-profiling is needed to understand what is important and what are the lessons learned. Investigation and causal analysis and reward and recognition are the other important features. In terms of culture, organizations need to set up strategies to ensure a just culture, a reporting culture and a learning culture by emphasizing leadership, organizational learning and engagement. In terms of cognition, it is important to foster increased situational awareness and mindfulness. This is because mental models influence reasoning and decision making and encourage systems thinking.

The development of institutional mechanisms such as partnerships within and between sectors and departments and even with academia for learning collaborations are beneficial for developing high reliability (Saleh et al, 2010).

12.1.3 Key Characteristics of HROs

Case studies and qualitative research suggest the following key characteristics of HROs (The Health Foundation, 2011):

1. They have very complex high-risk environments. These could include physical as well as social and political environments.

2. The consequences of errors in these organizations are very serious.

3. They have a positive safety culture with leadership and Frontline Staff taking shared responsibility. All members respect team work.

4. They develop creative ways to cope with and minimize errors.

5. They use complex processes to manage technologies and work.

6. They often include a variety of checks, counter-checks and rest-periods as a precaution against potential mistakes.

7. They are flexible while dealing with change.

8. They strive for continuous improvement through regular audits of processes and by implementing changes.

9. Such organizations emphasize the learning culture and believe in ongoing training of team members.

10. The staff of such organizations are highly trained and well-rewarded.

Further, there are five key principles that facilitate problem detection and problem management (Weick etc. al, 1999) and these are:

a. **Preoccupation with failure**: Using failures or problems to gain insight into the strengths and weaknesses of the system.

b. **Reluctance to simplify**: Avoiding the tendency to minimize or justify problems.

c. **Sensitivity to operations**: Being aware of the 'big picture' and the interdependence of functions and systems. Realizing how problems in one area can spread to other areas.

d. **Resilience**: Developing the capability to cope with unexpected events.

e. **Respect to expertise**: Identifying experts in the organization and ensuring that they are in charge of decision-making.

By applying these principles consistently, HROs continually build a binding safety culture. However, the process and practices used to do so may differ among HROs (Schulman, 1993). It is due to their safety culture that HROs can function safely despite the hazards of complex systems (Tamuz and Harrison, 2006).

12.1.4 Hospitals as HROs

Healthcare facilities, and more specifically hospitals, can be considered as HRO's since patient care also involves complex and ambiguous tasks in a fast-paced environment.

Moreover, the work can be highly hazardous, not only due to certain inherent features of hospitals, but also because patients' lives are involved. There is also an interdependence between the different departments/functions, stakeholders and critical systems, due to which errors can have potentially catastrophic consequences.

As in the case of other HROs, hospitals must involve all stakeholders in making crucial decisions related to patient safety as well as Hospital Safety, and not only the top management or leadership. This is because Frontline Workers and Doctors are best equipped to understand matters related to patient safety and the nuances of the structural, non-structural and functional weaknesses of the hospital.

The necessary ingredients for developing and sustaining a system of safe, highly reliable care in healthcare settings are strong effective leadership, a Culture of Safety and an accessible learning system. Figure 12.1 shows a framework developed by Frankel et al. (2017), explaining the aspects hospitals need to work on to become HROs. It also explains how the characteristics of HROs fit into the three categories of leadership, culture and learning system.

Figure 12-1:Model for the Framework for Safe & Reliable Care
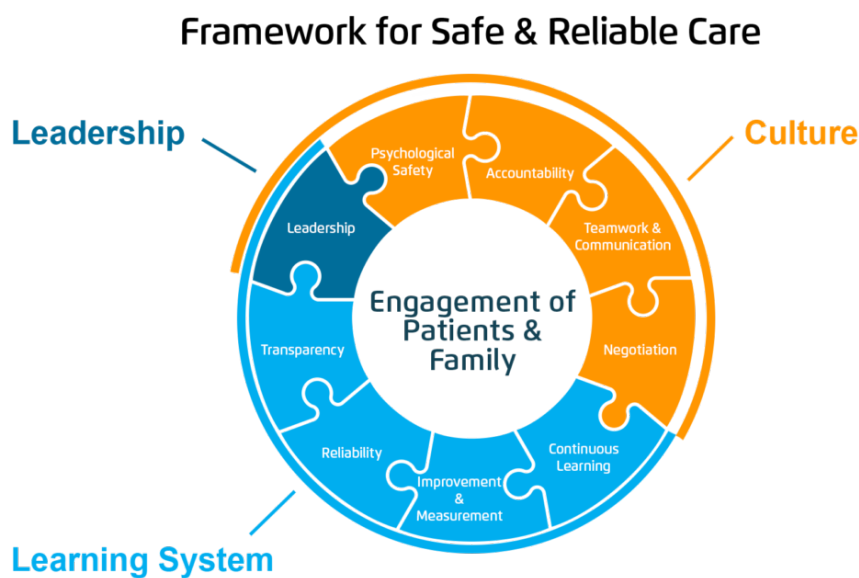
Based on https://www.safeandreliablecare.com/blog/2016/11/29/s-r-sociotechnical-framework-ihi-minicourse

Source: Frankel A, Haraden C, Federico F, Lenoci-Edwards J. (2017): "A Framework for Safe, Reliable, and Effective Care." White Paper. Cambridge, MA: Institute for Healthcare Improvement and Safe and Reliable Healthcare.

In order to achieve high reliability, a hospital must pay attention to all aspects of the framework; otherwise, the improvement will not be sustainable. Frankel et al. (2017), through years of research in the area, have also shed light on the type of culture that an organization needs to become an HRO through the cultural maturity model.

Figure 12-2: Safe and Reliable Culture Maturity Model
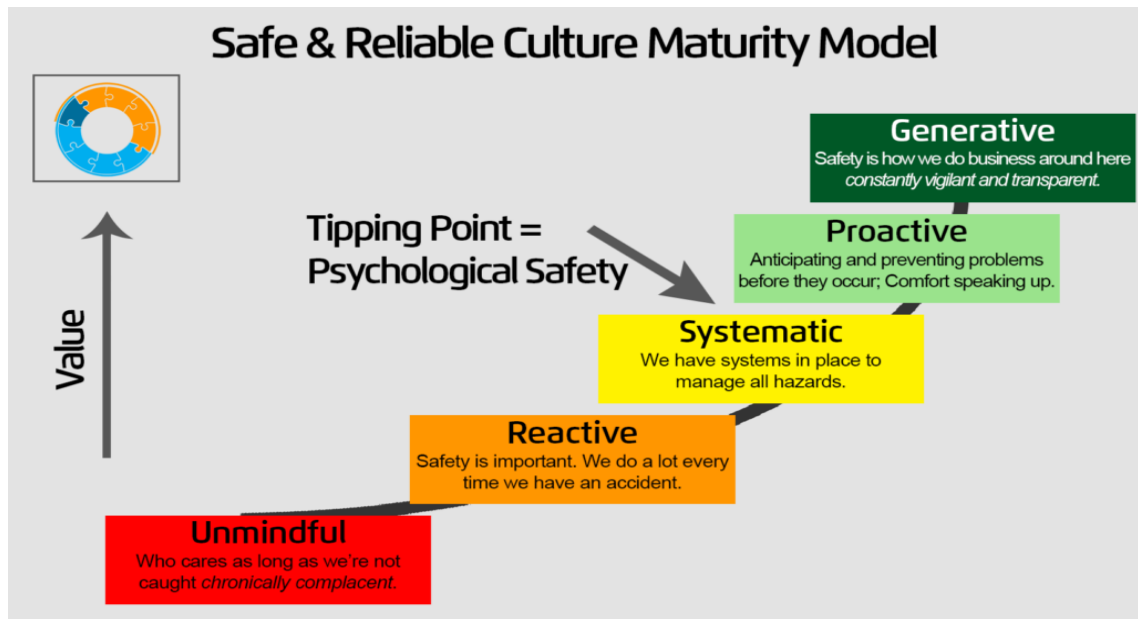
Source: Frankel A, Haraden C, Federico F, Lenoci-Edwards J. (2017) A Framework for Safe, Reliable, and Effective Care. White Paper. Cambridge, MA: Institute for Healthcare Improvement and Safe and Reliable Healthcare.

In a hospital or healthcare setup, all components of the framework, from leadership to learning, can be rated on the cultural maturity scale shown in Figure 12.2. The tipping point for Psychological Safety is when an organization shifts from a systematic approach to managing hazards to a proactive one in which staff anticipate and prevent problems before they occur. As discussed in the previous module, Psychological Safety ensures that employees are not scared to report problems. The peak of cultural maturity is a generative culture in which safety is highly valued and the organization is constantly vigilant and transparent. This is very similar to the approach adopted in DM today – a proactive and preventive approach rather than reactive one, i.e., working only when a disaster strikes. When people simply react to a problem, they tend to make mistakes because they are distracted and need to multitask, causing them to forget things. In a hospital setup, distracted caregiving can have unintended negative consequences, especially in times of emergencies and disasters.

12.1.5 Leadership and Cultural Maturity

The cultural maturity model sheds light on the role of Leaders in different levels of cultural maturity (refer Figure 12.3). It is often said that an organization is only as strong as its Leaders. Therefore, it is important that Leaders set the right culture for the organization. In an unmindful culture, Leaders are practically absent and they do not engage with Doctors and Nurses. In cultures that are proactive and generative, Leaders are visible, talk to staff, and listen to and support them. Such Leaders are also open to learning and, thus, there is Psychological Safety. Organizations benefit significantly from a generative culture, where Leaders encourage the cyclic flow of information that pushes feedback and cross-organizational learning.

To conclude, healthcare provision is a complex activity. The cultural maturity model indicates that a hospital can improve its quality if all its stakeholders work proactively as a team rather than unmindfully or reactively. The Leader plays a crucial role in influencing culture.

Moving towards proactivity is also not easy. It requires all stakeholders, young and old, junior and senior, and from different roles, responsibilities and abilities to come together, think ahead, and play as a team. It is only when this happens that juniors can learn from their seniors and over the years learn to deliver excellent care, eventually becoming experts themselves.

Box 12.1: Airlines as HROs

Airlines are HROs whose reputations depend on several measures, including their timely performance, passenger safety, completion rates, reductions in mishandled or lost luggage and complaints and high quality customer service.

Let's compare this with hospital settings. A hospital also gains and maintains its reputation through on-time treatment of patients, patient safety, completion of successful treatments and surgeries, reduced rate of badly handled cases and complaints, and approachable nurses and doctors. So, isn't high reliability crucial here too? Let's go back to the airline's scenario. The number of flights per day for any good airline runs into hundreds if not more, and yet, there is consistency and reliability in their performance. Any lack of vigilance on part of the pilot can lead to air crashes, costing the lives of hundreds of passengers and crew members. Any slackness in the working of the crew can also put passengers in danger. That does not happen, because on the flight, the crew and pilots work like a team to ensure the safety and comfort of the passengers. In the airport control rooms, the air traffic controllers work in coordination with the pilots to ensure the same. Even the staff responsible for cleaning the aircrafts, refuelling them, inspecting the various parts like the engine, fuselage, tyres, tail, wings etc. and loading the luggage onto the aircraft work seamlessly in coordination to ensure close to zero errors occur. Why? Because

safety is their culture. In turn, the smooth running of the airline enhances customer perception, satisfaction, and loyalty. Fewer operational problems also imply better cost efficiency and overall financials for the airline.

Put on your thinking cap and let's try and draw similarities and differences between the airlines and hospital scenarios in the context of Culture of Safety and reliability.
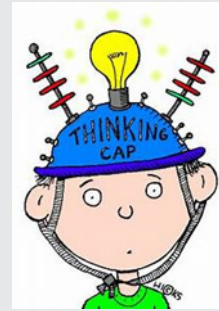
13. Culture of Safety and Resilience

13.1 Trainers' Notes

In the previous module, we discussed that Culture of Safety as well as resilience are important aspects of HROs. A Culture of Safety encompasses different aspects of safety – from patient safety to Hospital Safety, especially in times of disaster, and even staff safety. Patient safety is the ultimate goal for hospitals. Culture of Safety, including Psychological Safety, has been discussed at some length in the previous two modules. This module focuses on resilience and how a Culture of Safety also fosters resilience. This is discussed with reference to staff resilience and hospital resilience to disasters.

13.1.1 Resilience

Resilience is defined as the capacity to adapt to unexpected challenges and the flexibility to revert to normality. In simple words, it is the ability to recover quickly from difficulties.

Figure 13-1: A Resilient Nurse

Staff Resilience

A Culture of Safety in any organization, including hospitals, has been found to reduce burnout rates and encourage resilience. Going back to the cultural maturity model (Frankel et al, 2017) discussed in the previous module, as the culture becomes more proactive and generative, staff resilience increases and burnout decreases (Figure 13.1).

Prevention of burnout: In the 11th Revision of the International Classification of Diseases (ICD-11), WHO describes "burnout" as an occupational phenomenon. The ICD-11 (WHO, 2019) states that "Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: (1) feelings of energy depletion or exhaustion (Figure 13.2; (2)

Figure 13-2:Burnout!

increased mental distance from one's job, or feelings of negativity or cynicism related to one's job; and (3) reduced professional efficacy." Prevention of burnout is very important in hospitals and healthcare setups, since burnout among Frontline Staff and Doctors can increase the probability of errors, infections, and mortality, and consequently, reduce patient satisfaction. Burnout also causes staff turnover due to loss of interest or satisfaction with one's job.

Psychological Safety and respect: When frontline care providers feel they are heard and supported, it enhances staff resilience, because they feel valued and supported and they believe that they have the resources they need to do their jobs. On the other hand, when they do not feel safe and empowered, they do not comfortable sharing feedback if they notice something in the hospital is not quite right.

Accountability: Accountability is another significant aspect that enhances staff resilience because it creates a work environment that is just and fair.

Figure 13-3: Fighting Challenges as a Team!

Team-work and social support: Closely knit teams provide social support to each other (Figure 13.3). Thus, it is healthy for hospital staff to develop personal as well as professional networks, which can be a source of comfort, support and guidance, especially in times of stress and even in crisis situations (Jackson et al, 2007**).**

Effective communication: When workplace connections are characterized by effective communication, wherein every individual proactively listens to their colleagues and is responsive to their thoughts, concerns and emotions, they facilitate staff resilience. This feature is embedded in cultures that foster safety. In such setups, even conflicts and negotiations do not end badly. Consequently, the staff is able to come out of difficult and even disastrous situations in a positive manner.

Figure 13-4: A Resilient Person

Personality characteristics: Some personality characteristics that are linked to resilience are – hardiness, positivity, emotional intelligence and heightened spirituality (Jackson et al, 2007**)**. It would be beneficial for hospital leadership to keep this in mind while hiring staff (refer Figure 13.4).
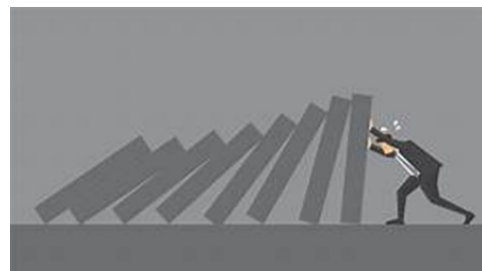
How Can Staff Resilience be Developed?

Staff resilience can be enhanced in a few ways (Craig, 2020):

1. **Building a Culture of Safety:** Based on the discussions in this and the previous two modules, it is clear that a Culture of Safety and Psychological Safety are facilitators of staff resilience.

2. **Training:** Resilience is a dynamic concept on which staff can be trained. They can be taught the ways in which it can be inculcated, such as through improving communications and teamwork, building social support, enhancing emotional intelligence, etc.

3. **Developing SOPs and guidelines:** SOPs and guidelines are meant to provide direction about what has to be done, how and by whom. These documents help in removing uncertainty and thus reduce work stress. Not knowing what to do and how to do it can often be a source of stress for hospital staff.

4. **Debriefing sessions:** Hospitals often face challenging and stressful situations while handling emergencies and crisis situations. It would be useful for senior management to organize "post-challenge" debriefing sessions for hospital teams. Such sessions encourage reflection about the experience through team discussions. This can help in understanding how everyone coped with the situation and what could be done better.

13.1.2 Hospital Resilience to Disasters

Hospitals face challenging situations during mass casualty events, crises and internal and external disaster incidents. Hospital disaster resilience encompasses a hospital's ability to withstand, absorb, and respond to disasters (refer Figure 13.5) while maintaining critical functions, and then recovering to its original state or adapting to a new

Figure 13-5: A Structure Resilient to Disaster

one in the post-disaster phase. It also involves learning from the situation to ensure better preparedness for future challenges (Braun et al, 2006; Paturas et al, 2010). Understanding the level of a hospital's disaster resilience is the first step in planning to enhance the effectiveness of emergency response services (Zhong et al, 2014). Of course, staff resilience is a very important contributor to one aspect of resource resilience – human resource resilience. The other aspect is infrastructural resilience. It is a prerequisite to developing a hospital design and preparedness plan that can deal with and ensure recovery from all types of emergencies and disasters (Sauer, 2009). To attain resilience, the hospital should use the "PPRR" management strategy of prevention and mitigation (P), preparation and planning (P), response and relief (R), and recovery (R) (Rogers, 2011).

Today, the frequency of natural disasters like earthquakes and floods and man-made disasters like terrorist attacks and technological disasters is on the rise (Cristian, 2018). This trend is visible in India as well as globally. Climate change and the uncontrolled consumption of natural resources by humans have a huge role to play in causing natural disasters. Given the accelerated incidence of these events over the last two decades, the concept of disaster resilience has gained importance (Cristian, 2018).

Healthcare institutions, specifically hospitals, being 'lifeline' services, have a significant role to play in minimizing the impact of disasters on a community and achieving higher community resilience (Paturas, 2010). Hospitals are community assets, and in order to do justice to their role and maximize their integration within a community-wide disaster

response, "safe and resilient" hospitals are required (Albanese, 2008). In fact, the model of "safe and resilient hospitals" was promoted as a key component of disaster risk reduction planning in the healthcare sector during the 2005 World Conference on Disaster Reduction (ISDR, 2005; PAHO, 2005).

As of today, there are several conceptual models that have been developed to explain the different aspects of a resilient organization (Gibson and Tarrant, 2010). All models indicate that there are a number of interdependent factors that need to be considered in the management of risk. There must be a mix of strategies to enhance "hard" and "soft" organizational capabilities. All models also stress that there is no quick fix or single solution, management system or software application that will create resilience. Some of the models suggested by Gibson and Tarrant are briefly discussed below:

1. **The 'principles model of resilience':** This model is derived from common themes that emerge from comparisons of resilience in different disciplines and is based upon six key principles: (1) resilience is an outcome, (2) it is not a static trait, (3) it is not a single trait, (4) it is multidimensional, (5) it exists over a range of conditions and (6) it is based on good risk management.

2. **The 'integrated functions model' of resilience:** This model is based around a robust risk management program. Risk management provides the foundation that links different organizational capabilities such as emergency, business continuity, security and crisis management.

3. **Attributional resilience model:** This model demonstrates what "soft" organizational attributes can help an organization deal with uncertainty and adversity. The organizational values of commitment, trust, strong internal alignment, a common purpose, as well as good leadership are emphasized.

4. **Composite resilience model:** This model considers both soft and hard elements of operation: processes, infrastructure, technology, resources, information and knowledge. This model emphasizes the importance of strategy and policy in establishing the conditions that allow the emergence of a Leader who can rise to the occasion in times of uncertainty.

5. **Herringbone model of resilience:** This model acknowledges that an organization has a range of capabilities and undertakes a range of activities that can contribute towards improved resilience. However, the manner in which they adapt to the non-routine environment determines the level of resilience.

6. **The resilience triangle model:** This model treats (a) process capabilities, (b) resources and infrastructure capabilities; and (c) leadership, people and knowledge capabilities as three sides of a triangle that are essential for organizational resilience. If any one side of the triangle is taken away, it hampers resilience.

To make a hospital safe and resilient, adoption of the resilience triangle model may be most suitable since it is comprehensive and includes the features of the other five models. Research also shows that a DM plan should include safety parameters for structural components, non-structural components, and functional components

(Figure 13.6) such emergency medicine functions (e.g., critical care, surge capacity etc.) and DM mechanisms (e.g., crisis communication, cooperation etc.) (Veterans Health Administration, 2011; Zhong et al, 2014). In addition, it must also address cross-cutting themes such as institutional capacity building, education and training, project implementation, facilitating local and regional cooperation, information sharing, networking and knowledge management, and the provision of subject matter expertise (Albanese et al, 2008). All these parameters, when factored into the Hospital Disaster Management Plan (HDMP), will help in building a Culture of Safety and resilience.

Figure 13-6:A Structurally Resilient Hospital: Good Structural, Non-Structural and Functional Planning

14. The Role of Hospitals in Providing Mental Health Care During Disasters

14.1 Trainers' Notes

14.1.1 Introduction

Figure 14-1:Disaster Scenarios

As part of disaster preparedness, the central and state governments are working towards minimizing loss of life and economic assets when a potential disaster such as a cyclone or flood strikes (Refer Figure 14.1 for some disaster scenarios). Relief activities, which are immediate and short term, are taken up after the disaster to take care of basic needs such as food, water, clothing, shelter and medical facilities for victims. Rehabilitation activities take place on a more medium- to long-term basis and focus on vocational and economic rehabilitation.

14.1.2 Mental Health Consequences of a Disaster

Figure 14-2: Experiencing a Disaster

One area that has long been ignored is the impact of disasters on the mental health and confidence of victims. Most people are left to deal with their traumas and losses on their own. This is especially true in the Indian context due to the stigma attached to mental health. Mental health issues caused by disasters are an even more neglected area. It is only in the last two to three decades that this issue has started gaining recognition as a need that has to be addressed. There is growing recognition of the fact that poor mental health has the power to negatively impact other areas of a person's life, including physical health and professional and social well-being. The cascading effect of mental health problems eventually ruins the very essence of one's "self".

Disasters can cause damage to the psyche in various ways. Following a disaster, many people experience Post Traumatic Stress Disorder (PTSD) and common mental disorders like anxiety, panic attacks or depression. The experience itself may be extremely shocking and traumatizing, and loss of any kind further adds to the trauma (Figure 14.2). For instance, when their property or material goods are lost, victims may find it hard accept that all their life's savings has been destroyed. Loss of loved ones can lead to insecurity

due to the absence of a sense of love and belongingness. People may not know what to do and how to bounce back to normal life again. Disasters like avalanches, landslides and earthquakes can also lead to victims losing parts of their bodies and becoming disabled. Apart from the physical pain, the mental agony linked to such incidences is tremendous; people often cannot reconcile with their fate and can only ask: "Why me?"

Figure 14-3: Grief and Gloom as Aftermath of a Disaster

To summarize, there are various factors that cause psychological vulnerabilities among the victims of a disaster, such as the displacement of the family, death of a loved one, socioeconomic loss, environmental loss, shock, disruption in the family structure, inadequate social support and absence of coping skills (Peek, 2008).

Everyone experiences negative emotions and distress to some extent. The problem lies in the lack of coping mechanisms – some people are able to cope with their trauma within a couple of weeks, but others may not be able to move ahead and overcome their trauma even after a few months. Their cognitions and emotions, and consequently, attitude and behavior, remain disturbed (Figure 14.3). This is why psychosocial and mental health support needs to be a part of their rehabilitation process.

The psychological effects of a sudden or chronic disaster are more extreme among children, women and the dependent elderly population. Thus, they have special needs that require attention (Peek, 2008). The effects may also be different for natural and man-made disasters. For instance, a study of the survivors of the Indian Ocean tsunami in 2004 in India showed a wide range of symptoms related to anxiety, depression and PTSD. Displaced victims reported more severe symptoms than non-displaced victims. Irrational fear and adjustment problems, as well as feelings of hopelessness and constant despair, were also found among the victims (Jenkins and Meltzer, 2012). In the case of man-made disasters, victims may experience different types of emotions. For instance, after the Mumbai riots in 1992–93, while the victims were found to be in a state of fear, shock and helplessness, the psychological and behavioral symptoms observed were anger. Some women who saw the distorted dead bodies of their husbands tried to commit suicide. Victims also showed increased suspiciousness, paranoia, obsessive thoughts and sexual inactivity. Detachment from reality, lack of sleep, guilt, loss of interest, fear of encountering new situations, emotional numbness, self-blame, suicidal ideations and consistent worry about future (Kar, 2010) were other symptoms observed.

14.1.3 Principles of Disaster Mental Health Services

There has been a paradigm shift in mental health services for DM from relief-centred post-disaster management to a preventive, holistic, multidimensional, integrated community approach (Sundaram et al, 2008). Thus, disaster mental health services are now based on

the principles of "preventive medicine" (Math et al, 2008). The six "R's" are emphasized in this regard – readiness (preparedness), response (immediate action), relief (sustained rescue work), rehabilitation (long-term remedial measures using community resources), recovery (returning to normalcy) and resilience (fostering) (Math, 2013). The entire process may be a long-drawn affair, with rehabilitation, recovery and fostering resilience requiring long-term efforts. Community-based approaches to mental health, including disaster mental health, are extremely valuable because community-based services help reduce stigma, provide help at the person's doorstep and provide them with social support. In fact, preliminary research on resilience factors that protect people from developing mental health morbidities points out that a cohesive and well-networked community, community resources, minimal displacement due to disaster, good social support and strong family system are crucial for community resilience. Other factors include altruistic behavior on the part of community leaders, minimal materialistic needs, religious faith and spirituality. These were noted in the native population of the Andaman and Nicobar Islands of India and in survivors of the 2004 tsunami in Thailand (Math et al, 2008).

Community-based care and rehabilitation is a medium to long-term process. Hospitals, which play a key role in serving their communities through mass causality management, treatment and provision of emergency services during disasters can also contribute in multiple ways to provide mental health care to their patients who have just witnessed a disaster. Their role is crucial in providing immediate or short-term relief. However, through clinical services, medium- to long-term support can also be provided to those in need.

14.1.4 Role of a Hospital in Mitigating Mental Health Consequences

The services a hospital can render to victims of disasters in the pre- and post-disaster periods to mitigate the adverse mental health effects of the disaster can be divided into two categories:

1. **Provision of Psychological First Aid, Screening and Psychological Triage:** Psychological first aid includes immediate interventions that help in providing psychosocial support and reducing the level of actual or perceived stress that arises out of a disastrous situation, promote resilience, and prevent negative psychological and social consequences for the victims (Figure 14.4). During provision of psychological first aid, screening and assessment of victims is

Figure 14-4:Hospitals Can Provide Psychosocial Support

also crucial to identify those who are badly psychosocially affected and may need more formal and long-term therapy/clinical interventions.

2. **Clinical interventions:** These refer to the medical interventions by trained mental health professionals such as psychiatrists, psychologists, psychotherapists and mental health professionals for victims who experience clinical symptoms of mental disorders, whether common or severe. These facilities should also be made available to the hospital staffs, including frontline staff, nurses and doctors etc., who, as care providers, often experience mental health issues while providing care and treatment under stressful circumstances.

Psychosocial Interventions

Mental health management has been recognized as an essential component in DM plans (for both, man-made and natural disasters) by the Department of Mental Health of the World Health Organization (IASC, 2007). It is crucial to foster resilience and positive mental health at the individual and community levels to prevent psychiatric disorders after a disaster and to maximize the progress of successful rehabilitation and development of communities in the post-disaster scenario. Hospitals can take several steps to provide psychosocial support to victims of disaster. These include:

1. Training the nurses (and other hospital staff) to be lay counsellors and provide psychological first aid to victims of disaster (refer Figure 14.5 to understand the steps involved in psychological first aid). Psychological first aid refers to providing "humane, supportive and practical assistance to fellow human beings who have recently suffered exposure to serious stressors" (WHO et al, 2013). It involves:

Figure 14-5: Steps in Psychological First Aid

   • Providing non-intrusive, practical care and support

   • Calming and comforting patients

   • Assessing the needs and concerns of the victim/patient and screening to identify any additional interventions that might be required

   • Helping them address basic needs such as food and water

   • Listening but not pressuring patients to talk

   • Helping them connect to information, services and social support and monitoring the rescue and recovery environment

   • Protecting patients from further harm

   • Fostering resilience, coping and recovery

2. The nurses can help patients understand the importance of accepting stressors and finding means to deal with their suffering as part of a positive coping strategy.

3. As part of the psychological first aid of helping patients connect with services and support groups, and even taking care of their basic needs, the hospital can have institutional tie-ups with NGOs, community-based organizations or even people from the community, who can:

    a. Help reconnect patients with their loved ones so that their sense of belongingness and attachment remains intact.

    b. Provide legal and paralegal help to patients, should they need it.

    c. Provide material help in the form of food, shelter, clothes etc. once the patient is discharged from the hospital.

    d. Provide economic, vocational or social rehabilitation to them after discharge. Rehabilitations plans should take into account the needs of the victim and the cultural context of the community he/she belongs to (Figure 14.6 reiterates the need to provide whatever help is possible).

4. Research has shown that meditation and awakening the spiritual self can help people deal with external and internal stressors (Kar, 2010). Hospitals can help patients connect with such services/classes through referral services.

5. Bringing in a psychologist to impart stress management education and relaxation training to victims. The relaxation exercises could include breathing exercises (*pranayama*), progressive relaxation exercises etc.

6. Nurses and other staff involved in mass casualty management can be trained in psychological triage to screen and identify vulnerable and high-risk individuals and groups and arrange for immediate referrals for specialist help and treatment. In this context, it would be useful to follow the psychological training with mock drills to equip them with practical skills in identifying and referring victims for the right interventions.

Figure 14-6: Providing Whatever Help that Is required

Clinical Interventions

Most hospitals in India, especially large ones, have a department of psychiatry, which comprises of a team of mental health professionals including psychiatrists, psychologists and psychiatric social workers. Smaller hospitals that do not have a psychiatry department may have tie-ups with psychiatrists who offer consultations for a few hours a week. Patients who are experiencing PTSD, clinical depression or anxiety post the disaster can

Figure 14-7: Offering Clinical Services for Mental Health

avail of these mental health services. These services can be provided for a medium-to long-term period (Figure 14.7). Generally, the use of psychotropic medications is discouraged in DM because it is assumed that the victims are mentally stable people who have faced abnormal situations. Moreover, for most of them, the symptoms are self-limiting and go away in a couple of months. Psychiatric medications may be used only in cases of pre-existing mental illness to avoid relapses, such as for people with severe depression and suicide attempts as well as for patients with substance addiction and are facing complications related to substance withdrawal (Math et al, 2015).

14.2 Relevance of Psychological Triage in Identifying Persons Needing Psychological First Aid vs. Clinical Help

Triage, in medical terms, refers to the process of assigning degrees of urgency to wounds or illnesses to decide the order of treatment among a large number of patients or casualties. While the term is largely used in the context of mass casualty and emergency management, in recent years, it is being used for the provision of psychological care in times of disaster too.

This is because triage principles can be useful to assess and manage patients with psychological distress. The four steps in psychological triage include (1) assessing the severity, (2) looking for indicators that point to a diagnosis, (3) formulating a working diagnosis, and (4) treating the distress (Stroud, 2012).

As mentioned earlier, when psychological first aid is being provided, psychological triage can be undertaken to identify those who are at highest risk and to decide the order/priority of treatment accordingly (NATO, 2008). People who are identified as having a greater need for mental healthcare and support may need to be given formal interventions rather than lay counselling.

> *"Anything that's human is mentionable, and anything that is mentionable can be more manageable. When we can talk about our feelings, they become less overwhelming, less upsetting, and less scary."*
>
> **– Fred Rogers**

15. Planning for Hospital Safety

15.1 Trainers' Notes

A hospital that aims to develop a Culture of Safety and cultural maturity needs to not only facilitate Psychological Safety, reliability and resilience but it should also ensure that important decision-making is participative and brings in multiple perspectives. This is particularly true from the point of view of Hospital Safety. In addition, all members must be encouraged to contribute their own perspective to ensure that the solution or idea is well thought out. This module suggests one popular model – called the "Six Thinking Hats" – to facilitate participative as well as multidimensional thinking and decision-making.

Exercise on Nuclear/Lightning Disaster: Six Thinking Hats

The Six Thinking Hats exercise is a role-playing model that was conceptualized by Edward de Bono in 1985[10]. Often, team members think alike and thus solve a complex problem in a similar manner. This exercise is a team-based problem-solving and brainstorming technique that encourages teams to explore solutions in a creative manner and from different perspectives, thereby allowing them to uncover ideas that they might not have otherwise explored due to their mindsets and linear ways of thinking.

The basic idea behind this method is that different personality types think differently; for instance, a person who is emotional will think in a different manner from a person who is practical. Based on this premise, Edward de Bono identified six types of one-dimensional personalities that he calls the six "thinking hats". In this exercise, every member of the team will be asked to wear a different thinking-hat during a problem-solving or brainstorming activity. This will help them see things from a different perspective, based on the hat assigned to them, and thus provide different inputs.

The six types of thinking hats and the kind of information they should focus on while making decisions are shared in Figure 15.1.

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10 Edward de Bono. 1985. Six Thinking Hats. Published by Little Brown and Company. ISBN 0-316-17791-1
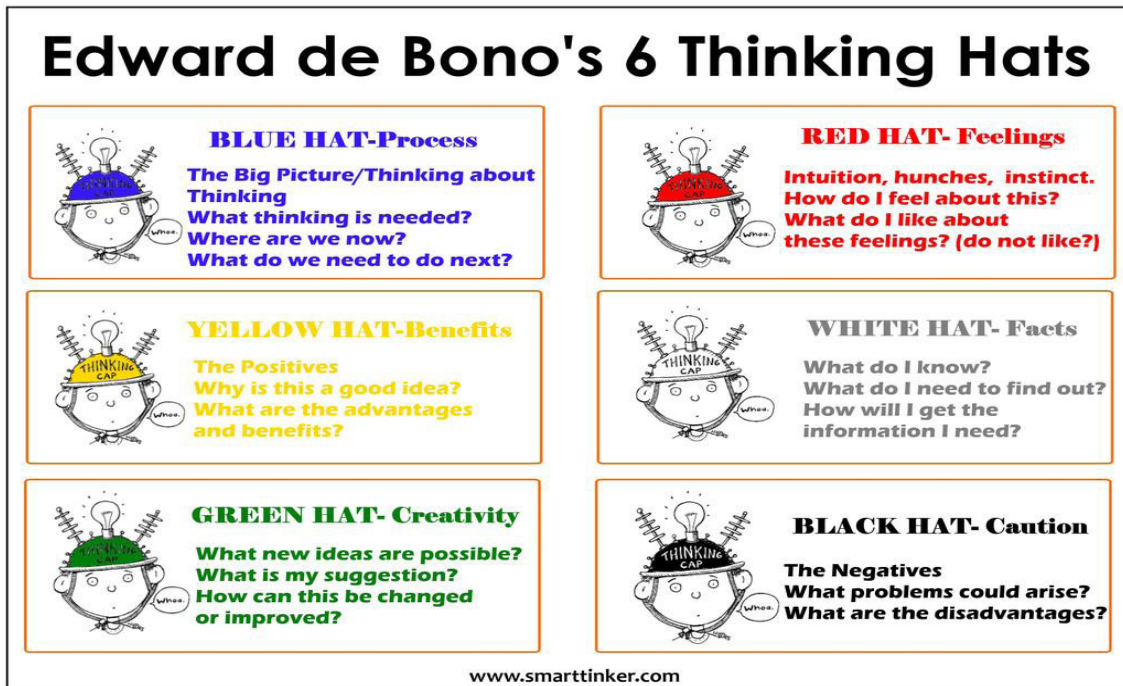
Why These Colors?

White hat: White is the color of purity and objectivity. The white hat permits a clean perspective that is based on facts, which is not colored by emotion or subjectivity.

Red hat: Red is the color of rage and emotion. The red hat permits emotions and subjectivity to dominate.

Black hat: Black is the color of gloom and pessimism. The black hat permits scepticism and pessimism to dominate.

Yellow hat: Yellow is indicative of brightness and optimism. The yellow hat permits positivity, goodness and optimism to dominate.

Blue hat: Blue is the color of the sky. It represents seeing the bigger picture.

Green hat: Green is the color of nature. Nature is creative and beautiful. The green hat permits creativity and the generation of new ideas, without worrying about the results or feasibility.

In this exercise, group members can be divided into groups of six to solve a problem. Each member will be assigned a hat and then has to adopt the perspective of the color assigned to them. In this manner, every team member will work on a problem jointly, but from their one-dimensional point of view. This will enable them to look at problems and solutions from six different points of view. This will facilitate the decision-making process and allow the outcome to be well thought-out.

The purpose of this exercise is to make participants understand that in disaster situations, it may be important for team members to dissect a problem in multiple ways to find the best solution.

16. Communication Systems and Managing Public Relations

16.1 Trainers' Notes

16.1.1 Understanding 'Communication'

Communication involves the exchange of information or messages between two or more people, in which the flow of information should take place without any disruption.

Along with the sender and the recipient, the message and the medium of communication are important components of this process. Figure 16.1 gives an idea of what the communication process entails:

Figure 16-1: Understanding Communication

Communication Process

The communication process involves eight key components: 1. source, 2. message, 3. channel, 4. receiver, 5. feedback, 6. environment, 7. context, and 8. Interference (Refer Figure 16.2).

- **Source**: The source is the entity that creates the message. This message is then conveyed either verbally, visually or in writing to the target audience, i.e., the receiver.

- **Message**: It is the information (verbal, visual or written) that the source creates and transmits to the receiver. In addition to the content of the message, the way it is conveyed (style, language, tone, etc.) is very important.

Figure 16-2: Communication Process

- **Channel**: The channel of communication is the mode of exchange between the sender and receiver. Messages can be transmitted verbally through face-to-face interactions, telephonic conversations, public address systems, videoconferencing, etc. They can also be written down and communicated through emails, memorandums, reports, social media posts, newspaper articles, blogs, text messages, etc.

- **Receiver**: The receiver is the targeted audience for the message. The receiver analyses and interprets the message.

- **Feedback**: Feedback is the message (verbal or non-verbal) that the recipient sends back to the source. It helps the source understand how the receiver perceives the message. It could be in the form of an answer or paraphrasing.

- **Environment**: The environment is the larger physical and psychological milieu in which messages are sent and received.

- **Context**: This implies the immediate setting, scene, and expectations of the individuals involved in the communication process. It could be physical, social or cultural. For example, a hospital staff member's mannerisms and style of communication can be different while communicating with the head of department in the hospital as compared to at home with their children or spouse or even at a party.

- **Interference**: Interference, also called noise, can come from any source. It refers to anything that creates a disruption in the flow of a message (McLean, 2005). This can be external or internal/psychological. For e.g., a language barrier or even a person's subjective beliefs and prejudice can interfere with how the message is received.

Types of Communication

There are four modes of communication: verbal, non-verbal, written and visual (refer to Figure 16.3)

Verbal communication: This refers to the use of words and language to speak with others. It can be face-to-face or over the telephone or video conference via programs like Skype, Zoom, etc. The communication may take place in formal or informal settings. For example, a friendly exchange of words

Figure 16-3: Types of Communication
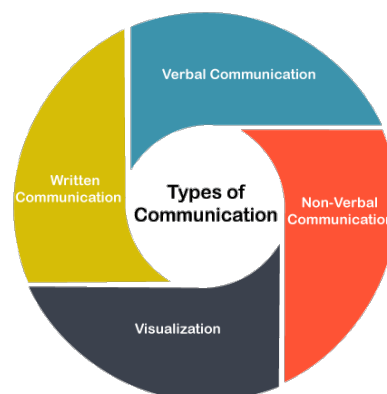
with an acquaintance over lunch is informal verbal communication while a work-related scheduled meeting is a formal one. In addition to the words, the intonation (pitch, tone, speed, etc.) used matters a lot. In a face-to-face conversation as well as video call, non-verbal communication and body language also matter a lot.

Non-verbal communication: Non-verbal communication can convey more that verbal communication. Non-verbal communication includes facial expressions, posture, eye contact, hand movements, and touch. For example, in a hospital environment, when a patient is sharing symptoms with the doctor, the receptiveness of the doctor is made evident through their non-verbal communication. If the doctor is looking away, avoiding eye contact and just nodding or saying "yes", the patient may perceive that the doctor is not giving their problems much attention.

Written communication: This is a formal mode of communication in which messages or instructions are conveyed through emails, circulars, bulletin, social media posts etc. The sole purpose is to communicate the information systematically and in an organized manner, without creating any confusion. The interpretation of the message by the receiver depends on how well the message is drafted by the sender. In written communication, it is almost impossible to rectify the message once it has been sent. Thus, the message has to be framed carefully.

Visual communication- This refers to the translation of ideas and content into visual form or images. Infographics, mind maps, charts, graphs and process flowcharts are some modes of visual communication. Documentaries and other videos are audio-visual in nature. One has to be very careful while communicating messages through visual mode since they have much that is open to interpretation. The slightest error can lead to wrong interpretations on the part of the receiver.

16.1.2 Role of Communication in Disaster Management

Managing disaster is an extremely complicated and multifaceted task in which the effective exchange of information between all the internal and external partners plays a pivotal role. All stakeholders involved in incident response need the right information to assess requirements, make decisions and coordinate activities (Seyedin 2011). Information is also useful for resource mobilization and providing quick assistance after the disaster. In addition to the technical operations, communication is also crucial for sharing information with the public, media and on social media platforms. How the organization disseminates information about the incident response to the public is also crucial to its reputation, as any negative communication can affect the credibility of the organization.

Unfortunately, when a disaster strikes, it often cripples the communication system, thereby creating an information gap, which may result in the spread of misinformation. It also leads to unnecessary chaos and confusion. Risk management involves communicating with the public during emergencies and choosing the right techniques for producing, exchanging, and disseminating information.

16.1.3 Possible Backup Methods for Communication During Disasters

It is difficult for any agency involved in DM to rely on any one communication tool during disasters, especially because communication networks are vulnerable to disruption during disasters. Nevertheless, the set of communication tools discussed below can be viable alternatives to both internal and external communication when other systems fail (Azmani et al, 2018; Adjusters International n.d.).

Cell/landline telephone: Mobile networks will perhaps be the first to be affected during disasters like cyclones, rains, etc. In addition to the destruction of towers, overloading is caused due to the massive surge in the number of people trying to communicate with their dear ones in different locations. This not only affects voice call mechanisms but also text messages and emails. Having a landline telephone as a backup can be very helpful for when cell phone signals are disrupted. Using the right technology will ensure that communication channels are open even when parallel systems are down.

Social media: In today's digital world, social media has emerged as an essential tool during crisis communication. Organizations can post different kinds of audio and visual messages through their social media accounts. Also, Google Crisis Response provides access to communication tools such as Google Public Alerts (emergency alerts), Person Finder and Crisis Map in times of need.

Satellite phone: Satellite phones work well in remote regions where there is no internet connectivity. Their reliance on orbiting satellites for their functioning makes them easy to use when the cell phone towers are down.

Two-way radio: A two-way radio (also known as a walkie-talkie) is a pair of handheld devices that can connect with each other, provided both are on the same frequency, within a certain distance. One user can talk while the other listens and vice versa. Emergency responders can use these radios in the field to quickly communicate with each other without clogging up cell phone lines.

Police scanner: This device allows the user to listen to all types of emergency communication that are relayed between officials in the police, rescue, fire and other DM teams. Although users cannot transmit messages themselves, they will be able to hear all the important information during an emergency situation.

Word-of-mouth: When all the above systems have failed and there is no other way left to communicate, information can be spread through word-of-mouth as well. A commonly associated risk with this mode of communication is that it leads to the spread of misinformation and rumour mongering.

The aforementioned systems are not fool- proof. They too can be vulnerable to failure during a disaster. Research should be done to introduce systems that can operate even if electronic systems fail.

Institutions have to communicate both with internal staff and external organizations during large-scale disasters. The channel of communication and its operability depends

on whom one is trying to reach, whether it is about working in tandem with other institutions (local fire and police departments and other emergency management services or similar institutions involved in disaster response), with the internal staff of various departments (internal communication) or providing information to the public. All these activities require a lot of communication and coordination, which is a huge challenge during a crisis. Another challenge lies in ensuring an organized and credible information exchange process with both stakeholders and the public given the environment of uncertainty during a disaster.

Effective communication planning and management during disasters should thus involve the following (Charlesworth, 2018):

- Developing an understanding of the context in which communication flow is taking place, i.e., key facts related to the disaster, population affected, etc.

- Understanding the specific information needs of the multiple stakeholders involved, which may include other DM agencies, government ministries/departments, humanitarian agencies, media and the public.

- Mobilizing resources effectively to improve the quality of work before, during and after a disaster or emergency.

- Integrating the communication process and information management with DM plans and strategies and not treating it as an isolated activity.

- Designating a lead person such as a Liaison Officer or Public Information Officer in the incident response system who will be in charge of coordinating the internal and external communication.

16.1.4 Role of Communication in Hospital Disaster Management and Incident Response

Hospitals are important frontline responders in emergency and crisis situations like floods, infectious disease outbreaks, cyclones, earthquakes, terrorist attacks and other natural and man-made disasters. This causes increased pressure on them during these times, especially since disasters exponentially increase the number of critical patients during mass casualty events. Any mismanagement on the part of the hospital during this crucial time will lead to the further deterioration of the situation. In the eyes of the public, the hospital staff will have failed to provide the required care and treatment. This necessitates the need for hospitals to be always in a state of readiness.

For the hospital (as the source of the message), the receivers of communication during times of disaster are many and can include:

External entities who are not directly response partners: This may include political VIPs, administrative officials, the public and the media. These people need to be updated in a timely and accurate manner. Any miscommunication or even concealed information about limitations, if found, can work against the hospital and its reputation.

External entities who are response partners: This could include all the agencies that are part of the institutional framework for DM such as NDMA, SDMA, DDMA, NDRF, SDRF,

police and security forces, fire agencies and so forth. The hospital should support the work of these agencies and work in close coordination with them and, thus, must be in constant communication with them.

Internal stakeholders: Last but not the least are the staff and patients (and their families) of the hospital. The staff of various departments may be a part of the HIRS, and there could be other staff members who are not a part of the HIRS but are involved jointly in service delivery at the time of disaster. They need to be kept informed. Similarly, the patients and their families also need to be kept informed about the disaster situation and the hospital's response.

The Public Information Officer (PIO) or Liaison Officer of the hospital, and in some hospitals the senior management, bear the responsibility of communication. Thus, it is important for them to have impeccable communication skills. They need to know what to convey and how much to convey; they should only communicate relevant facts to reduce the likelihood of any misinformation or fake news being spread. The content of the message as well as the medium that is used (social media, interviews, press, TV etc) must be very carefully chosen keeping in mind the context. It will help if hospital communication strategies involve a public relations component.

An effective communication process is crucial for an efficient hospital crisis response (Adini et al, 2014; Mosquera et al, 2015). In fact, communication is one of the most important parameters for evaluating the outcome of an effective hospital crisis response system as well.

16.1.5 Benefits of an Effective Hospital Communication Strategy

An efficient hospital communication strategy during disasters has the following benefits:

● When patients are able to satisfactorily communicate with Doctors, Nurses and other hospital staff, it enhances their trust and confidence in the hospital and thus increases compliance with treatment.

● When hospital staff are trained in communication skills, it increases their self-efficacy as they find themselves better equipped to communicate information to patients (especially information that is difficult to convey) and their peer group.

● Last but not least, a hospital's reputation is largely linked to the perception of the community and patients. If they find the hospital staff approachable and good at communicating with them even in the most adverse times, they will have a favorable opinion of the hospital, which will ultimately lead to continued business growth for the hospital.

Crisis communication is thus summarized as an organization's knowledge, appreciation, planning, and control over operations that harm the organization's reputation.

16.1.6 Communication Flow in a Hospital at Different Stages of the Disaster Management Cycle

Every stage of the DMC requires communication with a different set of stakeholders,

both internal and external.

- **Intra-organizational communication**: Messages shared among internal stakeholders (within the various departments in the hospital) are referred to as intra-organizational communication. There are numerous internal stakeholders: nurses, physicians, staff (anyone that works at the hospital), patients, visitors, the leadership team, patients' families, volunteers, faculty and students (if it is a teaching institute), managers and hospital owners (Liu et al, 2017; Zaboli and Sajadi). Face-to-face meetings, intranet messages and notices/circulars are the primary internal communication channels for hospitals to rapidly address concerns and share information.

- **Inter-organizational communication**: This involves the exchange of information between the hospital and external entities (both those who are response partners and those who are not, as discussed earlier). Holding regular meetings with the external stakeholders along with phone/email interactions comprises effective communication.

Figure 16.4 maps the important communication partners, both internal and external, of a hospital at different stages of the DMC. It must be noted that this list in only indicative and not exhaustive.

Figure 16-4: Communicating with Internal and External Stakeholders in the Various Cycles of Disaster Management

Prevention and Mitigation

Internal stakeholders - Nurses, doctors, other paramedical and non-paramedical staff, inspection/audit team
External stakeholders - Civil engineers, architects, equipment maintenance team, service providers for annual maintenance

Preparedness

Internal stakeholders: Nurses, doctors, other paramedical and non-paramedical staff, inspection/audit team
External stakeholders: Disaster management units of the government like the NDMA, SDMA, NDRF; Police, fire and other emergency services; academic, scientific and technical institutes, volunteers

Response

Internal stakeholders: Nurses, doctors, other paramedical and non-paramedical staff, inspection/audit team
External stakeholders: The public; media (print, TV and social); VIPs; government ministries/departments; other hospitals; the NDMA, SDMA, NDRF; military, police, fire and other emergency services; humanitarian agencies (international, NGOs, CBOs); and volunteers

Recovery

Internal stakeholders- Nurses, doctors, other paramedical and non-paramedical staff, inspection/audit team
External stakeholders- The Public; civil engineers, architects, the equipment maintenance team; service providers for annual maintenance; academic, scientific and technical institutes; volunteers and humanitarian agencies (International, NGOs, CBOs)

16.1.7 Communication Challenges in Hospitals During a Disaster

- **Misinformation and inadequate information** are key communication challenges during a disaster (Collins et al, 2016). They can create panic among both the public and the hospital staff. Some common reasons for miscommunication are a lack of coordination among the hospital management and staff, messaging errors while communicating with the public, lack of coordination between the hospital teams and the disaster response teams deployed at the site and rumour mongering in the absence of clear information.

- **Failing electronics and communication networks** like computer systems, cell towers, IT systems and phones pose another challenge. Runners may be an alternative to system failures, but they also have their own challenges (Chaffee et al, 2006).

- **Lack of capacity** among the staff due to inadequate training about how to communicate and what to communicate can be another challenge.

Research suggests that concisely and correctly notifying the internal staff of a hospital about the crisis is a tricky thing to do. As soon as disaster strikes, the staff get busy catering to the patients' needs. This is especially true in the case of an internal crisis like a fire in the hospital. The management team of the hospital, based on the resources available, can send audio and visual messages to the staff. Digital monitors can be used where available; internal text messages, disaster codes announced via loudspeaker systems and emergency alarm systems are some other possible methods.

16.1.8 Managing Public Relations: Skills that the Liaison Officer/PIO Must Possess

The communication skills that the Liaison Officer/Public Information Officer (PIO) or any other hospital authority involved in crisis communication must possess, especially for interacting with external stakeholders, have been shared below. In addition to these, they should adhere to the guidelines pertaining to the public relations policies of their hospital (Liu et al, 2018).

Active listening skills: Complete understanding of the situation and the context of what needs to be communicated is important. To gather and verify facts, probing for information and paraphrasing them is important. Training in soft skills and communication skills would be beneficial in this regard.

Understanding the audience and their pulse: Every set of stakeholders, internal and external, is interested in different kinds of information. Information cannot be generalized for all audiences. For instance, while certain information can be shared with the public and the media, others may have to be withheld as they may lead to widespread chaos or fear. However, the same information may be important to share with the internal stakeholders of the hospital. Sensitive information should be communicated very carefully.

Composure: For the person in charge of communicating important and sensitive information, composure is an especially important skill. Being in a state of heightened excitability or anxiety is likely to give away more information through non-verbal communication than is necessary or desirable.

Avoid oversharing: It is one thing to be transparent in providing information and another to overshare. Oversharing information may create unnecessary panic and, at times, may damage the hospital's credibility and relationship with the local community. Therefore, the person in charge of communication should be skilled at sharing information in a concise and specific manner.

Good at networking: The Liaison Officers/PIOs should have very good networking and negotiation skills. For instance, maintaining strong ties with the local media will come in handy in ensuring a swift response, as they can broadcast the message in regional languages and easily inform people. It is not unusual for media personnel to try to sensationalize a disaster and enter the OPD /emergency room to telecast a particular scene. This not only violates the privacy of the patient but also impedes the work of the hospital staff. Thus, the PIO should be strong enough to be able to avert such situations and not give in to media pressure of any kind.

Avoid misinformation: Any errors in internal messaging, such as about the extent of a fire, may lead to horrifying consequences and chaos in the form of a stampede or people impulsively jumping out of windows to save themselves. Similarly, there can be disastrous consequences if wrong information is shared with external entities. For instance, any incomplete or fake news on the media today can trigger fear, panic and even angry responses from the general public. Therefore, there should be no scope for a grapevine.

Empathic and inspiring: Communication skills are a type of soft skill. They convey a lot about a person's mannerisms, emotional makeup and personality. A person who is responsible for communicating about a sensitive matter like a disaster, which has so may psychological consequences, should also reflect care, concern and empathy towards the victims and not appear very cold and matter-of-fact. However, as mentioned above, they should also be composed. Empathizing with the patients and their families goes a long way in reposing their faith in the staff of the hospital. Such a person should also be good at keeping the morale of internal staff high by pepping them up and reminding them about their value for the hospital and patients.

17. Coordination with Multiple Agencies: The Hospital as an Embedded Entity

17.1 Trainers' Notes

17.1.1 Why "Embedded"?

The management of a disaster or crisis situation is a highly complex activity. It is not something that can be done in isolation by an individual. The stages of prevention, preparation, response and recovery require the convergence and collaboration of the existing administrative setup, civil society and various institutions (including hospitals) to carry out a large number of tasks. Of course, the activities involved in response management with vary depending on the nature, intensity and type of disaster. Disaster management,

Figure 17-1: The Hospital as an Embedded Entity

especially the phases of response and recovery, require several resources – human, financial, IT, communications and so forth, which is a challenge. The other big challenge is overcoming the lack of cooperation and synchronization among various agencies, which may arise due to a lack of role clarity among the stakeholders. All the stakeholders involved in response management, including hospitals, should realize that they are one small entity embedded in the macro system and thus have to work jointly with all the other administrative, civil and other agencies to achieve the goals of response and recovery (Refer Figure 17.1). If the response is well planned and all the stakeholders involved know their part (through training), the response is likely to be smooth and effective.

The NDMA brought out guidelines on the Incidence Response System (IRS) in 2010. These guidelines explain the roles and responsibilities of all the agencies involved in the disaster management process very clearly. The IRS recognizes the significance of partnerships and networking and thus provides a participatory, well structured, multi-disciplinary, multi-departmental and systematic approach to DM. The roles as well as the interdependence of NGOs, Community Based Organizations (CBOs), PRIs, communities and the private sector are recognized and given due recognition in the institutional framework (NDMA, 2010). The IRS can be applied regardless of the magnitude, location, category and complexity of the disaster. The institutional framework that has been developed for DM in India is shared in Figure 17.2, and it has been discussed in the module on SOPs. The figure further depicts other important institutional arrangements that are important as partners for resources and execution.

A look at Figure 17.2 shows that there are administrative bodies at the central, state and district levels such as the NDMA, State Disaster Management Authority (SDMA) and DDMAs, respectively, which are responsible for planning and coordinating all response strategies. The National Institute of Disaster Management works in close coordination with the NDMA and is responsible for all the training initiatives for DM. These bodies work closely with multiple other institutions such as the police and armed forces, government ministries and departments, and National Disaster Response Force (NDRF) and State Disaster Response Force (SDRF), among others. In addition, there are other organizations such as the fire services, home guard, National Cadet Corps (NCC), National Service Scheme (NSS) and Nehru Yuva Kendra Sangathan (NYKS), which can provide assistance during disasters. Technical, academic and scientific institutions also play a significant role in research and development activities. Finally, the role of the corporate sector, professional bodies, NGOs and CBOs (which work at the grassroots level) and the role and contributions of the community itself cannot be undermined as partners in the different phases of the DMC. Sources: Sanwal, L.M. (2018); Uttar Pradesh State Disaster Management Authority. (n.d.)

Figure 17-2: Institutional Arrangement and Important Partners
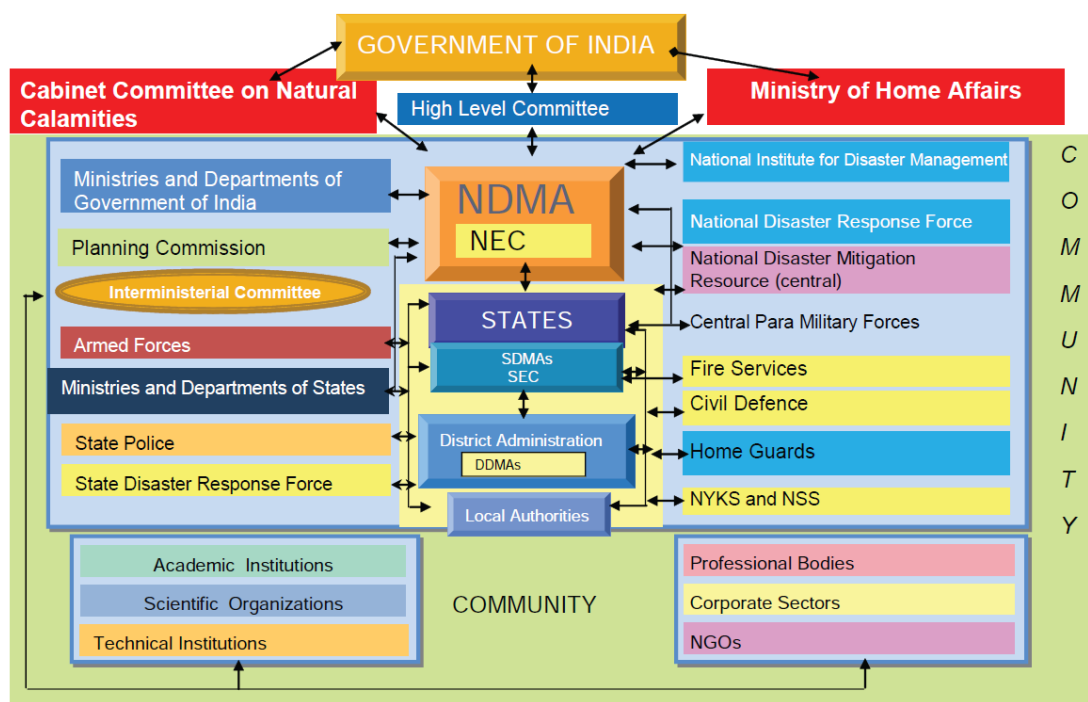
Given this context, it is clear that a hospital forms a part of the community response. A hospital may be run by an NGO, a CBO, a corporate or the government. It may have an academic institution attached to it. Regardless, gospitals often play the role of first receivers when disasters strike. When an internal or external incident occurs in a hospital, the safety of patients, visitors and staff within the hospital largely depends on how effectively the hospital responded to the situation and how resilient it was. Was it able to provide continuous services and if not, was it at least able to resume service provision quickly?

A hospital's response to a disaster is directly affected by how well-prepared it was to handle the disaster. Was a Hospital Safety Assessment done? Was an HDMP and HIRS in place? Were the staff adequately trained in DM and their roles during a disaster? Were regular mock drills and evacuation drills done? These are some relevant questions. Even if all of the above questions are answered in the affirmative, the ability and capacity of hospitals to function at their best during an incident depends on another important factor that facilitates their functioning – effective coordination with other responding agencies. By implementing an HIRS, hospitals should be able to "speak the same language" as these response partners and communicate and coordinate with them effectively.

17.1.2 Crucial Partners for a Hospital

It may not be possible for a hospital to forge partnerships with all the agencies mentioned in Figure 17.2. However, some partnerships that are essential for a hospital as part of its disaster response strategy are discussed below:

Administrative Agencies

A disaster may occur suddenly or it may come with prior warning. When there is prior warning, usually through the Indian Meteorological Department in the case of floods, droughts and cyclones, the hospitals in those locations should be alerted by the NDMA/ SDMA/District Disaster Management Authorities (DDMA). Even if a hospital does not receive intimation and a disaster strikes suddenly, it may connect with the SDMA or DDMA for assistance and to appraise them of the situation. Many a times, the NDRF, DDMA, SDMA or health departments may also send patients to specific hospitals with the required facilities for treatment.

Training Agencies

The National Institute of Disaster Management (NIDM) is the apex training body for DM in the country. The institute has already conducted many training programs for hospital doctors and other staff on DM. More hospitals need to approach the NIDM and other training institutes specialized in DM for assistance with training programs for all stakeholders.

Fire Services

There have been many fire-related incidents in hospitals. The cases of AMRI Hospital Fire of 2011 in Kolkata (West Bengal), SUM hospital fire in Bhubaneshwar (Orissa) in 2016 and Shrey Hospital fire in Ahmedabad (Gujarat) in 2020 are a few well-known examples. Many a times, hospitals are not equipped to handle the fire or smoke and may need assistance. Assistance is often needed for evacuation too. Hence, a partnership with the fire department becomes essential. Fire departments may provide any or all of the following services: Basic Life Support (BLS) and Advanced Life Support (ALS) medical care; ambulance transport; hazardous materials (HazMat) response and search and rescue (EMSA, 2014). Every hospital should have the contact details of its State Fire Department and its officials so that no time is lost in case immediate assistance is required.

State Police and State Disaster Response Force

If a terror attack or other man-made disaster occurs or if there are accidents involving mass casualty, the state police and SDRF personnel may need to be intimated. Thus, hospitals must not wait for incidents to occur to forge partnerships with them but should do so beforehand so that no time is lost in seeking help when required. Delays in the arrival of police when there is a police case involved may be detrimental to patient safety. Many a times, a hospital may need assistance from law enforcement for crowd control or management, chain-of-custody practices and professional reporting obligations that have to be followed (EMSA, 2014).

Health Department

All hospitals, government as well as private, have to work in close coordination with the District or State Health Departments. This is especially necessary for some hospital departments like the departments of emergency medicine, infection control etc. The interlinkage and coordination between the departments and hospitals become essential during a disaster response; thus, it is important for the Liaisons Officer or other senior officials of the hospital to be in touch with the health department. This will help to clarify roles and responsibilities, discuss response needs and develop strategies and procedures for keeping the healthcare system as responsive and operational as possible during disasters.

Forensic Department/Coroner's Office

There are some disasters that have a high morbidity rate. This could be in times of nuclear, radiation or chemical disasters. Even a pandemic like Covid-19 has led to a similar situation. In these cases, the medical examiner or coroner may need to be involved, along with the State/District Health Department. Hospitals should be aware of the procedures to be adopted in managing the deceased. For this, coordination with the medical examiner's office is important. have a high morbidity rate

Mental Health Specialists

Victims of disasters often go through a lot of mental trauma. This could be due to bereavement or loss of property and belongings. Thus, providing psychological first aid and clinical help to hospital patients who are going through Post Traumatic Stress Disorder (PTSD), depression and anxiety as a consequence of the disaster is important. Sometimes, hospital staff themselves may suffer from burnout while caring for patients during disaster response. Many of the larger hospitals have mental health and psychiatry departments that can tend to them. However, some of the smaller hospitals may not have these, which is why they should try to form partnerships with organizations, including NGOs, working in the provision of mental healthcare. They can offer assistance to both patients as well as hospital incident management personnel who need psychological counselling and help during disasters.

NGOs, CBOs, Red Cross and Other Voluntary Agencies

There are many NGOs, CBOs and international voluntary organizations such as the

Red Cross Society that are involved in humanitarian services during times of disasters. Hospitals should have tie-ups with such organizations so that they can ask for assistance if there is a need for additional volunteers or resources during incident response.

Other Hospitals

During mass casualty events and at other times when there is a surge of patients beyond a hospital's capacity, it is beneficial for hospitals to transfer some patients to other hospitals. This will not only help patients but will also prevent the hospital's resources from getting overworked and drained. Thus, it is beneficial for hospitals to work in a spirit of partnership with each other rather than in a spirit of competition. Hospitals could also have a formal agreement through which the processes for requesting assistance, sharing resources, initiating patient transfers, and even identifying mechanisms for reimbursement are spelled out. Furthermore, smaller hospitals and those providing only primary and secondary healthcare facilities may need to refer patients to tertiary healthcare centres and thus need to have referrals in place right from the preparation phase of the DMC.

Print and Television and Social Media

The Liaison Officer/ PIO of the hospital or even senior management (where a PIO is not present) should work to build effective working relationships with people from the media before an incident. This is because the media plays a key role in reporting information about any incident to the public. Networking with the media will ensure that information is communicated in a well-coordinated, timely and accurate manner. Any fake or inaccurate news can lead to confusion, anger, and loss of public trust.

The media and PIO/Liaison officer should work together in times of disaster to develop the risk communication strategy and messages for public education. It would be beneficial for the PIO/Liaison officer to have a format ready for communicating disaster related messages so that when disaster strikes, unnecessary time is not spent in developing the plan for communication. Moreover, a pre-developed format will ensure that information is crisp and that no unnecessary details have been shared.

In today's times, social media sites like Twitter, Facebook, YouTube and Instagram are immediate sources of information that are more popular than traditional media sources. The hospital's PIO may use social media to disseminate information to the public as well. A word of caution regarding social media messages – they must be clear, factual, precise and non-judgmental to avoid any controversies.

Effective coordination among healthcare partners is the key to delivering a timely and effective disaster response. This will ensure that all the crucial partners in the healthcare system remain part of the solution rather than intensifying problems during a response.

18. Monitoring, Evaluation and Compliance for Hospital Safety

18.1 Trainers Notes

18.1.1 Introduction to Monitoring and Evaluation

The monitoring and evaluation process provides information to the manager/administrator on the progress towards achieving the intended objective of any process activity or intervention (Kusek, 2004). The data generated by the monitoring process serves as a basis for any necessary corrections in policies, programmes or projects. The monitoring and evaluation process thus lays the foundation for evidence-based decision making.

Though monitoring and evaluation sometimes overlap each other, they are not the same. Monitoring tracks what is being done (primarily inputs and outputs) to assess whether programs are performing according to plan. Evaluation, on the other hand, assesses if we have achieved the desired results (outcomes and impact). Why Is Monitoring Crucial for Hospital Safety?

A hospital cannot be considered safe from disasters unless it has taken several steps to make it structurally and functionally safe. For instance, the hospital needs to have a building that is structurally resilient. It needs to have a practical and robust HDMP. A Culture of Safety should also be deeply ingrained in the system. But how can one measure if the inputs are adequate and of the required quality and if there has been efficient use of resources? Monitoring is a measuring tool that can be used to do just that. Monitoring can be done for a program, plan or an intervention to determine the progress, or lack of progress, towards achieving the desired objectives, which, in the current module, is Hospital Safety.

Monitoring is the routine tracking of any activity's progress by systematically gathering and analyzing data and information, thereby enabling informed decision-making. This tracking of key indicators helps identify the extent to which implementation has occurred and what progress has been made. This tracking can be done daily, weekly, monthly, quarterly or annually, based on the need.

To summarize, the monitoring process answers the following questions:

1. What is the status of the implementation process?

2. Are the activities aligned in the right direction?

3. Are the input interventions in line with the desired outputs?

For a hospital to keep track of how well it is prepared for both internal and external disasters, it must implement frequent drills, training and orientation, and simulation exercises. For purposes of accountability, those responsible for monitoring-related activities should ensure that these exercises are done on a regular basis and the outcomes are properly documented.

18.1.2 When Should Monitoring Take Place?

- Monitoring is a continuous process that should occur across the life cycle of a program.

- Monitoring is most effective when planned at the design stage of a program, taking into account all the resources (time, money and personnel) that will be required, and calculating and allocating them in advance.

18.1.3 Types of Monitoring

The different types of monitoring and what they entail for a hospital setting in particular are described in Figure 18.1.

Figure 18-1: Types of Monitoring Relevant for Hospitals

Process monitoring (Activity monitoring)	Tracks the use of inputs and resources, along with examining how the activities and outputs of a hospital are delivered. Often conducted in conjunction with compliance monitoring and feeds into the evaluation of impact.
Compliance monitoring	Undertaken to identify if the hospital's activities comply with standard guidelines, governmental regulations and laws, ethical standards, and most importantly, the expected results of the project. The need for compliance monitoring could arise at any stage of the project life cycle.
Context monitoring (situation monitoring)	Analyses the external setting, which has a bearing on the operational activities of the hospital. Identifies and measures risks, assumptions, or any unexpected situations that may arise at any point during the operation of hospitals. Helps in identifying the impact of these external factors on hospital activities.
Beneficiary monitoring (Beneficiary Contact Monitoring (BCM))	Tracks the overall perceptions of patients in relation to the services provided at the hospital. Tracks patients' satisfaction or complaints with the project and its components, including their participation, treatment, and access to resources, and whether these are equitable, and their overall experience of change. Tracks stakeholder complaints and feedback mechanisms.
Financial monitoring	Used to measure the financial efficiency of a project. Measures the actual expenditure incurred by the hospital in comparison to the budget allocated. Based on this, deficit or surplus strategies would be designed to maximize outputs with minimal inputs. Often conducted in combination with "process" and "compliance" monitoring and is crucial for accountability and reporting purposes.
Organisational monitoring	Tracks institutional development, communication, collaboration, sustainability and capacity-building within the hospital and with its partners and stakeholders in relation to project implementation.
Results monitoring	Used to assess the impact created by the hospital. It helps the hospital team ensure that the project is on the right track. This is where monitoring is often confused with evaluation.
Progress Tracking	It helps in identifying whether time-bound activities in the hospital are completed within the stipulated timeframe. Every activity has set of output targets to meet. Progress tracking is useful in capturing progress against these. In a tracking sheet, all output indicators for key activities are outlined, and the target values for these indicators are marked against it along with the scheduled timeframe for the activities. Progress is to be entered against those targets, and the deviation from the set target, if any, has to be noted.
Performance Monitoring	Every activity will have a set of performance or outcome indicators that it has to achieve. Performance monitoring is used to assess the "value for money" of any activity by analysing these performance indicators. For e.g., if money has been spent on retrofitting, will the structure be able to withstand an earthquake?

18.1.4 Monitoring the Safety Process in a Hospital

The purpose of monitoring along with the indicators that need to be tracked and the methodology to do so should be identified. The tools for data collection, the participants, and time and place of data collection should be determined. Then, data management and analysis are to be conducted and the findings should be compiled as a report. Some questions that need to be answered are as follows:

● Has patient care in the hospital been safe in the past? This will involve an assessment of the rate of past harm to patients (both physical and psychological).

● Are the hospital's clinical systems and processes reliable? This will involve an assessment of not only the reliability of safety critical processes and systems but also of the capacity of the staff to follow safety critical procedures.

● Is there adequate patient safety today? This is based on the availability of information and capacity to monitor patient safety on an hourly or daily basis.

● Will care in the hospital be safe in the future? This refers to the ability to anticipate and be prepared for future problems and threats to safety.

● Are we responding and improving? This will involve an assessment of the capacity of an organization to detect, analyze, integrate, respond to and improve from safety information.

These five questions lead directly to the five dimensions of the framework by Vincent: (i) past harm; (ii) reliability; (iii) sensitivity to operations; (iv) anticipation and preparedness; and (v) integration and learning (Vincent, 2014). Figure 18.2 shows the key features of each dimension.

Figure 18-2: Five Dimensions of Monitoring

Source: Vincent, Burnett, & Carthey (2014)

18.1.5 Distinguishing Between Monitoring and Evaluation

Evaluation involves the systematic collection of information on any activity, process, output, and outcome. While monitoring is a continuous activity, performed at the functional level of management, evaluation is a periodic activity, performed at the business level. It is a scientific process that gauges the success of a project or program in meeting its objectives. It measures the effectiveness of an activity by ascertaining whether the inputs and outputs have resulted in the desired outcomes. It provides feedback that helps programs analyze the consequences, outcomes and results of actions.

The evaluation process answers the following questions:

• Have the activity inputs been able to achieve the desired objectives?

• Are the outcomes and impact of the plan or intervention in tune with what was envisioned?

• What is the effectiveness, relevance and impact of the activities being carried out?

If the activity or intervention has been successful, it should manifest in the form of the required change in the knowledge, attitudes, behaviors and skills of the staff.

18.1.6 When Should Evaluation Be Done?

Evaluations are usually conducted at the end of any activity. But they can also be done during the activity process provided the information is being collected throughout the process. Collecting baseline data is crucial for carrying out any evaluation activity.

For ensuring Hospital Safety, every plan and activity chalked out should be measured and assessed. Accordingly, corrective actions should be planned and implemented. There is a persistent need for valid, reliable and effective tools for conducting disaster response management evaluations.

18.1.7 Types of Evaluation

There are various types of evaluation processes, depending on the process and the time of evaluation. The types of evaluation relevant to Hospital Safety are shared in Figure 18.3.

Figure 18-3: Types of Evaluation for Hospital Safety

Formative Evaluation	Formative evaluation is carried out during the initialization of activities for making the hospital safety compliant or at the inception of the implementation process. It helps in identifying areas of improvement and aids in developing the baseline for subsequent monitoring.
Process Evaluation	Process evaluation is done after the initialization of implementation activities, and it helps in measuring how effective the plans and activities have been in making the hospital safety compliant. It helps in identifying bottlenecks and streamlining the implementation process.
Outcome Evaluation	Outcome evaluation is conventionally used after activities have been carried out for some time. It generates information on the outcomes achieved and to what extent these outcomes are attributable to the safety processes being carried out in the hospital.
Economic Evaluation	Economic evaluation is used to measure the benefits of the safety processes carried out against the costs involved. This is done at the beginning of the implementation process or during its operation to identify and remove any inefficient practices.
Impact Evaluation	Impact evaluation will study the entire compliance activity from beginning to end (or at whatever stage the program is at), and tries to assess whether the efforts have been successful or not in achieving their objectives. It is done after the implementation process is over or at pre-selected intervals during the process.
Summative Evaluation	Summative evaluation is conducted after all the safety compliance processes have been completed. It generates data about how well these processes have delivered benefits to the target population.
Goals-Based Evaluation (also known as 'objectively set evaluation)	Goals-based evaluation is usually done towards the end of the program or at pre-selected intervals. Development programs often set 'SMART' targets — Specific, Measurable, Attainable, Relevant, and Timely — and goals-based evaluation measures progress towards these targets.

Development programs with effective monitoring and evaluation frameworks use different types of evaluations at different points of time or at the same time for entirely different purposes.

The first step in the evaluation process is to construct a conceptual map depicting the resources deployed, input activities being carried out, the intended output and the outcome to be achieved. Creating a set of Key Performance Indicators (KPIs) is the next crucial step in the evaluation process. KPIs are the metrics for assessing the different parameters of this conceptual map. For KPIs, we need to identify what critical processes should be included in healthcare safety systems. We also need to determine what process measures can serve as indicators of quality for processes critical to ensuring patient safety. After gathering information related to these aspects, an analysis of the collected data needs to be conducted to ascertain whether the input activities have been able to create the desired impact. Based on the inferences, the findings can be applied to future learning.

18.1.8 Benefits of Monitoring and Evaluation Activities

There are various advantages to carrying out monitoring and evaluation activities. These are enumerated below:

- They help in using resources more efficiently.

- They ensure accountability for every stakeholder.

- They assess whether a project has achieved its objectives.

- Learning from the project activities can be helpful for future endeavours.

- They improve the service delivery process.

- They provide information for better decision making and management of resources.

For ascertaining continual improvement, monitoring and evaluation should be an ongoing process of learning and development. The key to evaluation is to identify the indicators and understand what is being measured. A program cannot be monitored and evaluated unless it has clearly defined indicators. Therefore, effective strategic and operational planning and the incorporation of clear measurable objectives are important elements of the monitoring exercise.

It is essential to ensure that the system in a hospital prompts the need for review of the emergency plan (Inter-agency Working Group on Reproductive Health in Crises, 2010). These reviews would comprise evaluations of the appropriateness of the objectives, targets and performance measures of the Hospital Safety plan. Reviews at regular intervals ensure the continued suitability and effectiveness of the program. The need for review may arise out of changes in legislation, advances in technology and equipment, findings of audits and reporting or learnings from other incidents.

18.1.9 Compliance

Compliance in general means conforming to a rule, such as a specification, policy, standard or law. It is not only about development and enforcement of regulations, but also about social transformation, where organizations and communities appreciate the benefits of safety codes and follow them willingly. It includes prevention, detection and corrective action. While adhering to written policies form a part of prevention, monitoring is necessary for detection and evaluation is important to implement any corrective action.

In the context of hospital settings, compliance refers to the continuous process of abiding to legal, ethical, and professional standards applicable. It entails the effective development of processes, policies, and procedures to ensure appropriate conduct, educate staff and monitor adherence to all the prescribed professional standards.

18.1.10 Four Core Elements of Compliance in the Context of Emergency Preparedness in Hospitals

There are four core elements that must be included in order to comply with the emergency preparedness program, which must be reviewed and updated annually:

Risk Assessment and Planning

The facility needs to conduct a risk assessment (also known as a hazard vulnerability assessment [HVA]). The risk assessment or HVA is an integrated approach that focuses on capacities and capabilities critical to preparedness for any emergency or disaster, including care-related emergencies, equipment and power failures, natural and man-made disasters as well as communication disruptions.

Communication Plan

A key element of the communication plan identifies who to contact, what the contact will be able to provide, and how to reach them. This will include contact information for staff, physicians, volunteers, other hospitals/clinics and government entities like central, state, regional and local emergency management agencies like the DDMA or the SDMA. This information needs to be regularly updated so that it remains useful.

Policies and Procedures

The emergency preparedness plan must comply with central, state and local laws. Policies and guidelines for Hospital Safety and emergency management protocols must be adhered to. This will mitigate the risks of violating existing laws and help avoid any legal complications arising at a later stage.

Training and Testing

A training and testing program, based on the risk assessment, emergency plan, communication plan and the policies and procedures need to be developed and maintained. The program should address and identify who the trainees should be, how often they should be trained, and the staff's knowledge of emergency procedures. A facility-based tabletop exercise that challenges the facility's emergency plan can be incorporated in the training phase. All training and exercises must be documented, analyzed and incorporated into the facility's emergency plan.

18.1.11 Is Your Facility in Compliance?

There are a few questions to ponder upon in order to review if the facility is in compliance to emergency preparedness norms. These are:

- Has a risk assessment/HVA been conducted?

- Does the hospital have an emergency and communication plan in place?

- Have all types of hazards been taken into account?

- Does the communication plan contain an updated list of emergency contacts to provide services during and after the disaster?

- Is the facility adhering to the current rules and regulations?

- Have all the safety norms been adhered to?

- Do the safety guidelines spell out all the structural, non-structural and functional norms as laid out in the guidelines?

- Do all plans provide for the well-being of the patients in the hospital?

- Are all plans updated annually?

- Are internal and external audits regularly conducted?

- Have full-scale facility-based emergency training exercises or individual facility-based exercises been conducted in the hospital?

- Have training exercises been documented?

- Is there a compliance officer who is responsible to manage both manage <u>compliance risk</u> and pass a <u>compliance audit</u>?

18.1.12 Compliance as an Integral Part of Hospital Safety

Compliance is not just a legal requirement; it is also a critical condition to provide safe and high-quality patient care. Regardless of the size or specialty of the facility, all hospitals have to comply with the norms prescribed for their facility type. Being compliant means that they have a plan in place to keep operations underway in a medically safe environment and are able to meet the needs of patients.

Safe hospitals have a vision and commitment to ensure that they are fully functional especially in times of emergencies and disasters. Hospitals should remain accessible and functioning, at maximum capacity and within the same infrastructure, during and immediately following disasters, emergencies or crises.

To ensure compliance with the safety standards, hospitals need to ensure that they address their vulnerabilities by strengthening all structural, non-structural and functional aspects. The structural features (location and design specifications and the resilience of the materials used in the construction of hospitals) contribute to their ability to withstand adverse natural events. Hospitals should be able to cater to the increased demand for hospital beds as an aftermath of disaster. They should be able to adequately maintain the medical and support staff by retaining and hiring outside personnel in the time of crisis. Equipment and tools should be adequate and fully functional at all times. Even the basic services like electrical power, water and sanitation and waste treatment and disposal affect the performance of the entire hospital and thus should be taken care of as a part of disaster response.

In India, the Clinical Establishments (Registration and Regulation) Act, 2010 has been enacted by the central government to provide for the registration and regulation of all clinical establishments in the country with a view to prescribe the minimum standards of facilities and services provided by them. The Clinical Establishment Act standards for hospitals serve as a guide to ensure that the hospital is compliant with safety practices.[11] The key areas of focus of these guidelines include infrastructure, medical equipment and instruments, drugs, medical devices and consumables, human resource requirements, support services, legal/statutory requirements, record maintenance and reporting and basic processes.

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11 http://clinicalestablishments.gov.in/WriteReadData/147.pdf accessed on March 3, 2021

19. Man-Made Technical Disasters: Hospital Information Systems and Cyber Security Disasters

19.1 Trainers' Notes

Hospitals are increasingly making use of information systems to store, manage and use patient, medicine and hospital related data. While technology has been a boon for hospitals by providing them with the means to handle all the huge amount of data efficiently and minimize human errors, it has also posed a new kind of threat or disaster – cyberattacks. Fortunately, they are preventable. This module attempts to help participants understand what information systems are and how they differ from information technology (IT). It then moves on to explaining Hospital Information Systems (HIS), their types, their benefits and how they can facilitate patient safety and the challenges in using them. It sheds light on the ways in which a cyber security breach can be a disaster for a hospital and how it can be dealt with.

19.1.1 Information Systems vs Information Technology

Information systems refer to the various coordinated networks that can be used to acquire data and then filter, process, distribute, and store it (in short – to process information). Information systems have been in existence for ages to store data. However, earlier, data was stored manually in the form of journals, ledgers, drawings, etc. It is in modern times that IT is being used for the management of information

Figure 19-1: Inputs required for Information Technology Based Systems

Source: Information Technology. (n.d.).

systems. Information systems can be categorized based on the type of information for which they are being used. Thus, for example, in a hospital system, there could be one category for storing patient information and another one for storing financial data.

IT, on the other hand, refers to integration of computers with telecommunication equipment for storing, retrieving and manipulating data. Computer-based information systems involve a level of precision, which may not apply to other types (*Information Systems vs Information Technology,* n.d.). It also makes the process of filtering, processing and using data substantially easier. Figure 19.1 enumerates the various inputs for IT based systems.

Both information systems and IT have evolved immensely over time. While information systems have moved from manual record keeping to the current cloud storage system, IT has moved from big, slow systems to processors that are extremely fast and storage devices that are extremely small.
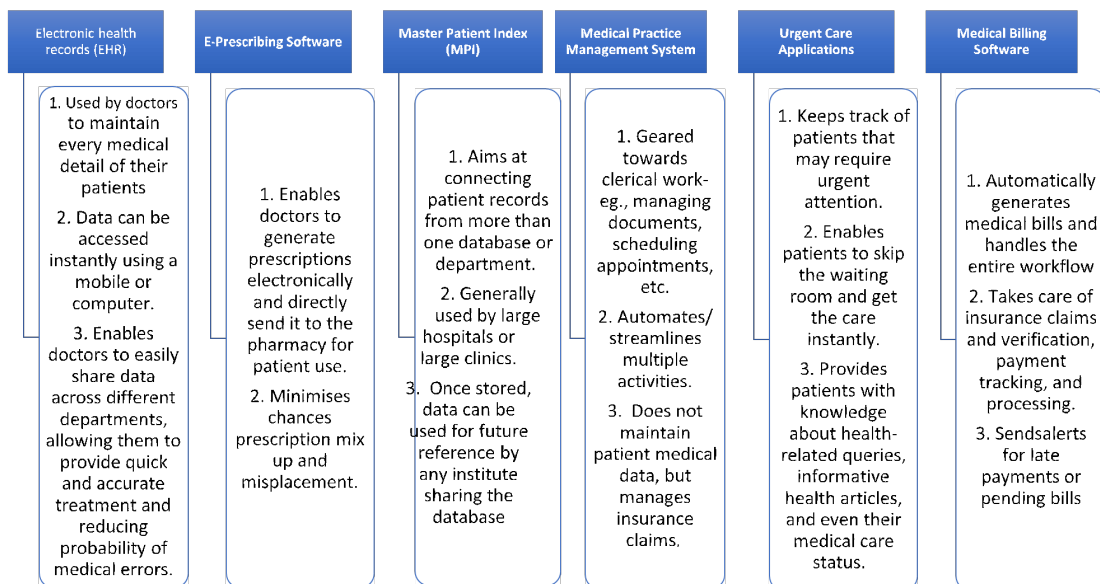
19.1.2 Hospital Information Systems and Their Types

In the current times, the HIS has become an integral part of healthcare. It is linked to health informatics and is a comprehensive, integrated information system that can manage all aspects of a hospital's operation, such as the medical, administrative, financial and legal issues and the corresponding processing of services. HIS is also known as hospital management software (HMS) or hospital management system.

Due to the increased use of IT, the HIS in most hospitals, especially in urban areas, make use of computerized systems to store, share and analyze the data collected. However, the use of traditional file cabinets and paperwork is still prevalent in small rural hospitals. A computerized HIS is made up of steps such as data input, processing, outputs and boundary. To explain further, the computer system receives the health data, it gets processed to finally produce the specified outputs, and there are predefined boundaries for the outputs. The design of most HIS is based on outputs.

There are several types of HIS. An indicative list of some of them and their purpose is shared in Figure 19.2.

Figure 19-2: Some Types of HIS

Electronic health records (EHR)	E-Prescribing Software	Master Patient Index (MPI)	Medical Practice Management System	Urgent Care Applications	Medical Billing Software
1. Used by doctors to maintain every medical detail of their patients 2. Data can be accessed instantly using a mobile or computer. 3. Enables doctors to easily share data across different departments, allowing them to provide quick and accurate treatment and reducing probability of medical errors.	1. Enables doctors to generate prescriptions electronically and directly send it to the pharmacy for patient use. 2. Minimises chances prescription mix up and misplacement.	1. Aims at connecting patient records from more than one database or department. 2. Generally used by large hospitals or large clinics. 3. Once stored, data can be used for future reference by any institute sharing the database	1. Geared towards clerical work- eg., managing documents, scheduling appointments, etc. 2. Automates/ streamlines multiple activities. 3. Does not maintain patient medical data, but manages insurance claims,	1. Keeps track of patients that may require urgent attention. 2. Enables patients to skip the waiting room and get the care instantly. 3. Provides patients with knowledge about health-related queries, informative health articles, and even their medical care status.	1. Automatically generates medical bills and handles the entire workflow 2. Takes care of insurance claims and verification, payment tracking, and processing. 3. Sendsalerts for late payments or pending bills

Source of Information: (Chaware, 2020)

19.1.3 Benefits of Hospital Information Systems

1. HIS makes it easy for hospitals to access large volumes of patient data and their medical history.

2. Brings in data accuracy and reduces chances of medical errors, thereby increasing patient safety.

3. Prevents duplication of data.

4. Ensures efficient and accurate management and monitoring of patients' treatment –medication, diet plan, drug usage etc. This leads to the reduction of adverse drug interactions, facilitating patient safety.

5. Easy to use and eliminates mistakes that occur due to illegible handwriting.

6. New computer systems and technologies offer high performance and allow the use of data/information from servers or cloud servers (Chaware, 2020).

7. Healthcare information systems can enhance the profitability of a hospital by increasing efficiencies, cost-effectiveness and safety of medical deliveries (Devaraj & Kohli, 2000). For instance, they can reduce record-keeping expenses, improve workflows, practice management and billing, thereby increasing cost-effectiveness. They can also reduce patient visits to receive tests results, enhancing medical service delivery. They are also likely to reduce the risks of malpractice lawsuits (Goldschmidt, 2005) due to reduced medical errors, thus bringing the costs for hospitals as well as patients down.

19.1.4 Cyber Security Breach as a Disaster for Hospitals and Healthcare Settings

Security of information as well as the HIS is critical in a hospital. While IT has made the collection, storage, retrieval and analysis of data simpler, some challenges arise with the management of the personally identifiable data of patients. Privacy and confidentiality of all the data collected must be ensured. This can be a challenging task because the healthcare industry is a prime target for cyber criminals. Hospital computer systems can be attacked by hackers to steal or use patients' medical or financial annals. The data can be used for criminal activity or to create disorder and generate fear. Stolen protected health information (PHI) is worth hundreds, even thousands, of dollars on the black market (Morrow, 2020).

Cyberattacks are a man-made, technological disaster since they threaten the hospital's IT, its underlying safety measures, and its staff's ability to care for patients and respond to emergencies. The risks involved with cyberattacks are many – the loss of patient information, disruption of care because of software unavailability, power outages and destruction of generators and risks to the operational integrity of personal medical devices (e.g., implantable cardioverter defibrillators, insulin pumps, pacemakers etc) (CDC, 2016). The social impact is the loss of confidence among patients and the public in the hospital because of the perception of inadequate security. The increased use of connected medical devices, equipment and other Internet of Things (IoT) devices, especially in large urban hospitals, has brought with it new risks to manage.

The problem with a cyber breach is that by the time it is noted and reported, the data is already misused or sold online. The one good thing about cyber security related disasters is that if well prepared, a hospital can avoid any kind of data breach. In order to understand what can be done to avert the disaster, it is first crucial to understand the challenges to data security and threats therein.

Challenges to Data Security

What exactly are the challenges to data security? A few of them are discussed below:

1. **Budgetary Constraints.** For long, spending on cybersecurity has been treated similar to purchasing insurance. While hospitals spend on upgrading their HIS, data security is taken for granted. It is assumed that data will be safe and no hacker can gain access to information. After all, such problems happen only to one out of many cases! It is only in recent years, with cases of cybersecurity threats increasing in the healthcare sector, that hospitals have started paying heed to data security (Morrow, 2020).

2. **Human error:** Some studies indicate that quite a few breaches happen due to human error (Figure 19.3). For example, the 2019 Data Breach Investigation Report (DBIR), points out that in healthcare in

Figure 19-3: Different Cyber Security Concerns for a Hospital

USA, a substantial number of security breaches could be attributed to privilege misuse, phishing (web application) attacks and use of data stolen through hacking. The report also identified that insider incidents, both malicious and accidental, are more common than external attacks. Another report by Egress (2019) similarly found that 61 percent of information technology leaders believed that data had been exposed deliberately, compared with the 79 percent who felt that employees had put data at risk accidentally. The study further stated that 'curious' employees can also endanger data security by accessing and sharing data without permission.

For instance, 60 employees at a hospital in the US were fired for accessing and sharing information on a celebrity patient. Data breaches can occur due to careless mistakes like weak passwords, using infected pen drivers, leaving your laptop or computer accessible to others and so on.

Figure 19-4: Ransomware Attack

3. **Third- and fourth-party security risks:** Many hospitals outsource services such as catering, payroll and web development to third party vendors. These vendors thus have access to sensitive information, which can be more vulnerable to attacks from outside the organization. This may specially be true if the hospital is not aware of how the vendor manages security.

4. **Ransomware and Malware:** Medical facilities are easy targets for ransomware attacks (Figure 19.4). Since they rely on full-time access to medical records to serve their patients, they have no option but to pay ransom to recover data. Similarly, social engineering strategies such as phishing and spear-phishing to deliver malicious emails, attachments and links with malware are other ways through which the HIS can be affected (Figure 19.5).

Figure 19-5: Malware-A security threat to HIS

19.1.5 How can Cyber Disasters be Averted?

As mentioned earlier, this is a man-made, technological disaster. Through increased training, vigilance among leadership and staff and proper data backup plans, such disasters can be averted. Figure 19.6 showcases the 3 keys steps to handle cyber-attacks.

1. **Capacity strengthening:** Increased staff training on IT systems and cyber security, coupled with hiring more skilled IT security practitioners can enhance cyber defence significantly. In particular, security awareness training and attack simulations can sensitize the staff to identify common threats like phishing and reduce such disasters.

2. **Leadership position for IT:** It is critical for a hospital that is extensively using HIS to have a leadership position like Chief Information Security Officer who has a skilled team of IT professionals to work towards safeguarding against any IT security concerns. Hospitals that have budgetary constraints could also opt for professional assistance from an external partner to prevent phishing on connected devices.

Figure 19-6: Strategy to Handle Cyber Attacks and Disasters-Prevent, Detect and Respond

3. **Policies and procedures for cyber security:** It would be useful for hospitals to design and implement procedures to spot and stop security violations, take up

risk analysis to determine vulnerabilities and ensure that steps have been taken to reduce risk. The hospital can also frame a sanction policy to deal with staff members who violate the policies and procedures.

4.   **Data backup:** It would be greatly beneficial for a hospital to have data backup so that just in case there is a cyber-attack, the hospital is not left in a lurch without the data. Data backup is one significant way to secure information.

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