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at

NHSRC, Udaipur, Rajasthan
(01 Feb - 30 April 2019)

Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan)

By
Dr Fajr Shah
PG/17/018

Under the guidance of
Dr Nitish Dogra

Post-Graduate Diploma in Health &Hospital Management
Batch 2017-19

International Institute of Health Management Research,
New Delhi
2019

Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan) (01 Feb - 30 April 2019)

Internship and Dissertation Report Submitted in Partial Fulfillment of the Requirements for the Award of

Post-Graduate Diploma in Health and Hospital Management

Batch 2017-19

By

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PG/17/018

Under the guidance of

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2019

Abstract

Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan)

Aim of the study was to assess and compare the functional safety and capacity status in Government health facilities in Udaipur and Banswara Districts (Rajasthan) in response to disasters and provide strategies to increase preparedness against emergencies.

Objectives of this study was to analyze the aspects from the perspective of an health administrator and assess and compare the functional safety and capacity status in government health facilities in Udaipur and Banswara in response to disasters and to identify potential capabilities and recommend safety strategies for health care facilities for making their response effective and efficient in times of emergencies.

In **Methodology,** the functional capacity was evaluated and calculated using the Hospital Safety Index (HSI) from the World Health Organization Checklist duly modified. The sum of the elements for each sub-module led to a total sum, in turn, categorizing the functional capacity into one of three categories: functional (High), at risk (Average) or, inadequate (Low). The study was carried-out in Government Health Facilities (District Hospital and Community Health Centre(CHC)) at Udaipur and Banswara districts respectively in Rajasthan. It is Cross sectional Descriptive study. The study period was from 01 Feb to 30 Apr 2019 in three phases. Purposive convenience sampling was used for the study. For data collection, WHO Hospital Safety Index checklist duly modified has been used. But for the purpose of this study, only the questions/elements related to functional safety in the checklist have been assessed.

Major **findings/results** from the study suggests that post the identification of weaknesses and shortcomings in health care facility, disaster preparedness efforts needs to be put to make them more responsive and effective in times of emergencies. Since largest number of patients receive their regular health care at government heath care facilities, there is an urgent need to validate their disaster preparedness levels based on their functional capacity using WHO guidelines suitably modified.

To **conclude** the Hospital Safety Index can be suitably modified and used for comparing the government health care facilities and post disaster risk reduction and rectification measures they are likely to function effectively during disasters.

Key Words: Functional Capacity, disaster risk reduction, hospital safety index, primary health care, interruption of services.

(Completion of Dissertation from Respective Organization)

The certificate is awarded to

Dr Fajr Shah

In recognition of having successfully completed her

Internship in the department of

NHSRC, Udaipur, Rajasthan

And has successfully completed her Project on

Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan)

From 01 Feb – 30 Apr 2019

NHSRC, Udaipur, Rajasthan

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavours

Dr Himanshu Bhushan
Advisor, PHA
NHSRC, New Delhi

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr Fajr Shah, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at NHSRC, Udaipur, Rajasthan from 01 Feb to 30 Apr 2019.

The student has successfully carried out the study **"Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity : A Comparison between Udaipur and Banswara Districts (Rajasthan)"** which was assigned to her during her internship training and her approach to the study has been sincere, scientific and analytical.

The internship is in fulfillment of the course requirements.

We wish her all success and very best in all her future endeavours.

Dr Pradeep Panda
Dean(Student Affairs and Academics)
IIHMR, Delhi

Dr Nitish Dogra
Associate Professor
IIHMR, Delhi

CERTIFICATE OF APPROVAL

The following dissertation titled **"Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity : A Comparison between Udaipur and Banswara Districts (Rajasthan)"** is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Heath and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve and statement made, opinion expressed or conclusion drawn there in but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for Evaluation of the Dissertation.

Name	Signature
Name	Signature
Name	Signature

CERTIFICATE FROM DISSERTATION ADVISORY COMMITTEE

This is to certify that **Dr Fajr Shah**, a graduate student of the **Post Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision.

She is submitting this dissertation titled **"Assessment of Disaster Preparedness in Government Health Facilities measured by Functional Capacity : A Comparison between Udaipur and Banswara Districts (Rajasthan)**" in partial fulfillment of the requirements for the award of the Post Graduate Diploma in Health and Hospital Management.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been produced from any other dissertation, monograph, report or book.

Dr Nitish Dogra
Internal Mentor
Associate Professor
IIHMR
Delhi

Dr Himanshu Bhushan
External Mentor
Advisor, PHA
NHSRC
New Delhi

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr Fajr Shah**, student of Post Graduate Diploma in Health and Hospital Management (PGDHM) from International Institute of Health Management Research, New Delhi has successfully completed training at NHSRC, Udaipur, Rajasthan from 01 Feb to 30 Apr 2019.

During her tenure with the organization she has successfully completed her project on the topic **"Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan)"**

During the tenure of her association with the organization, I found her sincere, hardworking and focused in the tasks and assignments allotted to her. Throughout the training she was found to be a keen learner and her performance was found to be excellent.

I wish her all success and the very best in all her future endeavours,

Dr Himanshu Bhushan
Advisor, PHA
NHSRC
New Delhi

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan)"**and submitted by Dr Fajr Shah Enrollment No. **PG/17/018** under the supervision of **Dr Nitish Dogra**, Associate Professor, Internal Mentor, IIHMR, Delhi for the award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from **01 February to 30 April 2019** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

(Dr Fajr Shah)
PG/17/018

FEEDBACK FORM

Name of the Student : Dr Fajr Shah

Dissertation Organization : NHSRC, Udaipur, Rajasthan

Area of Dissertation : "Assessment of Disaster Preparedness in Government Health Facilities Measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan)"

Attendance : 100 %

Objectives Achieved : Yes

Deliverables : All Met

Strengths : Time management, sincerity, focus towards task assigned and communication skills

Suggestions for Improvement : Health Informatics and Digital Technology

Suggestions for Institute : Nil

(Signature)

Dr Himanshu Bhushan
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The achievement of my research would never have happened without the cooperation, support and guidance of many people who contributed to my valuable experience.

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LIST OF APPENDICES

ACRONYMS / ABBREVIATIONS

1. **NHSRC** - National Health System Resource Centre
2. **NRHM** - National Rural Health Mission
3. **MoHFW** - Ministry of Health & Family Welfare
4. **EMS** - Emergency Medical Services
5. **NHM** - National Health Mission
6. **IFT** – Inter facility Transfer
7. **GIS** - Geographic Information System
8. **EMT** - Emergency Medical Technician
9. **SPSS** - Statistical Package for the Social Sciences
10. **SRT** - Site Response Time
11. **DRR**- Disaster Risk Reduction
12. **WHO-** World Health Organisation
13. **HIS** - Hospital Safety Index
14. **DH** – District Hospital
15. **CHC** – Community Health Centre
16. **DM**- Disaster Management
17. **HRVCA** -Hazard, Risk and Vulnerability and Capacity Analysis
18. **SDRN** - State Disaster Resource Network

SECTION 1: OVERVIEW

INTERNSHIP REPORT

SECTION 1: OVERVIEW

INTERNSHIP REPORT

(01 Feb - 30 Apr 2019)

Organization Profile

1. National Health Systems Resource Centre (NHSRC) has been set up under the National Rural Health Mission (NRHM) of Government of India to serve as an apex body for technical assistance.

2. Established in 2006, the National Health Systems Resource Centre's mandate is to assist in policy and strategy development in the provision and mobilization of technical assistance to the states and in capacity building for the Ministry of Health and Family Welfare (MoHFW) at the Centre and in the states. The goal of this institution is to improve health outcomes by facilitating governance reform, health systems innovations and improved information sharing among all stake holders at the national, state, district and sub-district levels through specific capacity development and convergence models.

3. It has a 23 member Governing Board, chaired by the Secretary, MoHFW, Government of India with the Mission Director, NRHM as the Vice Chairperson of the board and the Chairperson of its Executive Committee. Of the 23 members, 14 are ex-officio senior health administrators, four from the states. Nine are public health experts, from academics and Management Experts. The Executive Director, NHSRC is the Member Secretary of both the board and the Executive Committee. NHSRC's annual governing board meet sanctions its work agenda and its budget.

4. The NHSRC currently consists of seven divisions – Community Processes, Public Health Planning, Human Resources for Health, Quality Improvement in Healthcare, Healthcare Financing, Healthcare Technology and Public Health Administration.

5. The NHSRC has a regional office in the north-east region of India. The North East Regional Resource Centre (NE RRC) has functional autonomy and implements a similar range of activities.

Vision

6. They are committed to facilitate the attainment of universal access to equitable, affordable and quality healthcare, which is accountable and responsive to the needs of the people of India.

Mission

7. To provide Technical support and capacity building for strengthening public health systems in India.

Policy Statement

8. NHSRC is committed to lead as professionally managed technical support organization to strengthen public health system and facilitate creative and innovative solutions to address the challenges that this task faces.

9. In the above process, they intend to build extensive partnerships and network with all those organizations and individuals who share the common values of health equity, decentralization and quality of care to achieve its goals.

10. NHSRC is set to provide the knowledge-centre technical support by continually improving its processes, people and management practices.

Governing Board

11. Chairperson- Ms Preeti Sudan, Secretary, Department of Health & Family Welfare.

12. Vice Chairperson - Shri Manoj Jhalani, Additional Secretary & Mission Director (NHM), D/H & FW, Ministry of Health & Family Welfare.

13. **Members**

(a) Dr. S Venkatesh, DGHS, Ministry of Health and Family Welfare.
(b) Dr. R K Vats, Additional Secretary & Financial Advisor, D/H&FW.
(c) Prof. Balram Bhargava, Secretary, Department of Health Research.
(d) Dr. Manohar Agnani,Joint Secretary (Policy),MoHFW.
(e) Ms. Preeti Pant,Joint Secretary, Urban Health, MoH & FW.
(f) Ms. Vandana Gurnani**,** Joint Secretary (RCH), D/H & FW.
(g) Prof. J.K. Das, Designation: Director, NIHFW.

(h) Mrs .Gauri Singh, Principal Secretary (Health), Gov.of Madhya Pradesh.

(i) Shri Samir Kumar Sinha, Principal Secretary (Health),Govt. of Assam.

(j) Shri Prabodh Saxena**,** Principal Secretary (Health),Govt. of Himachal Pradesh.

(k) Smt. Poonam Malakondaiah**,** Principal Secretary (H& FW),Govt. of AP.

(l) Dr. Devadasan N, Director, Institute of Public health Bangalore.

(m) T. Sundararajan, Dean, School of Health Systems Studies.

(n) Professor Gautam Sen, Chairman and Founder Health spring, Mumbai.

(o) Indrani Gupta**,** Professor, Institute of Economic Growth, University Enclave, University of Delhi(North Campus).

(p) Prof.Sunil Maheshwari**,** Chairperson (AHRD), IIM Ahmedabad

(q) Dr.Sundar Ravindran**,** Professor, Achutha Menon Center for HS Studies,

(r) Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum.

(s) Prof. Lipika Nanda ,Director, Indian Institute of Public Health Bhubaneswar.

(t) Dr. Anand Krishnan, Professor, Centre For Community Medicine AIIMS.

(u) Ms. Sujatha Rao, Former Secretary, Department of Health & FW,GOI.

14. Member Secretary- Dr Rajani R. Ved,Executive Director, National Health Systems Resource Centre.

15. **Divisions**

(a) Community Processes.

(b) Public Health Planning.

(c) Human Resources for Health.

(d) Quality Improvement in Healthcare.

(e) Healthcare Financing.

(f) Healthcare Technology.

(g) Health Informatics.

(h) Public Health Administration.

Public Health Administration

16. The implementation framework and plan of action of NRHM emphasize making the public health delivery system fully functional and accountable so that health indicators improve. The state capacity to plan, and implement the plan is limited, especially in the high focus states of Bihar and UP that are expected to benefit the most from NRHM. PHA division supports the high focus states, especially Bihar in planning and implementing the state plans.

17. The Division responds to requests from the state or center. This division also helps with development of guidelines, pursuant administrative orders to support implementation and is responsive to requests for assistance from the division of MoHFW, Government of India.

18. During the Internship period I was attached with the NHSRC, Udaipur, Rajasthan. I undertook a study on "Assessment of Disaster Preparedness in Government Health Facilities measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan)" between 01 Feb to 30 Apr 2019. Respondents in terms of assessment of the government health facilities using WHO Check List duly modified with thrust on Functional Capacity was used for analysis of ibid study.

Recommendations

19. The recommendations based on the general analysis of data and observations during my internship during aforesaid duration will go a long way in improving the government health facilities based on their functional capacity in the districts of Udaipur and Rajasthan. Few recommendations are as under:-

(a) Organisation of disaster committee and emergency operation centre to be made more effective and responsive.

(b) Operational plans for internal and external disasters be reviewed periodically and made up to date with regular practice and rehearsals at appropriate levels.

(c) Contingency plans for medical treatment during disasters should be ready at all times.

(d) Plans for operation, maintenance and restoration of critical services is essential to ensure high degree of functional capacity.

(e) Adequate availability of medicines, supplies, instruments and other equipment required during emergencies be catered for by the government health care facilities.

(f) There needs to be concerted efforts made by the authorities concerned to make their level of preparedness and safety plans more effective and responsive.

(g) Operational and functional resilience of hospitals to be addressed properly.

SECTION 2: DISSERTATION

"ASSESSMENT OF DISASTER PREPAREDNESS IN GOVERNMENT HEALTH FACILITIES MEASURED BY FUNCTIONAL CAPACITY: A COMPARISON BETWEEN UDAIPUR AND BANSWARA DISTRICTS (RAJASTHAN)"

CHAPTER 1: INTRODUCTION

20. India is the seventh largest county of the world with the total geographical area of 3,287,240 sq. km. Such a large and diverse geo-climatic condition makes India highly vulnerable to different natural disasters. India is highly vulnerable to earthquake, drought, flood, cyclone, landslide and avalanche. 68% of cultivable land mass is prone to drought, 60% is vulnerable to earthquake, 12% of the total area is prone to floods and 8% of the land is susceptible to cyclone. Changing climatic conditions, over exploitation of natural resources and unplanned urbanisation are adding on to the increasing frequency of natural disasters. A large population (more than 400 million) of poor with their multiple vulnerabilities accounts for India's third rank in terms of victims of natural disasters.

21. Hospitals (Health Care Facilities) constitute a part of critical lifeline infrastructure in the context of disasters. A safe and resilient hospital (Health Care Facilities) not only ensures an effective healthcare response during disasters but also ensures the safety of the patients already being treated in those hospitals before, during and after disasters.

22. This calls for high order of preparedness in the hospital (Health Care Facilities) in order to deal with disaster related emergencies with mass casualties and the resultant need for hospital space, staff and resources at various levels based on their functional capacity. Though as mandated by the DM Act 2005 every hospital is required to have an emergency plan in place but the past incidents like fire accidents in the AMRI hospital in recent past raises a question on the effectiveness of the disaster preparedness plan. The past experience also suggests that the plans available at the hospital are both not frequently updated and shared with the entire staff or/and there are no regular mock drills to carry out periodic preparedness checks or both. The field data collected during the study from the government health care facilities in Udaipur and Banswara District, Rajasthan suggested that there needs to be concerted efforts made by the authorities concerned to make their level of preparedness and safety plans more effective and responsive.

23. **Key Concepts**

(a) **Disaster**: A disaster occurs when a natural event coincides with vulnerable human conditions and with insufficient capacities of the affected community to reduce the adverse impacts of the event. It is a sudden, calamitous event that disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources.

(b) **Hazard** A dangerous phenomenon, substance, human activity, or condition that may cause loss of life, injury or other health impacts, damage to property, loss of livelihoods and services, social and economic disruption, or environmental damage. There are a number of different types of hazards, such as natural and human-induced hazards. It is important to differentiate between primary and secondary hazards. A secondary hazard would be the direct result of a primary hazard. For example, an earthquake can cause a landslide or tsunami.

(c) **Vulnerability** The characteristics and circumstances of a person, community, system, or asset that make it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, social, economic, political, and environmental factors. Vulnerability varies significantly within a community and over time. Vulnerability is a condition that makes a community weak and susceptible to the impacts of a hazard.

(d) **Risk** The combination of the probability of an event and its negative consequences often referred to by the function: Disaster risk = (Hazard x Vulnerability)/ Capacity.

(e) **Disaster Risk Reduction** The concept and practice of reducing disaster risks (DRR) through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, decreased vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

24. **Hospitals (Health Care Facilities) and Disasters**. Disasters have an uncanny ability to bring to the forefront vulnerabilities of systems, structures, processes and people which in turn cause large scale damages; and hospitals are no exception in this matter. In the last two decades, countries across the world have suffered a huge loss of confidence, as well as economic losses on account of damages incurred by hospitals from disasters.

25. In India, experiences from the Gujarat earthquake of 2001, the Indian Ocean Tsunami of 2004 and the Kashmir Earthquake of 2005 have shown that disasters affect not only the population but also health facilities. Particularly when the Children"s Hospital in Jammu collapsed and in the city of Bhuj, where thousands of people died and the civil hospital was reduced to a heap of debris when it was needed most. And more recently the fire in AMRI Hospital in Kolkata where more than 90 people died, reminded us that it is not simply the structural resilience but also **operational and functional resilience** of hospitals that **need to be addressed**, if we wish to reduce the impact of disasters on hospitals(Health Care Facilities). Both these instances of the hospitals collapsing in Bhuj and the fire in AMRI Hospital in Kolkata, provided evidence based lessons of the underlying vulnerabilities that cause hospitals to get affected by disasters, which may be broadly grouped as follows:

(a) Inadequate or complete non-compliance of structural elements of hospitals to building codes and other safety norms which result in the failure of hospital structures and their component non-structural elements.

(b) Absence of a documented Hospital Disaster Management Plan.

(c) Lack of planning and preparedness to respond to disasters.

(d) Inadequate or complete lack of internal and external communication.

(e) Lack of networking amongst hospitals.

26. The health impact of hospitals (Health Care Facilities) being affected by disasters include, other than the very obvious lapses in medical care that hospitals (Health Care Facilities) provide to victims of a disaster, lapses in preventive medicine and public health response. The social impact of hospitals being affected by disasters include a loss of confidence/morale in the affected community which can affect the long-term recovery and sense of well-being of the community The economic impact of hospitals (Health Care Facilities) being affected by disasters is a little more obvious, given the enormous investments required to be made to construct hospitals and the expensive equipment that is lost when disasters strike hospitals. Even the use of temporary field hospitals as a contingency measure is economically unviable. It is an attested fact that the costs involved to mitigate and prepare hospitals for disasters are far less than those required for re-building hospitals after they have been damaged by disasters.

27. **Expected Disaster Scenarios For Hospitals** Hospitals (Health Care Facilities) may face both internal and external disasters. The impact of internal disasters such as a fire, hazardous material exposure, utility failures, etc., is typically limited to the hospital/healthcare

facility while external disasters include scenarios such as earthquakes, mass casualty events or epidemics where the hospital itself may or may not be affected but is a critical part of the larger response. As such three scenarios can be expected when disasters strike. They are as follows:

(a) **Community Affected – Hospital Unaffected**: During such scenarios, hospitals play a vital role in the larger disaster response being undertaken. For hospitals such scenarios would imply a sudden increase in demand because of the surge in the number of patients seeking medical attention. There is a possibility of the hospital facility getting overwhelmed if adequate preparedness and response mechanisms are not swung into action as soon as the disaster occurs.

(b) **Community Unaffected – Hospital Affected**: Such scenarios arise from the internal disasters of hospitals. As such, partial or complete evacuation and transfer of critical patients to networked hospitals is the key to successful response. Such scenarios also demand a high degree of preparedness on the side of the hospital administration and staff, as well as a speedy response from the surrounding community and hospitals.

(c) **Community Affected – Hospital Affected:** Such situations exacerbate the challenge posed to hospitals, as they not only need to cater to the existing demand on their facilities but also need to address the sudden increase in demand on their facilities because of the surrounding community being affected by a disasters. In such situations the hospitals may even find themselves facing the added challenges of loss of essential services, like water supply, electricity, medical gases, etc. and a reduction in man-power.

28. Hence, the only rational manner in which hospitals (Health Care Facilities) can be prepared for disasters is by increasing their resilience and reduce their vulnerability by strengthening both structural and operational including their functional capacity aspects of the hospital (Health Care Facilities), such that they achieve a reasonable degree of safety.

29. **Safe Hospitals (Health Care Facilities)** The Pan American Health Organization (PAHO) and the World Health Organisation (WHO) have defined: “a Safe Hospital as one that will not collapse in disasters, killing patients and staff, can continue to function and provide its services as a critical community facility when it is most needed and is organised, with contingency plans in place and health workforce trained to keep the network operational.”. The concept of safe hospitals does not merely refer to the physical and functional integrity of health facilities but also the preparation to function at full capacity and cater to the needs of the affected community immediately after disaster strikes. Thus, making hospitals safe involves

understanding and mitigating factors that contribute to their vulnerability during an emergency or disaster such as the building's location, design specifications and materials used, damage due to non-structural elements, untrained professionals and lack of basic understanding of disaster management.

30. Lifelines such as electricity, water and sanitation and waste treatment and disposal of medical wastes are important to ensure continuity of operations during an emergency situation. The importance of hospitals and all types of health facilities extend beyond the direct life-saving role they play.

CHAPTER 2 : REVIEW OF LITERATURE

31. Hospitals are expected to continue to provide medical care during disasters. However, they often fail to function under these circumstances. Vulnerability to disasters has been shown to be related to the socioeconomic level of a country. Hospital safety is of great social importance in various aspects, including functional safety. If hospitals fail to response appropriately to a disaster or protect people against the risks resulting from natural and man-made disasters, people feel insecure and society loses the stability situation. Disasters are unavoidable conditions and their destructive effects can lead to the inability of the community to meet their needs and access to health care. The severity of disasters is increasing worldwide and resulting in the prevalence of deaths and diseases as well as rising economic costs .India is ranked 77 in terms of disaster occurrence in Asia. Research shows that when a disaster occurs, the pick of medical care needs is within the first 24 hours after the disaster, and 85-95% of the survivals are rescued within first 24 hours Therefore, in times of crisis, hospitals need to increase their capacity for admission. Medical disaster refers to human response to unexpected catastrophes aimed at reducing deaths an injuries .In the last decade, the medical response focused on hospital care such as discharge, triage, and transmission without the need for hospital treatment. Certainly, health sectors play the main role in crisis management by providing preparedness plans and crisis response strategies, which can have a significant impact on reducing casualties. The health sector should be prepared before the crisis to provide health care at the best possible time with adequate and prompt action.

32. Safe hospitals (Health Care Facility) are vital to saving lives, providing care during emergencies, and aiding community recovery. In many countries, hospitals are the last shelter for disaster victims seeking refuge and the care they desperately need. Hospital systems also represent a major investment – up to 70% of the ministry of health budget – and are an icon of social well-being. Losing a hospital may result in a loss of security, connectivity and trust in local authorities. Yet the record shows that health facilities and health workers are among the major casualties of emergencies, disasters and other crises. Government agencies (including ministries of health and national disaster management organizations), public and private hospitals and their partners have taken action to ensure the safety and preparedness of hospitals, so that they are able to continue to deliver essential services in emergencies and disasters. In this respect, WHO has been promoting safe hospitals programmes for more than 25 years, resulting in global, regional and national policy commitments, technical guidance and support

provided to countries and partner organizations across WHO's six regions. Seventy-seven countries across the world have reported to WHO that they are implementing Safe Hospital (Health Care Facility) activities.

33. The Hospital Safety Index tool of WHO has been used to assess the safety and preparedness of more than 3500 health facilities, and action has been taken to implement the assessment's recommendations for making hospitals safer and better prepared for emergencies. Many training programmes have been conducted by various organizations to increase the capacity of hospital staff to prepare for and respond to internal and external emergencies. In recent years, increasing attention has been given to the sustainability and energy efficiency of "smart" or "green" hospitals.

34. **The breakdown of the hospital's functional capacity to respond to emergencies and disasters is the main cause of service interruption in hospitals in such events;** only a small proportion of hospitals are put out of service because of structural damage. The measures to prevent disruption of a hospital's functionality, including critical systems, supplies, and emergency and disaster management capacities, require much less of an investment than preventing a building's collapse. However, the technology, policy and management of hospital building performance in disasters continue to be major challenge .When maintenance is neglected, systems that are critical for the functioning of the hospital deteriorate over time.

35. However, the vulnerability of health care facilities can be reversed through sustained political and financial support, as has been shown in a variety of projects in many countries. In designing new safe hospitals (Health Care Facility) or taking measures to improve the safety of existing hospitals, there are four objectives:

(a) Enable hospitals to continue to function and provide appropriate and sustained levels of healthcare during and following emergencies and disasters

(b) Protect health workers, patients and families

(c) Protect the physical integrity of hospital buildings, equipment and critical hospital systems

(d) Make hospitals safe and resilient to future risks, including climate change.

36. The aim of Safe Hospitals programme is to ensure that health facilities will not only remain standing in case of emergencies and disasters, but that they will function effectively and without interruption. Emergencies and disasters require an increase in treatment capacity, and the hospital must be ready for optimal use of its existing resources. The hospital must also

ensure that trained personnel are available to provide high quality, compassionate and equitable treatment for casualties and survivors of emergencies, disasters and other crises.

37. The effects of various disasters on health depend on the type of disaster and the time of its onset. Sudden onset disasters such as earthquakes pose greater threats to health than slow onset disasters. The actual and potential health problems resulting from the disaster are multifaceted and do not all occur at the same time. The resulting health problems might be related to food and nutrition, water and sanitation, mental health, climatic exposure and shelter, communicable diseases, health infrastructure and population displacement.

38. Disasters, whether natural or human-made, create particular problems for health services. Damage to health infrastructure can be summarised as follows:

(a) Disasters can cause serious damage to health facilities, water supplies and sewage systems. The damage can severely limit health systems' provision of medical care to the population in the time of the greatest immediate need. Structural damage to facilities poses a risk for both health care workers and patients.

(b) The supply chain (medical equipment and pharmaceutical supplies) for the health facilities is often temporarily disrupted.

(c) Limited road access makes it difficult for disaster victims to reach health care centres. Relief organisation might also have difficulties reaching vulnerable population.

(d) Pre-hospital coordination and communication is crucial in emergency situations. Disrupted communication systems lead to a poor understanding of the actual capacity of various receiving facilities, military resources and relief organisations. Consequently, the already limited resources are not effectively utilised to meet the demands.

(e) Increased demands for medical attention.

(f) Population displacement: A mass exodus from the emergency site places additional stress and demands on the hospitals including staff, facilities and health services. Depending on the size of the migrant population, the host facilities may not be able to cope with the new burden, and o Mass migration can introduce new diseases into the host community.

(g) Major outbreaks of communicable diseases: While natural disasters do not always lead to massive infectious disease outbreaks, they do increase the risk of disease transmission. The disruption of sanitation services and the failure to restore public health programmes combined with the population density and displacement, all culminate in an increased risk for disease outbreaks.

39. The purpose of a preparedness plan is to respond effectively to events that pose an immediate threat to the health and safety of patients, staff, and visitors. The plan should consist of a number of procedures designed to respond to those situations most likely to disrupt the normal operations of the hospital and return the hospital to a normal status. A hospital disaster preparedness plan is meant to be an all hazards plan and is designed for each emergency identified in the hazards, risk and vulnerability analysis that could impact the operation of the hospital. The hospital disaster preparedness plan is developed to assure availability of resources for the continuation of patient care during an emergency. Hazard, Risk and Vulnerability and Capacity Analysis (HRVCA) exercise has to be carried out as an input into the planning process. This will help assess the impact of likely emergencies to be used as a guide to the development of the plan.

40. An effective disaster management plan should include the following elements:

(a) Emergency Response Plans: Emergency Response Plans are developed and maintained for each of the emergencies identified as priorities in the HRVA.

(b) Management Plan: Management plan should describe the processes it implements to effectively manage emergencies affecting the facility, patients, staff, and to respond to emergencies in the community that cause an influx of patients. This Plan should be evaluated annually, and changed as necessary, based on changes in conditions, regulations and standards, and identified needs.

(c) Mitigation, Preparedness and Recovery Plans: Emergency Response Plans should include the activity designed to mitigate the impact of the emergency, such as building elements, and specialised equipment, and to prepare for the emergency with activities including staff training, adequate supplies, and equipment for responding the potential emergency, and plans to handle the space and facilities during emergency situations.

41. The Emergency Response Plans should include the specifics of the response, including job assignments, staffing strategies and the management of patients, both victims of the emergency and existing patients. The plans for recovery should include the immediate cessation of the emergency plans, and return to normal operations, critique and evaluation of the response to the plans, and changes to the plans to improve them. Recovery plans for incidents that directly affect the hospital facility should be done as quickly as practical after the event, and should include the interim measures to provide for ongoing patient care.

42. **Processes for Implementing the Plans, and Recovery Processes**. The plan should clearly state the criteria for, and the processes to initiate the plan and how the plan will be implemented. The criteria should include example of the conditions that indicate the plan should be activated, the individual(s) responsible for initiation of the plan, and the use of the command structure to manage the emergency. The plan should also include the response elements for staff and facility use. The plan should define when the plan should be terminated, and the transition back to normal, including recovery elements such as capture of medical record information, financial information, and restoration of areas modified for the emergency use, and return to normal management processes.

43. **Processes to Notify Staff of Emergency Implementation.** When emergency plans are implemented, a number of methods should be used to notify affected staff. Primary within the hospital can be the audible page system, used to announce codes to alert the staff to the emergency. In addition, communications tools such as telephones and pagers should be used to assure key staff are aware of the situation. For notifying staff away from the facility, telephones, cell phones, and radio pagers should be used.

44. **Notifying Governmental Authorities** The plan should include a current list of governmental and commercial organisations that must be notified to effectively implement the plan.

45. **Management of Patient Care Activity** The hospital disaster preparedness plan should address the management of patient care activities. The plan should include procedures for discontinuation of elective treatment, for evaluation of patients for movement to other units, release to home or transfer to other facilities as space is needed. The plan also includes procedures for the management of information about incoming patients and about current patients for planning, patient management, and informing relatives and other; and for transport of patients.

46. **Relocation and Evacuation of the Facility** A facility evacuation plan should be in place and can be implemented in phases. Relocation of staff away from the area of emergency may be undertaken by staff on the spot, moving to areas in adjacent zones. A full evacuation should be implemented if the impact of an emergency renders the hospital inoperable or unsafe for occupancy.

47. **Annual Review of Management Plans** The plan should be evaluated on an ongoing basis at least annually. The appraisal should identify components of the program that need to be instituted, revised or deleted.

48. **Evaluating Safety of Hospitals(Health Care Facility)** The Hyogo Framework for Action calls to "Integrate disaster risk reduction into the health sector… and implement mitigation measures to reinforce existing health facilities, particularly those providing primary health care". [i]As one of the priorities at the national and local levels, the Sendai Framework for Disaster Risk Reduction 2015-2030 recommends "To enhance the resilience of national health systems, by integrating disaster risk management into primary, secondary and tertiary health care, especially at the local level".[ii] It is the job of local governments to provide essential services to their citizens and communities, such as health care, which need to be resilient to disasters.[iii]

49. Although the largest number of patients receive their regular care at the primary level, there is no internationally validated tool for the rapid safety assessment of community or primary health care centers (PHC).[iv]

50. Different scientists and organizations have put an effort to develop assessment methods to facilitate the identification and management of weaknesses in hospital disaster preparedness. Higgins et al. (2004) assessed preparedness of hospitals in Kentucky (USA) using an instrument based on the Mass Casualty Disaster Plan Checklist. [v]Adini et al. (2006) analyzed various models for assessing the emergency preparedness of hospitals in mass casualty incidents. A comparison of an on-site survey, directly observed drill performance, and video analysiss of teamwork was done in Los Angeles County hospitals by Kaji et al (2008). [vi]Lazar et al. (2009) endorse the use of measurable, evidence-base benchmarks and objective standards in hospital emergency management. Top et al. (2010) examined the disaster plans of hospitals throughout Turkey using this method to estimate the preparedness for possible disasters.[vii]

51. The World Health Organization has promoted some plans for safer hospitals at local and national levels to strengthen hospitals in response to emergency situations. As well, in order to help hospital managers for assessing functional safety of hospitals and improving their readiness to respond to emergencies, WHO has prepared checklists to assess the capacity of the health system in a crisis situation. Of the most important activities in the field of healthcare is the risk analysis and assessment of disaster risk in **all structural, non-structural, and functional aspects** of hospitals and health centers and reduction of their liability through

identifying and assessing the vulnerabilities and their correction. World Health Organization (WHO) has developed the Hospital Safety Index (HSI), which is a validated, international, multi-risk assessment tool which allows for standardized comparisons of hospital safety levels.[viii] The HSI has been used to assess hospital safety around the world, and studies evaluating up to several hundred hospitals have been published. In Italy, Aiello et al. (2012) developed a simplified methodology based on the HSI to map the seismic risk for hospital buildings taking into account the specific national features, while Miniati and Iasio (2014) proposed a methodology which considered the complexity of the hospital system while leveraging the rapid assessment provided by the WHO evaluation forms, and applied it to 5 most important hospitals in the Province of Florence in the scenarios of earthquakes and floods.[ix] The preparation to care for populations with chronic health conditions during disasters has been identified as a key issue in disaster preparedness.

52. **Hospital Safety Index** The Hospital Safety Index (HSI) is a tool for rapid, reliable and cost-effective diagnostic of the structural safety, non-structural safety and functional capacity of a hospital in 151 areas [12]. The 151 variable, each with three safety levels (Low = "Unlikely to function", Average = "Likely to function", and High = "Highly likely to function") are divided into four sections/modules: geographic location of the hospital, structural safety, non structural safety, emergency and disaster management. Its origins begin with efforts from the Pan American Health Organization (PAHO) and the Latin America countries, but its reach has spread, and the HSI was applied extensively in other regions (including Europe) after the global campaign for hospitals safe from disasters. [x]Calculating the safety score allows the hospital to establish maintenance and monitoring routines and consider various necessary measures to improve safety in the medium term. The total score for the healthcare facility can be in one of the three classifications regarding safety: • Classification A: Considered to be able to safely continue their activities in case of disasters (safety index 0.66-1.00) • Classification B: Considered to be able to resist against a crisis, but their equipment and vital services are exposed to danger (safety index 0.36-0.65) • Classification C: Considered to be unsafe for people working there and patients in crisis, requiring urgent intervention measures (safety index 0.00-0.35).

53. **Structural Indicators of Safe Hospital** Structural elements are essential in health facilities that determine the overall safety of the building.

54. **Non-Structural Indicators of Safe Hospitals**: All other elements without forming part of the resistance systems, enable the hospitals to operate. Such as: architectural elements, equipment, contents and services or lifelines are called the non-structural elements.

55. **Functional Indicators of Safe Hospitals**: It is very important that hospitals and health facilities during emergency or disaster are functioning well. Therefore it is necessary to ensure that health services will continue to be provided when they are most needed. The following groups are functional indicators.

(a) Hospital Location and Areas: The location of the health facility is vital. It must be away from hazard, dust, noise and fire. Therefore it must be easy to reach from all zones.

(b) Site and Accessibility: The hospital or health facility location should be near proper roads and with enough ways of transportation. It must be easy to reach and near educational, religious and commercial centers.

(c) Zoning of hospital units: A well distribution of departments within the hospital or health facility will make accessibility to them be easily and safely reaches

(d) Maintenance of Utilities It is vital in the daily operations of hospitals and health facilities to have adequate water supply, electricity and medical gases.

56. **Surge Capacity** Surge capacity is the capability of a hospital to expand its resources to meet a large casualty load without requiring outside help, this is also a function of both space equipment and staff. The most important components are;

(a) Staff: It refers to doctors, nurses, mental health staff, emergency medical technicians and public health professionals. Hospitals have specific benchmarks for surge capacity staffing and states should create a response system that allow for this .Health professionals are trained via methods of competency based education, in the recognition, treatment and referral of patients exhibiting behavioural health consequences related to any type of public health emergencies:

(b) Stuff: This consists of equipment, supplies and medications that should be available on hand for use in major emergencies to keep facilities in constant

and effective operation and support proper patient care, including specialized items for specific threats Stockpiles to help provide medical and non-medical supplies during an emergency.

(c) Structures: In case of emergency, hospitals must have enough places to convert to patients locations and can increase bed capacity There must be emergency plans in the hospital to supply extra location, food and staff. Dead bodies' location must be far away from the entrance of the hospital and an alternative morgue place must be available to face extra demand in disaster

(d) Emergency and Disaster Plan Hospital Emergency Preparedness Response and Recovery Plan must be prepared and well tested and exercised in the hospital. disaster plan should also be provided for the continued functioning of the public information center during disaster/emergency situations ,Public education should ideally become part of the hospital's disaster plan.

(e) Update list for Staff; updated list of addresses and telephone numbers of all staff involved in the emergency preparedness plan should be done on frequent basis and periodically, for example say every 3 months.

(f) Medical records; a question Should be asked; if patient medical records and billing records were destroyed, is there then some type of backup system for them? Another question that arises is: Where is the information stored and can it be easily accessed? You may want to consider keeping a backup tape or disk off-site. Paper records; to help protect paper records, you may want to look into fireproof cabinets. Even though this may be expensive, they may help in preserving much needed records.

(g) Committee: Each hospital should have a disaster committee from multi-disciplinary. Their task is to make a disaster procedure, and to also organize exercise, and to function as troubleshooters when the hazard/disaster becomes real, in addition to co-ordinate with external parties concerned and to manage inventory risks.

57. **Preparedness:** External and internal disaster preparedness; The hospital should always be prepared with written disaster plan that responds to external disasters to help in providing assistance to victims, the hospital is also vulnerable to disasters directly occurring within its walls; so preparation must be made in response to internal disasters, the most common of all is fire. Strengthen essential hospital services; intensive care resources must function well and in a high quality in case of mass casualty incident (MCI) despite number of injuries. Thus, the hazard plan must have certain actions that will to be taken before, during, and after a disaster in

the hospital's emergency room, intensive care unit, sterilization unit and operating theatre. Education and training; education and training are both important and essential for disaster, and also for disaster services. Good planning and equipment may be of little or no use if the staff has not received appropriate instruction in the function of organization or use of the equipment. Emergency Exercises; the hospital emergency response plan is a guideline of practices that must be done, developed and exercised during disaster event. It is a pre-requisite for applying emergency practices.

58. JCAHO requires drills and exercises twice yearly both internal and external. Hospital evacuation plan; a proper plan that explain clearly how to evacuate people and things inside the hospital must be available and practiced regularly. Contingency plans for medical treatment in disasters; Emergency and disaster plan should include contingency plan for special hazards that hospitals are subject to such as: floods, fires and explosion, chemical accidents or exposure to ionizing radiation, pathogens with epidemic potential, psycho-social treatment for patients, families, and health workers. Community Involvement; Community disaster plan must be properly prepared. A special attention must be taken in developing countries due to bad communication and transportation. Patients are difficult to reach hospital in normal cases. Thus the difficulty to arrive health facilities increases in case of disaster. So more effort should be done to exercise such people in these difficult areas.

59. **The Hospital Emergency Incident Command System (HEICS)**: HEICS is a management structure to identify responsibilities, reporting connections, and a common designation to help combine hospitals with other emergency responders Job descriptions assigned for each functional position within the HEICS must be printed in the job action sheets. The job action sheets must identify the responsible person, clarify the actions that needed to be done and assign reporting to whom.

60. **Stage Of Activation**: in case of disaster in the hospital; emergency notification then activation of the chain of command must be both known and performed. After this the operational phase is performed by actual dealing with the mass casualties according to the disaster emergency plan. Then phase of deactivation is declared when hospital command is satisfied that flow of victims is not exceeding the hospital utilities. Emergency Operations Centre (command center): a pre-determined location should be chosen for the Emergency Operations Centre (EOC), the functions of the EOC include, Activation of the plan by the designated persons; Control and coordination of hospital activities; Provision of additional resources; Liaison with the overall emergency control center and Control of field medical

services, Surveillance system: both knowledge and the use of epidemiological tools should exist, including routine surveillance systems and disease-reporting procedures. Computer-based surveillance systems should be created to collect and analyze the morbidity, mortality and other epidemiological data for early detection of bioterrorism-related diseases. This means early and quick detection of typical deaths or syndromes and early and quick detection of the increase of typical deaths or syndromes above the expected levels. [xi]

61. **Control of Communication and Coordination Transportation and communication;** communication is vital to the success of all coordination efforts. Planning for disaster situations should also entail pooling of available resources for patient transportation. Identifying the availability and capabilities of ambulances is important in maximizing their use during emergencies. Cooperative arrangement with local emergency plan; because hospitals do not function in isolation during a disaster, it is essential for emergency medical services (EMS) and hospital disaster plans to be integrated into the community disaster plan Referral procedure; hospitals needs special Mechanism during disaster to prepare a census of admitted patients and those referred to other hospitals . Hospital facility networking; the connection between different health care facilities of a certain geographical zone must be available to know the resources. Hence, authorities must have the information about the available health resources in their zone. Information, materials, manpower and training must be networked in the health care facilities.

62. Hospitals play important roles in both predictable and unpredictable emergencies. In addition, disaster preparedness plan in hospitals requires careful programming. Planning for preparation in disasters demands valid and systematic data of the disaster outcomes and awareness of policymakers of all stages of a disaster. Hospitals as the first line of health care services in disasters must be prepared to deal with them. A precise and effective disaster preparedness for staff of hospitals should be prepared and implemented before the disaster and run continually.

63. Hospital preparedness in disasters should be comprehensive and not to create problems in hospital performance during accidents and disasters. Accordingly, hospitals should be ready with regard to different aspects of their operations before the events occur. Hospital preparedness plan should be compiled and updated based on the type of the event, its probability and topology, how to serve the hospital, human resources, financial resources, equipment and patient admissions. Preparation should be considered in all respects as physical structure, administrative structure, equipment, manpower, and so on.

64. Health facilities play an important role in the socioeconomic and psychological recovery of the population from a disaster and are considered especially important because of their role in saving lives in the affected population. Their role is not only to provide medical care, but also to save patients at the time of disaster. Hospitals, as one kind of health facilities in cities must be able to withstand hazards and must remain functioning. For example, during and after Hurricane Ivan struck the island of Grand Cayman, Cayman Islands Hospital remained functional and provided shelter to more than 1,000 people, as it was built to Category 5 hurricane standards (UNISDR 2012). Damage to these facilities inhibits the relief and recovery operation, as can be seen in the 2011 Great East Japan Earthquake and Tsunami (GEJET) in Tohoku, Japan. The event caused total collapse of 11, and partial collapse of more than 200, hospitals in three prefectures (Iwate, Miyagi, and Fukushima) (World Bank 2012).[xii] The loss of hospital facilities highlights the enormous investments needed for disaster preparedness. Despite the advancement of hospitals around the globe, they often are rendered useless due to structural failures at a time when these critical installations are required to save the lives of people affected by disasters. In the cases where the hospital buildings are structurally safe, capacity to provide assistance during the times of utmost need also is lacking. Reasons may be inadequate beds, lack of medical and support staff, equipment and facilities, or the increased number of patients needing medical attention. It is essential to protect and strengthen these hospitals. Hospitals are often associated with disaster response, yet they have a larger role to play in ensuring the safety of their particularly vulnerable clientele (PAHO/WHO 2005). Kai, Ukai, and Ohta (1994) conducted a study to investigate the adequacy of preparedness in the Osaka Prefecture in Japan and found that of the 265 hospitals surveyed, none could fulfill the criteria for disaster preparedness, which included sufficient electricity, gas, water, food, and medical supplies in the event of a disaster.

65. **The Concept of a Medical Service System for Disaster in Japan** The goal of medical service during an emergency in Japan is to achieve the most effective way of treating large numbers of victims; therefore hospitals need to be well prepared for emergencies such as disasters. Various medical services that have been provided in disaster situation are as follows: Command and Control, Safety, Communication, and Assessment (CCSCA) and Triage: The Command and Control, Safety, Communication, and Assessment (CCSCA) and Triage systems used in Japan in managing medical service during disasters are derived from the Major Incident Medical Management System (MIMMS) (Aitken and Leggat 2012).[xiii] These systems are important due to their relevance in mass casualty and disaster management. The services are

delivered by the emergency departments in hospitals, which are the "front door" of the hospital component of the health system. According to the MIMMS, "command" over the health service resources should be established immediately when an incident has occurred, while "control," as the overall direction of emergency management activities in an emergency situation, should be given equal importance, and "safety" should be treated as a priority in all activities. "Communication" is vital to the successful management of medical and other critical services during disasters. Radios as an alternative form of communication to conventional communication, such as telephone, have been installed in most hospitals in Japan. The "assessment" of hospital emergency preparedness should include multiagency support since external aid is crucial to reducing the inherent delays of service delivery. [xiv]The most commonly used triage method in Japan is the Simple Triage and Rapid Treatment (START) method—a priority-based treatment system used for initial separation of patients based on their physical injuries and conditions. Hub Hospital: A Hub Hospital is a hospital that is prepared for emergency medical treatment in an initial period. These hospitals were designated according to the lessons from the 1995 Hanshin-Awaji Earthquake and are required to:

(a) be ready for response to an emergency 24/7

(b) be capable to receive patients in serious condition by helicopter

(c) have a Disaster Medical Assistant Team (DMAT).

66. According to PAHO/WHO (2012), a "safe hospital" is a facility whose services remain accessible and functioning at maximum capacity and within the same infrastructure immediately following a natural disaster. The Pan American Health Organization (PAHO) and WHO (PAHO/WHO 2008) developed a Hospital Safety Index (HSI), a tool to provide a snapshot of the feasibility that a hospital will continue to function in emergency situations, considering the structural, non structural, functional, and human resources issues, including the environment and health services network to which the hospital belongs. The HSI is an initial step towards prioritizing investments in hospital preparedness. By determining a hospital's safety index, decision makers will have an overall idea of the hospital's ability to respond to major emergencies and disasters, allowing a hospital's level of safety to be monitored over time. The HSI was developed by PAHO's Disaster Mitigation Advisory Group.

67. Public health emergencies and disasters is a sparsely researched subject in India. The majority of publicly available reports look at individual health conditions, impacts from specific disaster events or on evaluating existing policies. Evolution of this research is in relation to

India's evolving policy discourse on disasters which developed further with the occurrence of major disasters. The Odisha Super Cyclone (1999), the Gujarat earthquake (2004) and the Indian Ocean Tsunami (2004) are the most researched subjects for their impact on health. Before the Super Cyclone, there are studies on impacts of vector-borne diseases such as leptospirosis (WHO, 2000), cholera outbreaks and a study on psychiatric disorders in survivors of the 1993 Latur earthquake that killed over 10,000 people.[xv]

68. After 2000, India's ongoing epidemiological transition from communicable to non communicable diseases saw studies emerge on the threat of chronic diseases, cardiovascular diseases, diabetes, cancers, hypertension and an overview of mental health priorities, also reflecting on impacts from disasters. A relevant study on health systems was on the epidemic preparedness in public health that looked at environmental forecasting and disease surveillance methods to promote epidemic prevention control. The Odisha super cyclone, which impacted more than 10,000 people, triggered several studies on mental health vulnerability and post-traumatic stress disorder.

69. **Disaster Management** The governance response to manage natural disasters in India is the Disaster Management Act 2005 (DM Act). Until the early 2000s, the focus of India's disaster management policy was on relief and rescue operations. The role of a healthcare institution in mitigating disaster impact did not receive a clear mandate. The National Disaster Management Authority (NDMA) was formed in 2005 under the Ministry of Home Affairs (MHA) to manage economic, environmental and developmental issues relating to disasters. The years after 2005, the newly formed National Disaster Management Authority (NDMA) published several standards on specific hazards. This included guidelines for minimum standards of relief management of earthquakes, tsunamis, floods, urban floods, cyclones, drought, landslides, nuclear emergency and chemical disasters. These guidelines included a section on medical preparedness and mass casualty management in the case of each of these disasters. NDMA also published comprehensive guidelines on psycho-social health. In 2016, NDMA published guidelines for hospital safety.

70. **Guidelines for Hospital Safety** The DM Act requires state governments to formulate State Disaster Management Plans (SDMPs) which detail how to prepare, mitigate, respond and recover from disasters. A component of these plans is medical preparedness and mass casualty

management. It recommends that State may provide healthcare and services by following the standards laid down by the National Authority. The Act prescribes every hospital to have an emergency plan that must be updated regularly with periodic checks and mock drills. NDMA's hazard specific management guidelines provide details on appropriate medical preparedness and healthcare delivery system to deal with injuries, conditions, and diseases associated with that hazard. It further assigns responsibilities to departments in the state, district, state health departments, private hospitals, and urban local bodies to enable multi-agency collaboration. The NDMA guideline for earthquakes recommends selective seismic strengthening and retrofitting of lifeline structures in earthquake-prone areas. These are applicable for hospitals and health facilities, tertiary care centers and all hospitals designated as major hospitals. It requires them to be updated on the India Disaster Resource Network (IDRN) database. The guidelines for urban flooding recommend involvement of the corporate sector to improve the delivery of relief measures. NDMA published its "minimum standards of relief" for persons affected by disasters including rehabilitation, shelter, food, health, water, sanitation, and vulnerable groups. In 2016, NDMA laid down guidelines for hospital safety to mainstream disaster prevention, mitigation, preparedness and response activities into the health sector (NDMA, 2016). The document brings together from a spectrum of guidelines from national (National Building Code, Bureau of Indian Standards, Clinical Establishment Act, Indian Public Health Standards) and international (Pan American Health Organization, World Health Organization) sources. It empaneled domain experts to further improve upon these guidelines and provides frameworks for implementation. It elaborates in detail on the some of the following parameters for hospitals and disasters.

71. Based on the learnings from the above components, the document lays down a **"National Action Framework for Hospital Safety**". It highlights five priority areas for action along with highlighting gaps, recommending interventions, estimating a timeline and assigning work to requisite agencies. However, in practice, it has been found that there is a gap in compliance to building codes, lack of planning and preparedness and variation in quality of medical facilities. There is no statutory provision to regulate and standardize disaster response plans for hospitals. Hence, hospitals do not maintain disaster management plans. In a survey, it

was found that only 26% of trauma care health facilities had a well-documented disaster management plan. In an onsite survey of primary health facilities in a flood-prone district, it was found that basic response utilities such a power backup, a line of standard operating procedures and equipment were missing. Monitoring these aspects of hospital management is the responsibility of States and administrative units under them.

73. **Health in State Disaster Management Plans (SDMP)** Under the DM Act, each State is required to prepare a State Disaster Management Plan (SDMP) to carry forward national goals for disaster management. The SDMP is expected to cover the state's vulnerabilities, measures for the prevention and mitigation of disasters, capacity building and assignment of responsibilities to relevant departments in the event of a calamity. Hospitals are identified as critical/lifeline facilities. The SDMP document addresses all phases of a disaster (preparedness, mitigation, response). Even though the law requires states to update their plans annually, only 8 states had updated their plans till 2016. Plans dedicate the majority of their sections to respond to a disaster, rather than prepare for one in their Standard Operating Procedures (SOPs)

74. Functional indicators find a mention in 75% of the documents. All states recommend the preparation of a medical preparedness plan, mass casualty management plan and checklists to train health workers for emergencies. A fundamental requirement to enable functional continuity of hospitals during emergencies is a list of all available health facilities and supporting services (such as power station, police station, ambulances). A mere 50% of documents provide any information on health facilities in the state. Assam and Odisha provide details on the population being served. Functional indicators for post-disaster psycho-social support and mental health are missing across documents, except Meghalaya. At least one- third of the survivors of the super-cyclone in the state of Odisha suffered disabling psychiatric symptoms. NDMA has recognized this issue as "a continuum of the interventions in disaster situations" and laid down guidelines on Psycho-social Support and Mental Health Services (PSSMHS) in Disasters (2009). Other indicators such as mobile hospitals, media management, district level data, and Standard Operating Procedures are well addressed. 16 of the 22 states mention utilizing the India Disaster Resource Network (IDRN). It is an online portal that includes data of health professionals and medical equipment to accelerate decision making during a disaster. Assam and Gujarat have established a functional State Disaster Resource Network (SDRN).

CHAPTER 3: AIM AND OBJECTIVES

Aim

75. To assess the level of Disaster Preparedness in Government Health Facilities measured by Functional Capacity: A Comparison between Udaipur and Banswara Districts (Rajasthan).

Objectives of Study

76. The objectives of this study are to analyze the following from the perspective of a health administrator:

(a) To assess and compare the functional safety and capacity status in government health facilities in Udaipur and Banswara in response to disasters.

(b) To identify potential capabilities and recommend safety strategies for health care facilities for making their response effective and efficient in times of emergencies

77. **Expected Outcome of the Study**. The results of this study can provide an insight on the gaps and challenges in Government Health Care facilities in Udaipur and Banswara based on their functional capacity. Post the identification of weaknesses and shortcomings in health care facility, disaster preparedness efforts needs to be put to make them more responsive and effective in times of emergencies. Since largest number of patients receive their regular health care at government heath care facilities, there is an urgent need to validate their disaster preparedness levels based on their functional capacity using WHO guidelines suitably modified. The Hospital Safety Index can be suitably modified and used for comparing the government health care facilities and post disaster risk reduction and rectification measures they are likely to function effectively during disasters

CHAPTER 4: METHODOLOGY

78. Methodology

(a) **Gen**. Hospital affiliation and size, and type of hazards, were compared between two districts of Udaipur and Banswara, Rajasthan. The functional capacity was evaluated and calculated using the Hospital Safety Index (HSI) from the World Health Organization Checklist duly modified. The sum of the elements for each sub-module led to a total sum, in turn, categorizing the functional capacity into one of three categories: functional (High), at risk (Average) or, inadequate (Low).

(b) **Study Area**. The study was carried-out in Government Health Facilities (District Hospital and Community Health Centre(CHC)) at Udaipur and Banswara districts respectively in Rajasthan.

(c) **Study Design**. Cross sectional Descriptive study design to assess the level of Disaster Preparedness in Government Health Facilities measured by Functional Capacity: A Comparison Between Udaipur and Banswara Districts (Rajasthan).

(d) **Study Period**. 01 Feb to 30 Apr 2019 in three phases. In first phase framework was understood and study approval was taken. In second phase tools were decided. In third phase data analysis was done. Data collection was done simultaneously during a period of three months.

(e) **Study Population**. The study was conducted amongst the Government Health Facilities (District Hospital and one Community Health Centre (CHC)) at Udaipur and Banswara districts respectively in Rajasthan.

(f) **Sample Size**. It is a purposive convenience sampling. A total of four government health facilities were assessed in both the districts based on the population of the area.

(g) **Study Tool**. For data collection, WHO Hospital Safety Index checklist duly modified has been used. It is targeted to assess structural and functional safety of hospitals. But for the purpose of this study, only the questions/elements related to functional safety in the checklist have been assessed. The checklist consists of two parts: first part includes general information of hospital and the second part contains five fields related to functional capacity and safety.

CHAPTER 5: OBSERVATIONS AND ANALYSIS

79. **Scoring Pattern (Safety Based on Functional Capacity of Hospital (HCF)**

(a) **Inadequate (Low)** : 0- 3 points.

(b) **At Risk (Average)** : 4 -7 points.

(c) **Functional (High)** : 8-10 points.

Organization Of The Hospital Disaster Committee And The Emergency Operations Center

80. **Committee Has Been Formally Established To Respond To Major Emergencies Or Disasters** Assessing the level of organization achieved by the Hospital Disaster Committee

(a) Committee has been formally established to respond to major emergencies or disasters

(b) Obtain a copy of the Committee's terms of reference and verify that the list of members corresponds to current personnel.

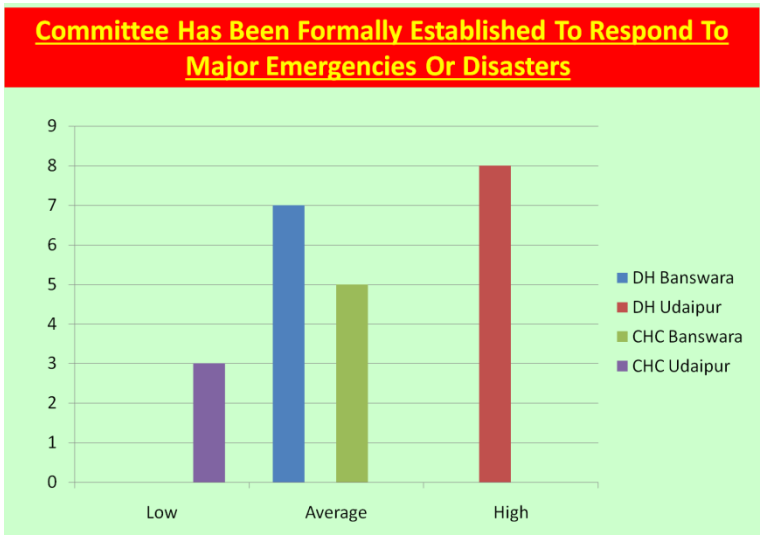
(i) Low = Committee does not exist

(ii) Average = Committee exists but is not functioning

(iii) High = Committee exists and is functioning

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	-	Yes	-	Average

A.1 Committee Has Been Formally Established To Respond To Major Emergencies Or Disasters



- DH Banswara and CHC Udaipur needs to have the existing committee functioning to ensure high level of preparedness
- Terms of reference of the committee exists in both the DH

81. **Committee Membership is Multi-Disciplinary**

(a) Verify that the positions on the Committee are occupied by personnel from diverse disciplines (for example, hospital director, chief of nursing, maintenance engineer, head of emergency services, medical director, chief of surgery, chief of laboratory and support services, among others)

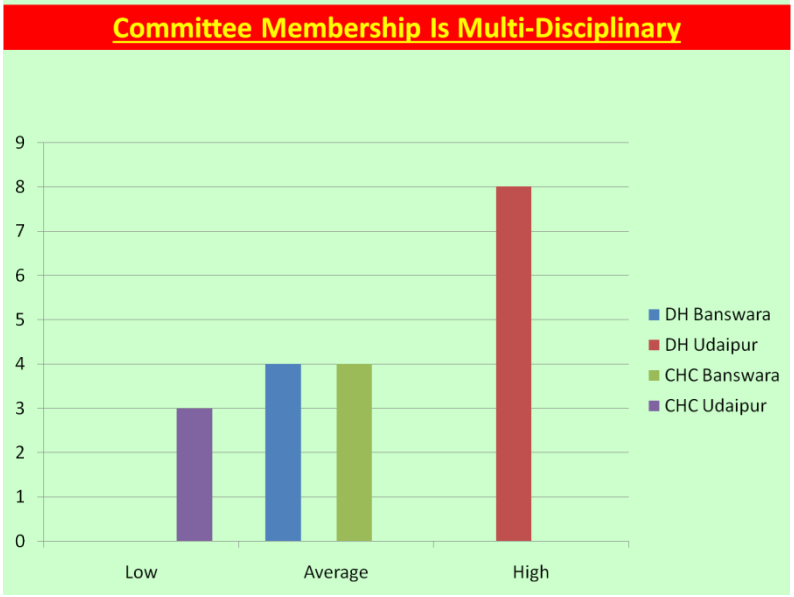
(i) Low = 0–3 disciplines represented

(ii) Average = 4–5 disciplines represented

(iii) High = 6 or more disciplines represented

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	-	Yes	-	Average

A.2 Committee Membership is Multi-Disciplinary



- DH Banswara needs to increase the number of disciplines represented in the disaster committee
- Essential to have a diverse representation and a multi disciplinary committee

82. **Each Member is Aware of His /Her Specific Responsibilities**

(a) Verify that members' assigned responsibilities are in writing, describing their specific roles

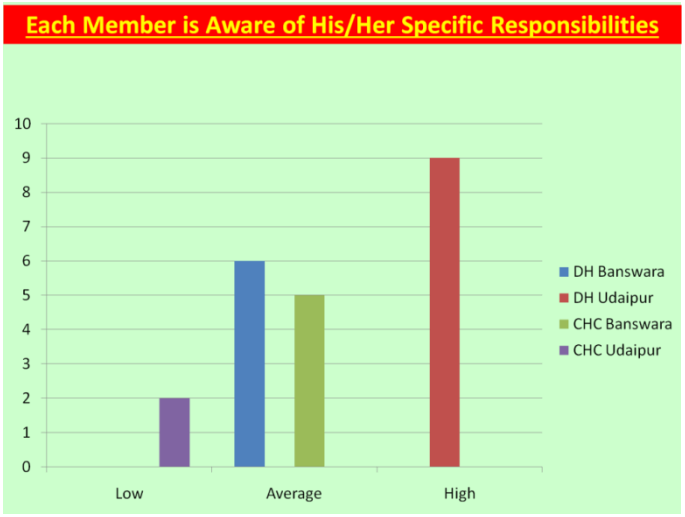
(i) Low = Responsibilities not assigned

(ii) Average = Responsibilities have been officially assigned

(iii) High = All members know and comply with their responsibilities.

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	Yes	-	-	Low
CHC Banswara	-	Yes	-	Average

A.3 Each Member is Aware of His/Her Specific Responsibilities



- Both DH Banswara and DH Udaipur should ensure that the respective members are aware of their responsibilities assigned
- The committee needs to be effective and efficient in their tasking

83. **Space Is Designated For The Hospital Space Is Designated For The Hospital Emergency Operations Centre (EOC)**

(a) Verify that a room has been designated for operational command and that all means of communication are present (telephone, fax, Internet, etc.).

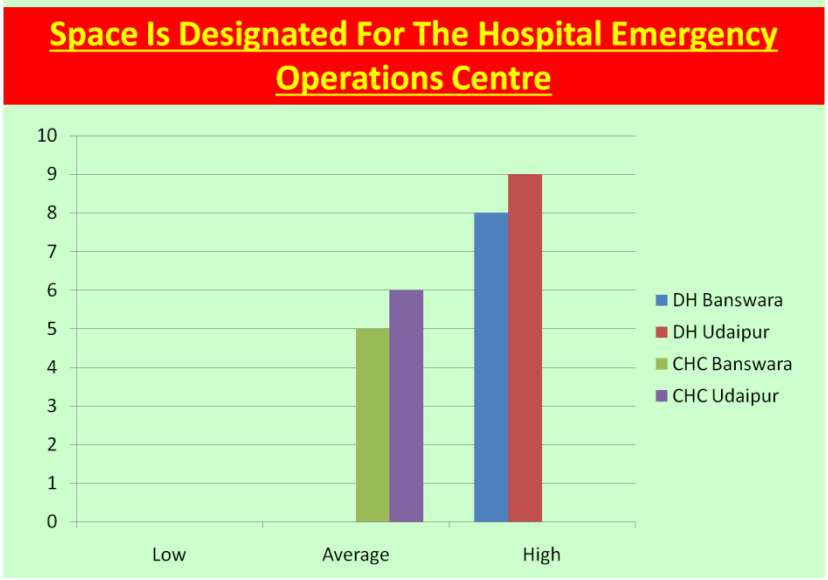
(i) Low = Nonexistent

(ii) Average = Space has been officially assigned

(iii) High = EOC exists and is functional

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.4. Space is designated for the hospital Emergency Operations Centre (EOC)



- Both CHC Banswara and DH Udaipur should ensure that the space is designated for the hospital EOC

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84. **The EOC is in a protected and safe location**

(a) Take into account accessibility, safety, and protection when checking the room used for the EOC.

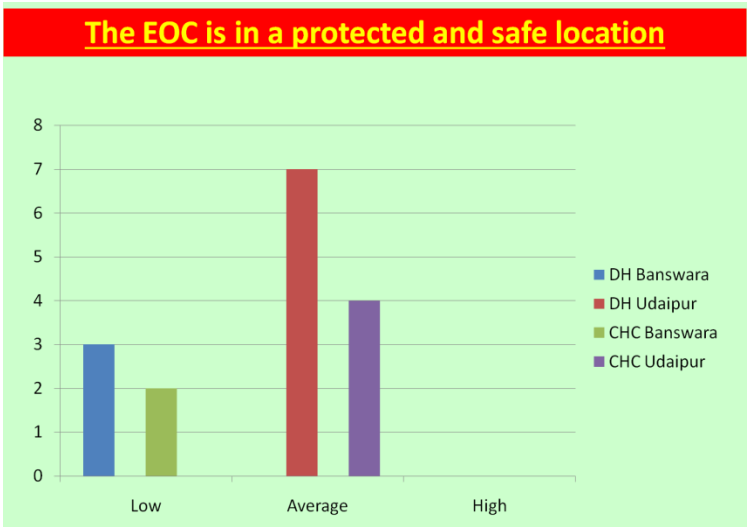
(i) Low = The room for the EOC is not in a safe location

(ii) Average = The EOC is in a safe location is but it is not easily accessible

(iii) High =The EOC is in a safe, protected, and easily accessible location

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	-	Yes	-	Average
DH Banswara	Low	-	-	Low
CHC Banswara	Low	-	-	Low

A.5 The EOC is in a protected and safe location



- Both DH Banswara and CHC as also DH Udaipur should ensure that EOC is in protected and safe location

85. **The EOC has a computer system and computers**

(a) Verify that the EOC has Internet and intranet connections.

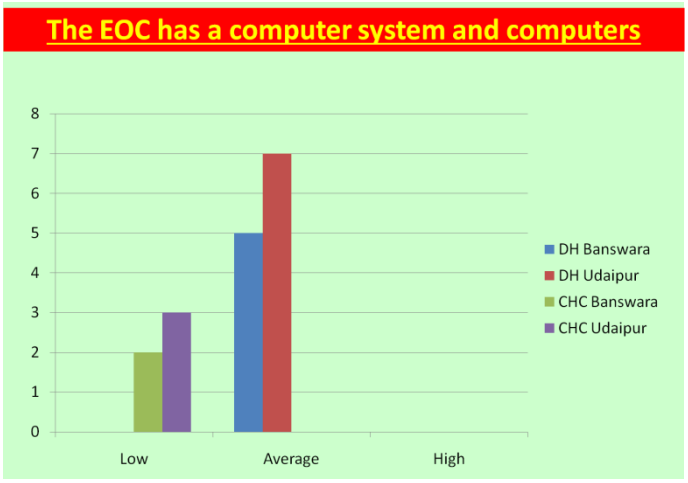
(i) Low = No

(ii) Average = Incomplete

(iii) High = The EOC has all computer system requirements

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.6 The EOC has a computer system and computers



- Both CHC Banswara and CHC Udaipur should ensure that EOC has computer system and adequate numbers of computers

.86. **Both internal and external communications systems in the EOC function properly**

(a) Determine whether the switchboard (telephone central for re-routing calls) has a paging or a public address system and the operators know the emergency codes and how to use them.

(i) Low = Does not function or is nonexistent

(ii) Average = Partly functional

(iii) High = Complete and functional

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.7 Both internal and external communications systems in the EOC function properly

- Both CHC Banswara and CHC Udaipur should ensure that both internal and external communications systems in the EOC function properly

87. **The EOC has an alternative communications system**

(a) Determine whether, besides the switchboard, there is an alternative communications system (e.g. cellular, two-way radio, etc.).

(i) Low = Nonexistent
(ii) Average = Incomplete
(iii) High = Yes

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara		-	Yes	High
CHC Banswara	-	Yes	-	Average

A.8 The EOC has an alternative communications system

- Both CHC Banswara and CHC Udaipur should ensure that the EOC has an alternative communications system for redundancy

. 88. **The EOC has adequate equipment and furnishings**

(a) Verify that there are desks, chairs, power outlets, lighting, water supply, and drainage.

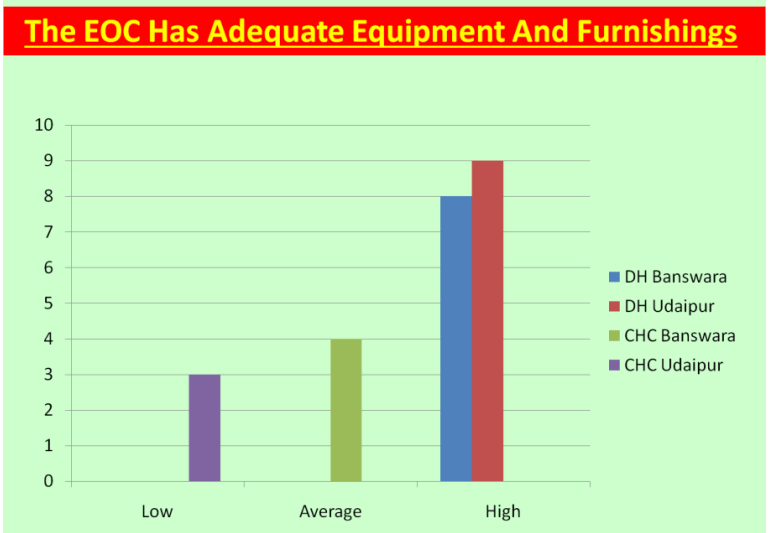
(i) Low = No

(ii) Average = Incomplete

(iii) High = Yes

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.9. The EOC has adequate equipment and furnishings



- CHC Udaipur should ensure that EOC has adequate equipment and furnishings

89. **An up-to-date telephone directory is available in the EOC**

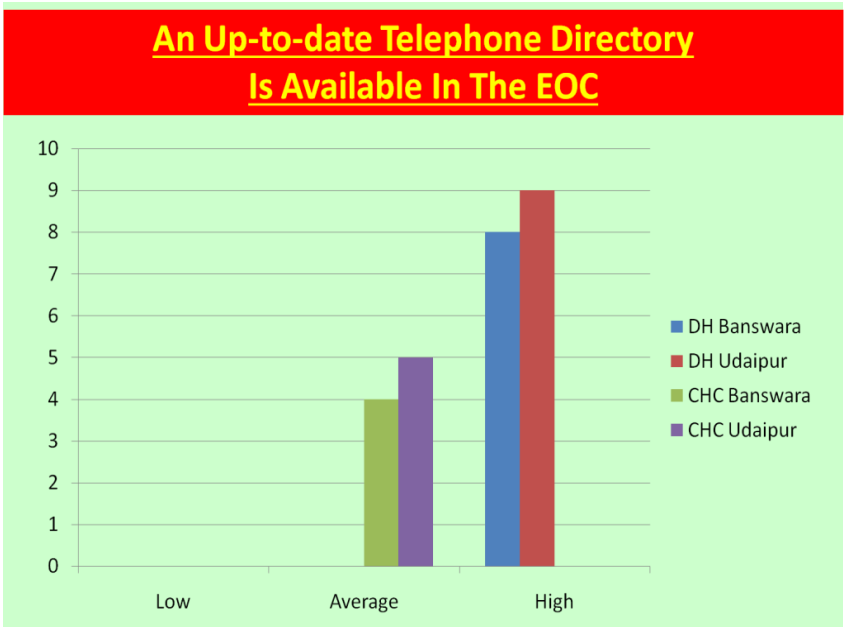
(a) Confirm that the directory includes all support services needed in an emergency

(i) Low = No

(ii) Average = Directory exists but is not up-to-date

(iii) High = Available and current

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur		Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average



- Both CHC Banswara and CHC Udaipur should ensure that the up-to-date telephone directory is available in the EOC

90. **"Action Cards" available for all personnel**

(a) Verify that action cards describe the assigned duties of each hospital staff member in case of an internal or external disaster.

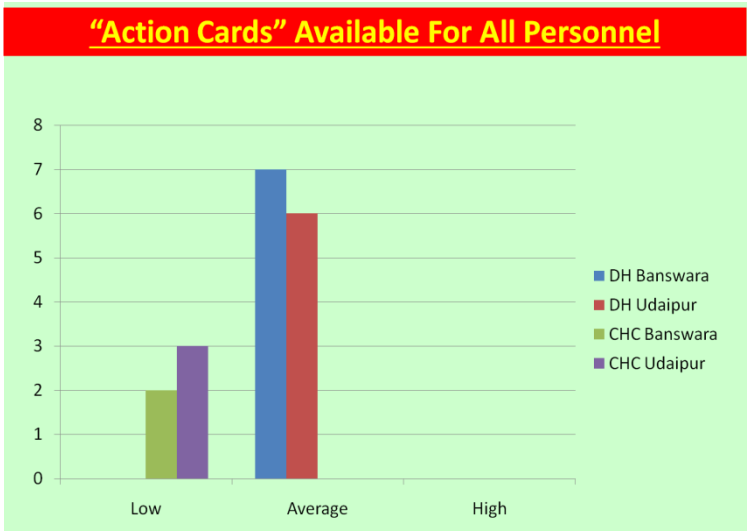
(i) Low = No

(ii) Average = Insufficient (numbers and quality)

(iii) High = All staff members have cards

	Level of Organisation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.11 "Action Cards" available for all personnel



- Both DH Banswara and DH Udaipur should ensure that "Action Cards" available for all personnel

Operational Plan For Internal Or External Disasters

91. **Strengthen essential hospital services**

(a) The plan specifies actions to be taken before, during, and after a disaster in the hospital's essential services

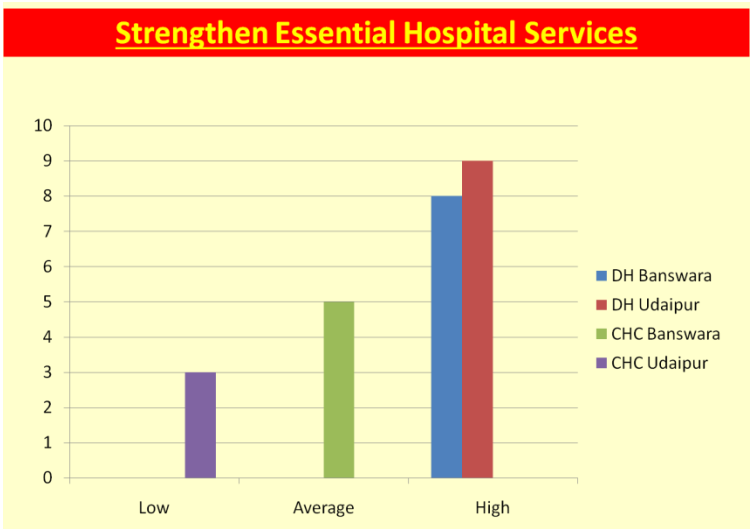
(i) Low = Plan does not exist or exists only as a document

(ii) Average = Plan exists and personnel have been trained

(iii) High = Plan exists, personnel have been trained, and resources are in place

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.12 Strengthen essential hospital services



- Both CHC Banswara and CHC Udaipur should ensure that they strengthen essential hospital services

92. **Procedures to activate and deactivate the plan**

(a) Verify that there are procedures for how, when, and by whom the plan is activated.

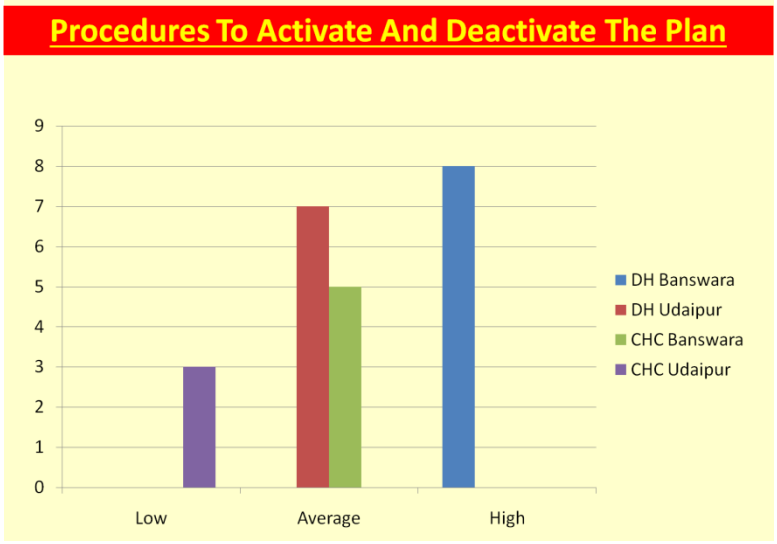
(i) Low = Plan does not exist or exists only as a document

(ii) Average = Plan exists and personnel have been trained

(iii) High = Plan exists, personnel have been trained, and resources are in place to carry out the procedures

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.13 Procedures to activate and deactivate the plan



- Both DH Udaipur and CHC Banswara should ensure that the Procedures exist to activate and deactivate the plan

93 **Special administrative procedures for disasters**

(a) Verify that the plan includes procedures for contracting personnel and for procurements in case of disaster.

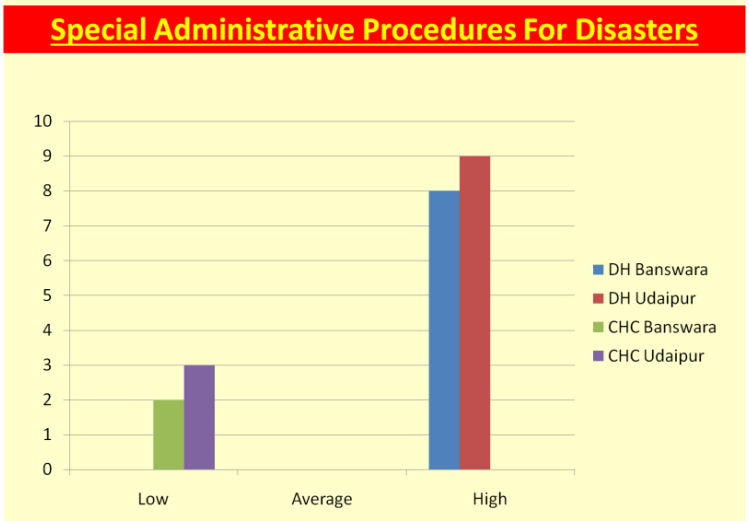
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Plan exists, personnel have been trained, and resources are in place to carry out the procedures

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	Yes	-	-	Low

A.14 Special administrative procedures for disasters



- Both CHC Banswara and CHC Udaipur should ensure that Special administrative procedures for disasters are put in place and functional

94. **Financial resources for emergencies are budgeted and guaranteed**

(a) Verify that the hospital has a specific budget for use in disaster situations.

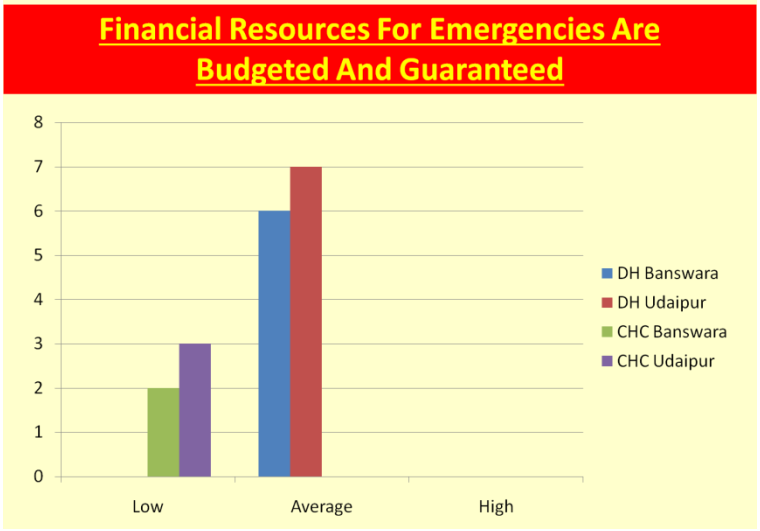
(i) Low = Not budgeted

(ii) Average = Funds will cover less than 72 hours

(iii) High = Funds are guaranteed for 72 hours or more

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara		Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.15 Financial resources for emergencies are budgeted and guaranteed



- Both DH Banswara and DH Udaipur including both CHC should ensure that Financial resources for emergencies are budgeted and guaranteed to the health care facilities

95. **Procedures for expanding usable space, including the availability of extra beds**

(a) The plan identifies physical spaces that can be equipped to treat mass casualties.

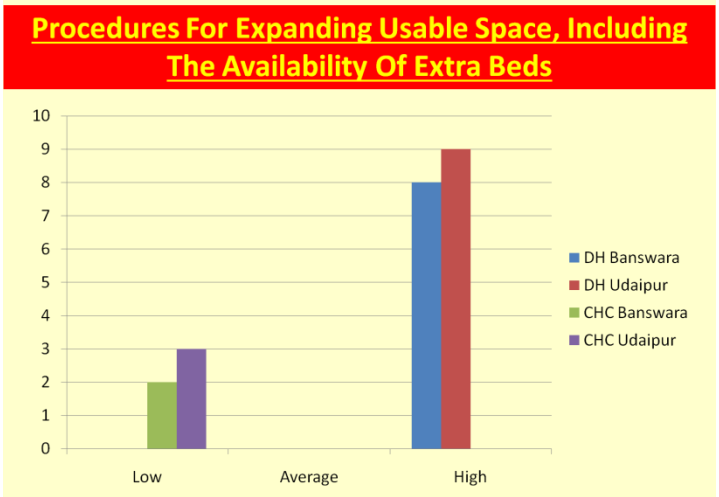
(i) Low = Space for expansion has not been identified;

(ii) Average = Space has been identified and personnel have been trained to carry out the expansion;

(iii) High = Procedures exist, personnel have been trained, and resources are in place to carry out expansion of space.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.16 Procedures for expanding usable space, including the availability of extra beds



- Both CHC Banswara and CHC Udaipur should ensure that the Procedures for expanding usable space, including the availability of extra beds are put in place

96. **Procedures for admission to the emergency department**

(a) The plan specifies the places and personnel responsible for carrying out triage.

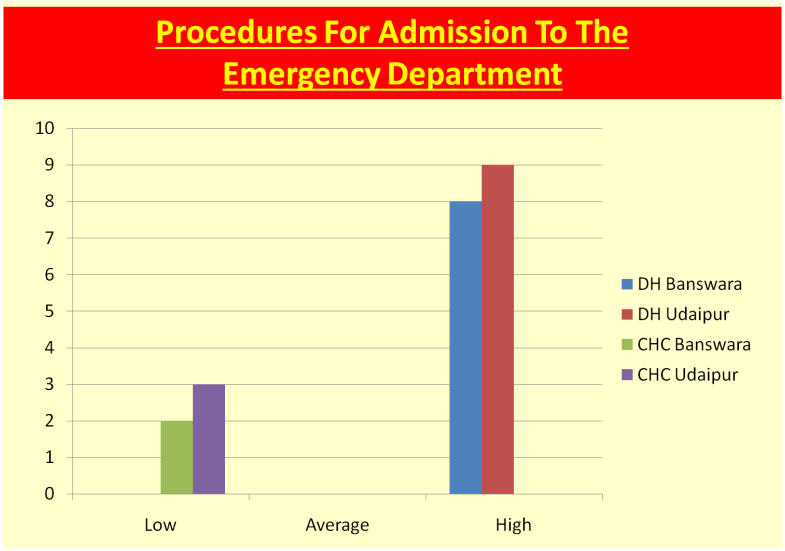
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes(NA)	-	-	Low(NA)
DH Banswara	-	-	Yes	High
CHC Banswara	Yes(NA)	-	-	Low(NA)

A.17 Procedures for admission to the emergency department



- Both CHC Banswara and CHC Udaipur should ensure that the Procedures for admission to the emergency department be streamlined

97. **Procedures to expand emergency department and other critical services**

(a) The plan should indicate actions needed to expand hospital services (for example, drinking water supply, power, wastewater).

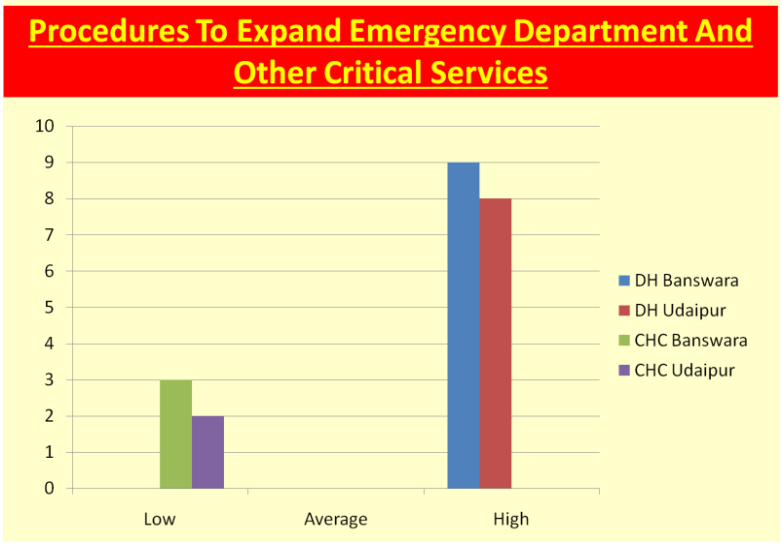
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes(NA)	-	-	Low(NA)
DH Banswara	-	-	Yes	High
CHC Banswara	Yes(NA)	-	-	Low(NA)

A.18 Procedures to expand emergency department and other critical services



- Both CHC Banswara and CHC Udaipur should ensure that the Procedures to expand emergency department and other critical services are put in place

98. **Procedures to protect patients' medical records**

(a) The plan indicates how medical and other critical patient records can be safely moved.

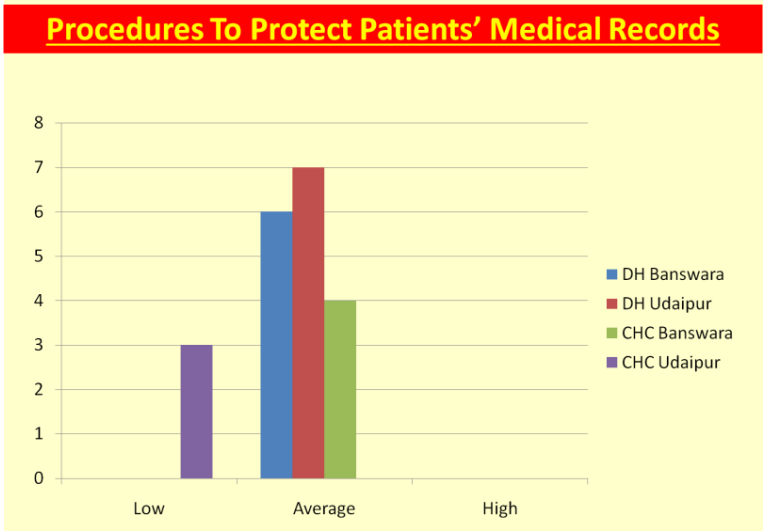
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	-	Yes	-	Average

A.19 Procedures to protect patients' medical records



- Both DH Banswara and DH Udaipur including CHC should ensure Procedures to protect patients' medical records are ensured

99. **Regular safety inspections are conducted by the appropriate authority**

(a) Note the expiration and/or refill dates of fire extinguishers and of flow tests for fire hydrants. Examine logbooks that record equipment tests and dates of inspections by civil defence personnel.

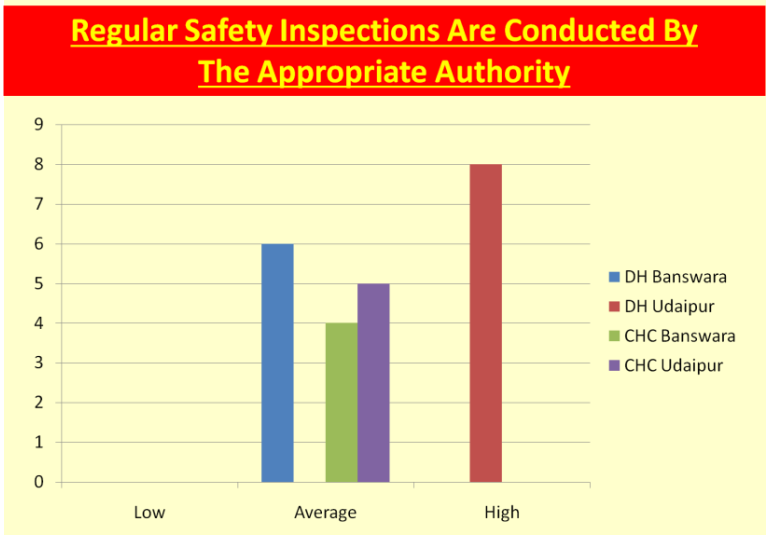
(i) Low = Inspections do not occur

(ii) Average = Incomplete or outdated inspection

(iii) High = Inspections are complete and up-to-date

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-		Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	Yes	-	Average
CHC Banswara	-	Yes	-	Average

A.20 Regular safety inspections are conducted by the appropriate authority



- Both DH Banswara and CHC Udaipur and Banswara should ensure that Regular safety inspections are conducted by the appropriate authority

100. **Procedures for hospital epidemiological surveillance**

(a) Verify that the hospital's Epidemiologic Surveillance Committee has specific procedures for disaster incidents or treatment of mass casualties.

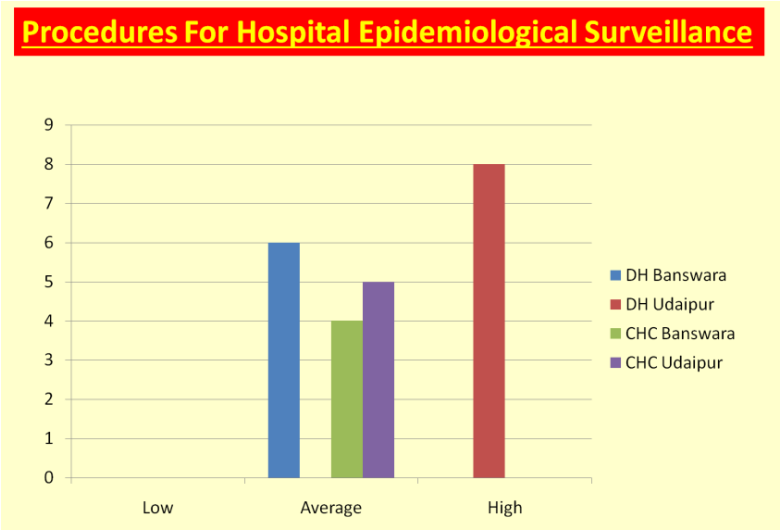
(i) Low = Procedures do not exist or exist only in a document;

(ii) Average = Procedures exist and personnel have been trained;

(iii)High = Procedures exist, personnel have been trained, and resources are in place

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-		Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	Yes	-	Average
CHC Banswara	-	Yes	-	Average

A.21 Procedures for hospital epidemiological surveillance



- Both DH Banswara and CHC Udaipur and Banswara should ensure that procedures for epidemiological surveillance is ensured

. 101. **Procedures for preparing sites for temporary placement of dead bodies and for forensic medicine**

(a) Verify that the plan includes specific arrangements for pathology and a site for the placement of multiple cadavers.

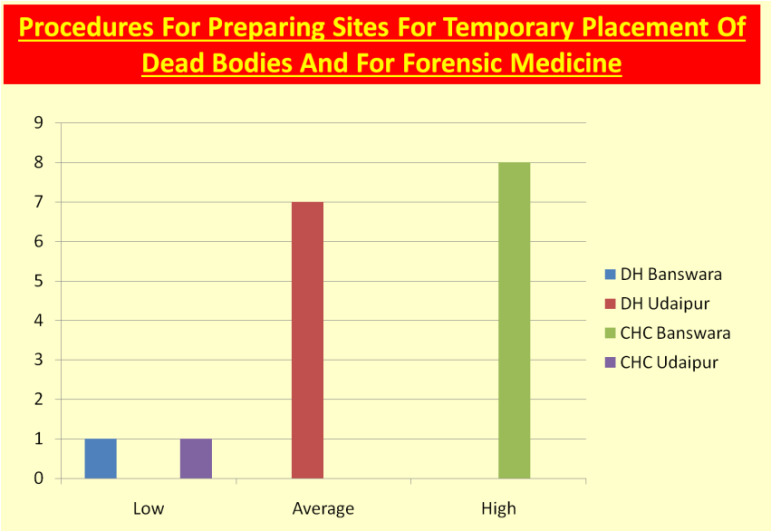
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes (NA)	-	-	Low (NA)
DH Banswara	-	-	Yes	Low
CHC Banswara	Yes (NA)	-	-	Low (NA)

A.22 Procedures for preparing sites for temporary placement of dead bodies and for forensic medicine



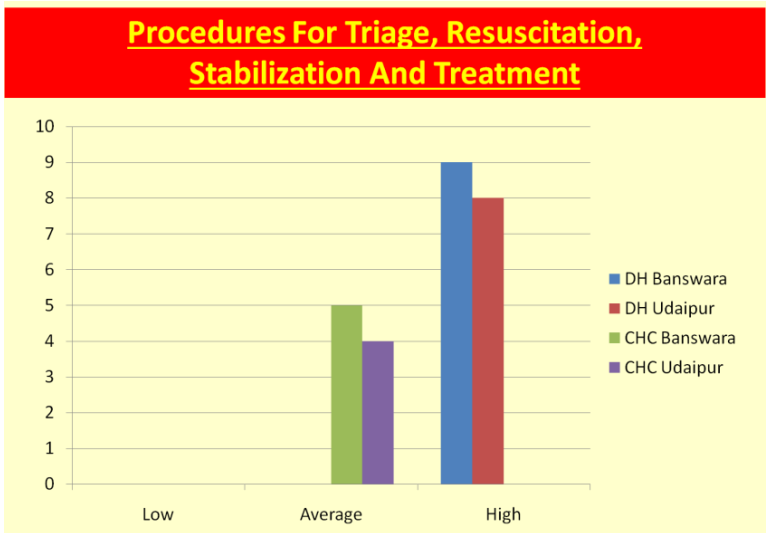
- DH Udaipur should ensure that the Procedures for preparing sites for temporary placement of dead bodies and for forensic medicine is put in place

102. **Procedures for triage, resuscitation, stabilization, and treatment**

(a) Verify
(i) Low = Procedures do not exist or exist only in a document
(ii) Average = Procedures exist and personnel have been trained
(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.23 Procedures for triage, resuscitation, stabilization, and treatment



- Both CHC Banswara and CHC Udaipur should ensure that the Procedures for triage, resuscitation, stabilization, and treatment is made more responsive

103. **Transport and logistics support**

(a) Confirm that the hospital has ambulances and other official vehicles.

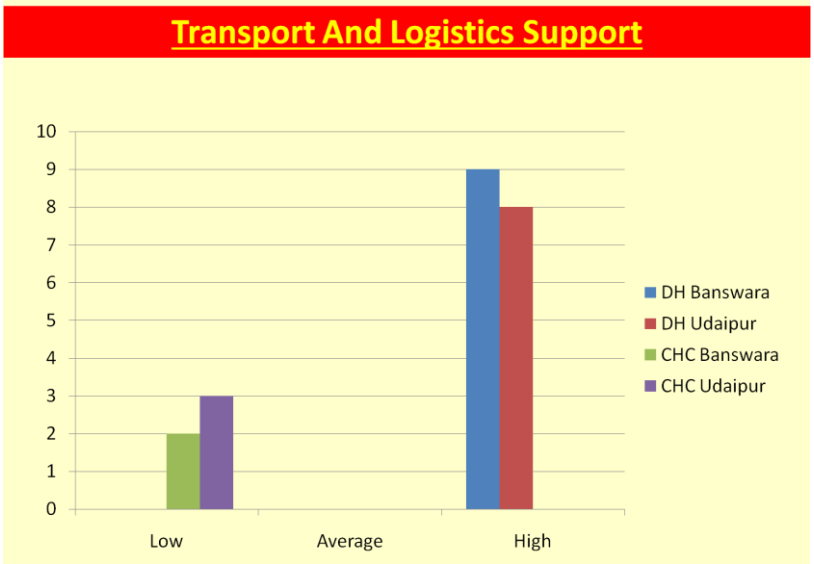
(i) Low = Ambulances and vehicles for logistic support are not available

(ii) Average = There are insufficient vehicles

(iii) High = Appropriate vehicles in sufficient numbers are available

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	Yes	-	-	Low

A.24 Transport and logistics support



- Both CHC Banswara and CHC Udaipur should ensure that the Transport and logistics support is catered for properly

104. **Food rations for hospital staff during the emergency**

(a) The plan specifies actions for supplying food during the emergency and funds for these supplies are included in the budget.

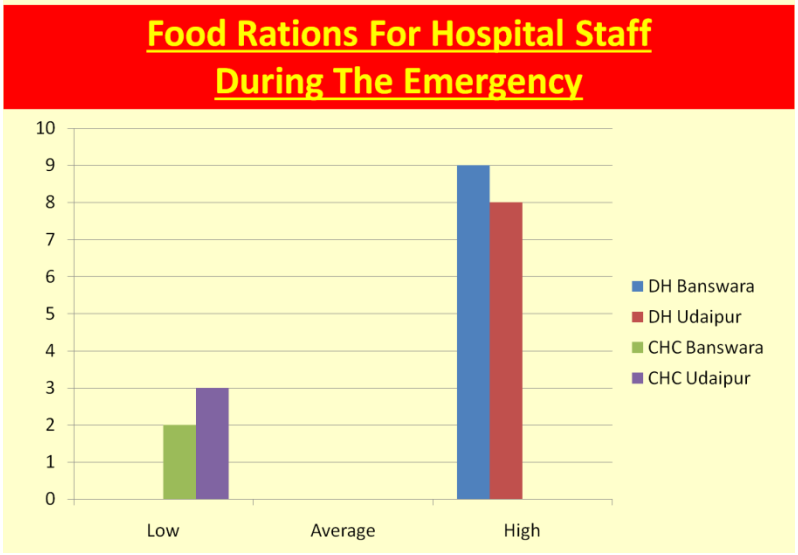
(i) Low = Nonexistent;

(ii)Average = Covers less than 72 hours;

(iii) High = Guaranteed for at least 72 hours.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	Yes	-	-	Low

A.25 Food rations for hospital staff during the emergency



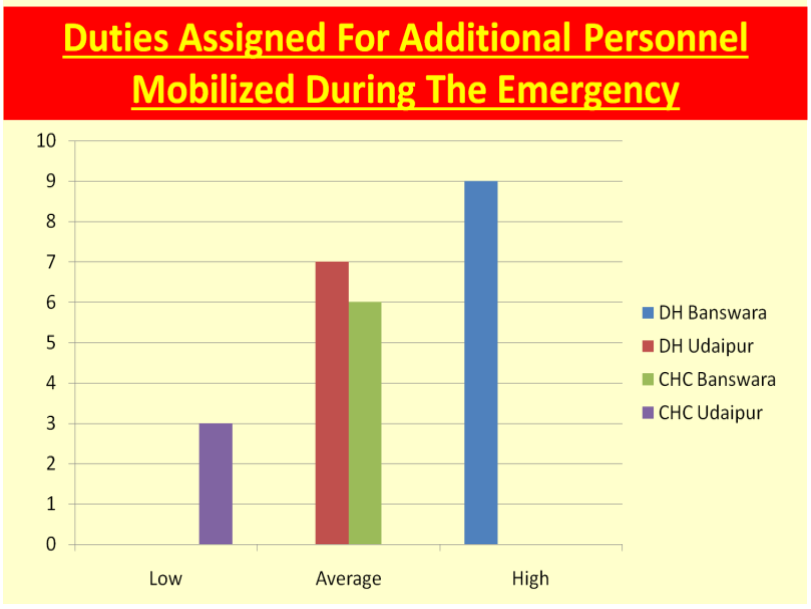
- Both CHC Banswara and CHC Udaipur should ensure that Food rations for hospital staff during the emergency is adequately catered for

105. **Duties assigned for additional personnel mobilized during the emergency**

(a) Low = Assignments do not exist or exist only in a document
(b) Average = Duties are assigned and personnel have been trained
(c) High = Duties are assigned, personnel have been trained, and resources are in place to mobilize the personnel

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.26 Duties assigned for additional personnel mobilized during the emergency



- Both DH Udaipur and both CHC should ensure that Duties assigned for additional personnel mobilized during the emergency be ensured

106. **Measures to ensure the well-being of additional personnel mobilized during the emergency**

(a) The plan identifies where emergency personnel can rest, drink, and eat.

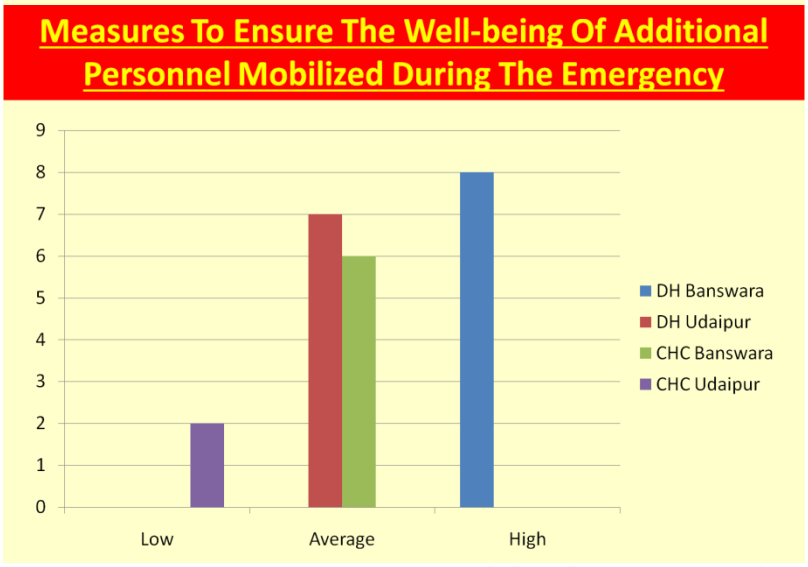
(i) Low = Nonexistent;

(ii) Average = Measures cover less than 72 hours;

(iii) High = Measures are ensured for at least 72 hours.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.27 Measures to ensure well-being of additional personnelmobilized during the emergency



- Both DH Udaipur and CHC should ensure that Measures to ensure well-being of additional personnel mobilized during the emergency be put in place in letter and spirit

107. **Cooperative arrangements with local emergency plan**

(a) Verify that members' assigned responsibilities are in writing, describing their specific roles

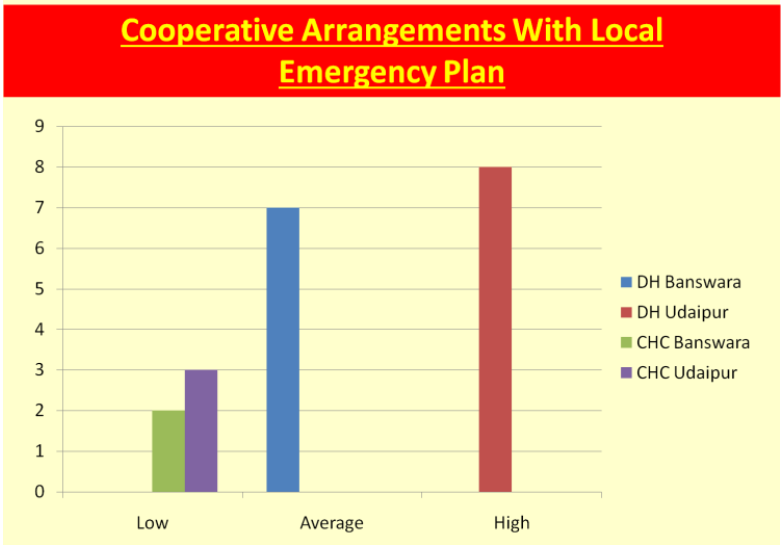
(i) Low = Responsibilities not assigned

(ii) Average = Responsibilities have been officially assigned

(iii) High = All members know and comply with their responsibilities.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.28 Cooperative arrangements with local emergency plan



- Both CHC Banswara and CHC Udaipur should ensure that the Cooperative arrangements with local emergency plan responsibilities be assigned

108. **Mechanism to prepare a census of admitted patients and those referred to other hospitals**

(a) The plan has specific forms that facilitate the listing of patients during emergencies.

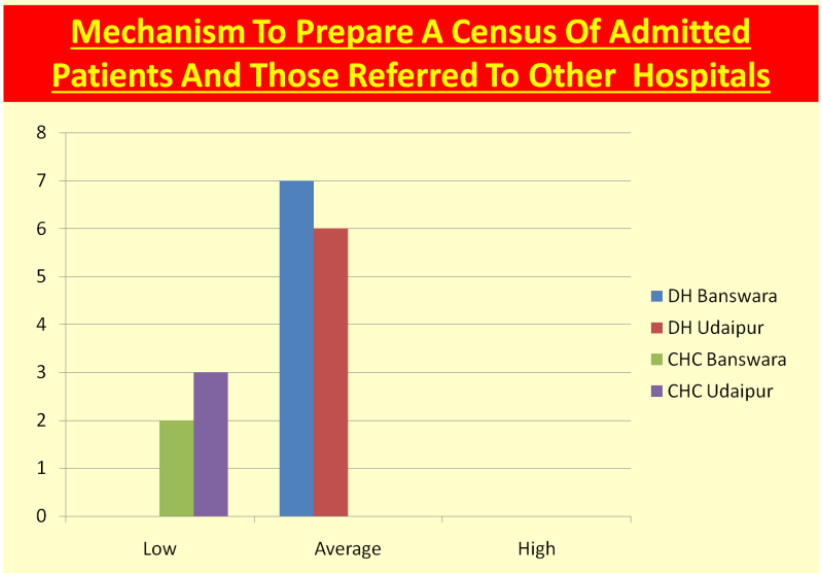
(i) Low = Mechanism does not exist or exists only as a document

(ii) Average = Mechanism exists and personnel have been trained

(iii) High = Mechanism exists, personnel have been trained, and resources are in place to carry out the census

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.29 Mechanism to prepare census of patients and those referred to other hospitals



- Both DH Udaipur and DH Banswara should ensure that the Mechanism to prepare census of patients and those referred to other hospitals

109. **System for referral and counter-referral of patients**

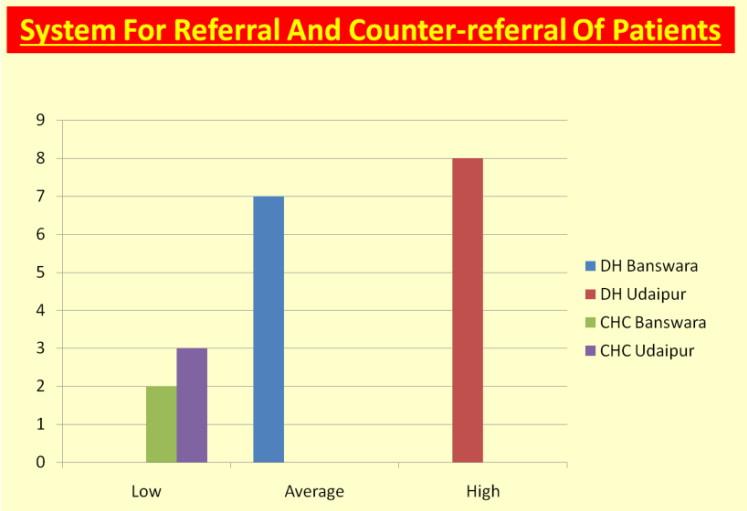
(a) Low = System does not exist or exists only as a document;

(b) Average = System exists and personnel have been trained;

(c) High = System exists, personnel have been trained, and resources are in place to carry out the plan

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.30 System for referral and counter-referral of patients



- Both CHC Banswara and CHC Udaipur should ensure that the System for referral and counter-referral of patients

110. **Procedures for communicating with the public and media**

(a) The hospital disaster plan specifies who is responsible for communicating with the public and media in case of

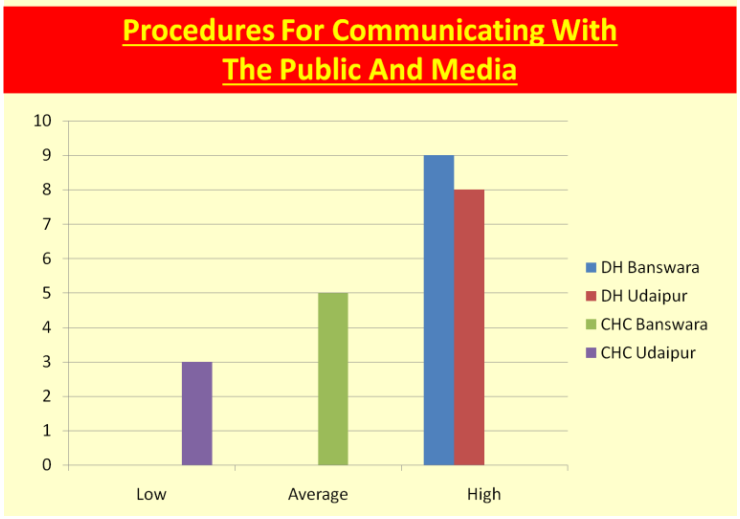
(i) Low = Procedures do not exist or exist only in a document;

(ii) Average = Procedures exist and personnel have been trained;

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	Low
CHC Banswara	-	Yes	-	Average

A.31 Procedures for communicating with the public and media



- Both CHC Banswara and CHC Udaipur should ensure Procedures for communicating with the public and media

111. **Procedures for response during evening, weekend, and holiday shifts**

(a) Verify

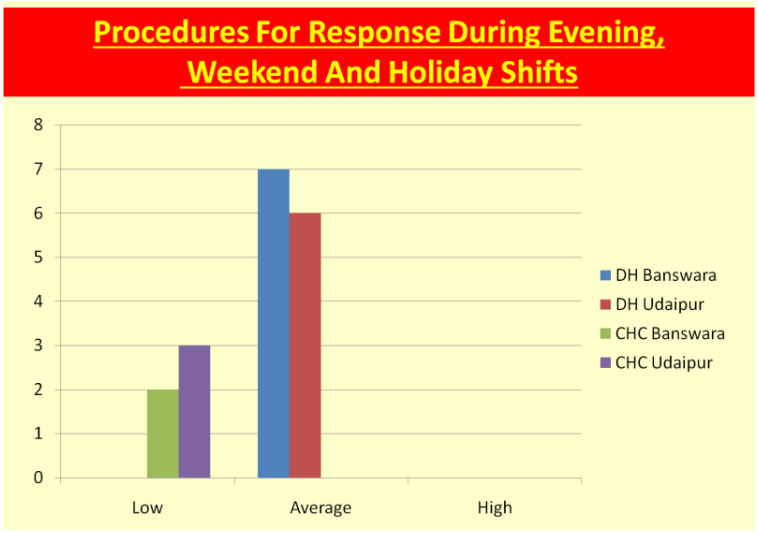
(i) Low = Procedures do not exist or exist only in a document;

(ii) Average = Procedures exist and personnel have been trained;

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.32 Procedures for response during evening, weekend, and holiday shifts



- Both DH Banswara and DH Udaipur and CHC should ensure that Procedures for response during evening, weekend, and holiday shifts

112. **Procedures for the evacuation of the facility**

(a) Verify procedures to evacuate patients, visitors, and staff.

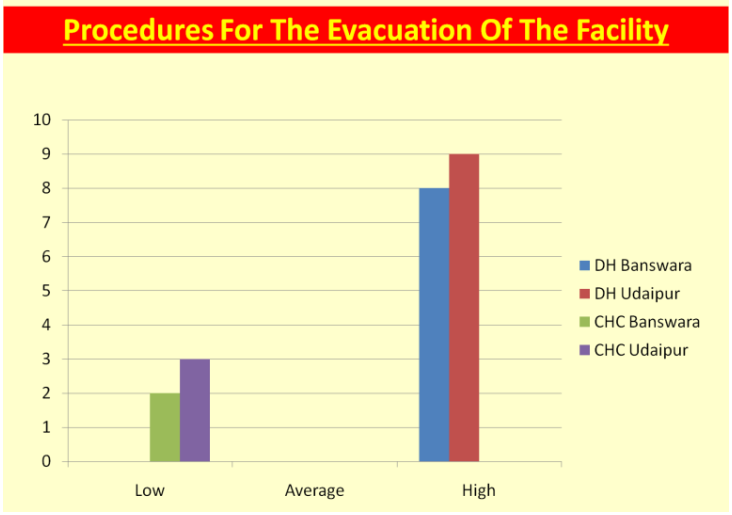
(i) Low = Procedures do not exist or exist only in a document;

(ii) Average = Procedures exist and personnel have been trained;

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	Yes	-	-	Low

A.33 Procedures for the evacuation of the facility



- Both CHC Banswara and CHC Udaipur should ensure that the Procedures for the evacuation of the facility

113. **Emergency and other exit routes are accessible**

(a) Verify that exit routes are clearly marked and free of obstacles.

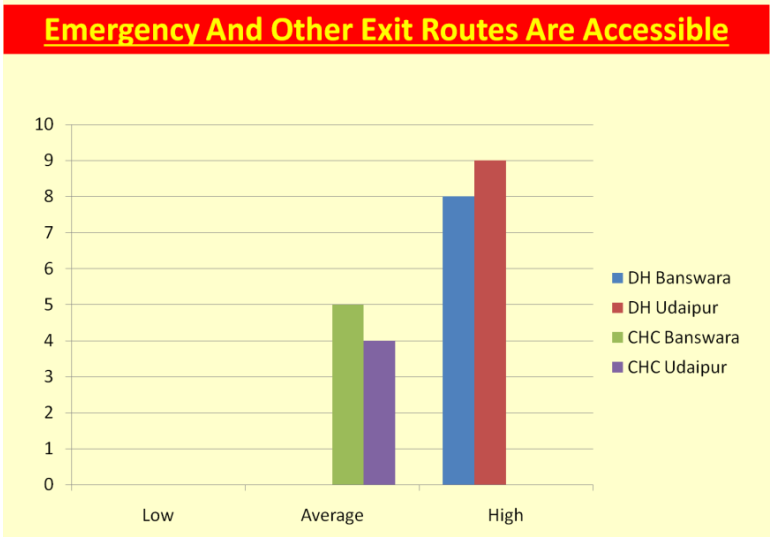
(i) Low = Exit routes are not clearly marked and many are blocked;

(ii) Average = Some exit routes are marked and most are clear of obstacles;

(iii) High = All exit routes are clearly marked and free of obstacles.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.34 Emergency and other exit routes are accessible



- Both CHC Banswara and CHC Udaipur should ensure that Emergency and other exit routes are accessible

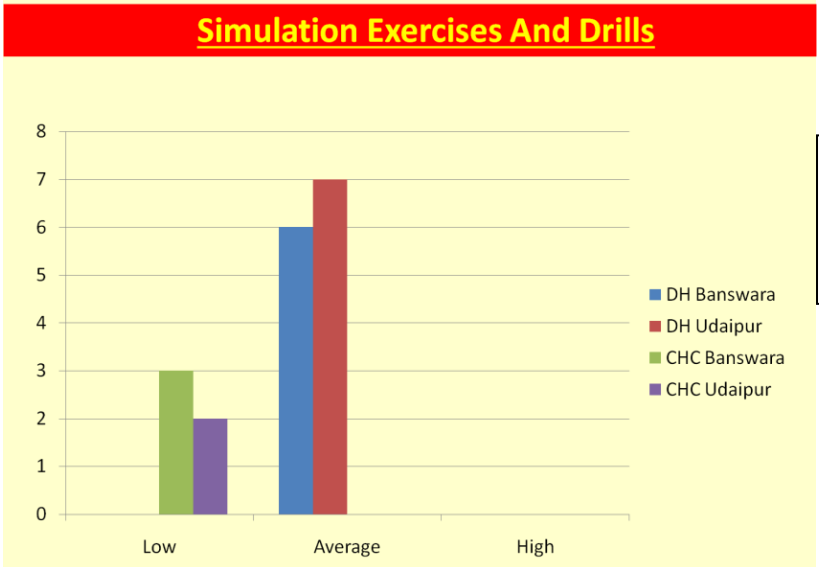
114. **Simulation exercises and drills**

(a) Verify that members' assigned responsibilities are in writing, describing their specific roles

(i) Low = Responsibilities not assigned
(ii) Average = Responsibilities have been officially assigned
(iii) High = All members know and comply with their responsibilities.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	Yes	-	-	Low
CHC Banswara	-	Yes	-	Average

A.35 Simulation exercises and drills



- Both DH Banswara and DH Udaipur and CHC should ensure that Simulation exercises and drills are practiced regularly

Contingency Plans For Medical Treatment In Disasters

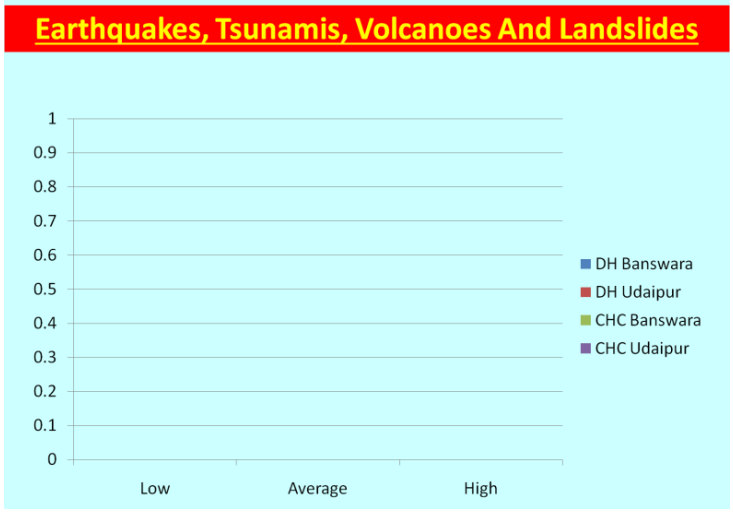
115. **Earthquakes, tsunamis, volcanoes, and landslides**

(a) If These Hazards Do Not Exist Where The Hospital Is Located, Leave The Boxes Blank.

(i) Low = Plan does not exist or exists only as a document;
(ii) Average = Plan exists and personnel have been trained;
(iii) High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	-	NA
CHC Udaipur	-	-	-	NA
DH Banswara	-	-	-	NA
CHC Banswara	-	-	-	NA

A.36 Earthquakes, tsunamis, volcanoes, and landslides



- Not Applicable

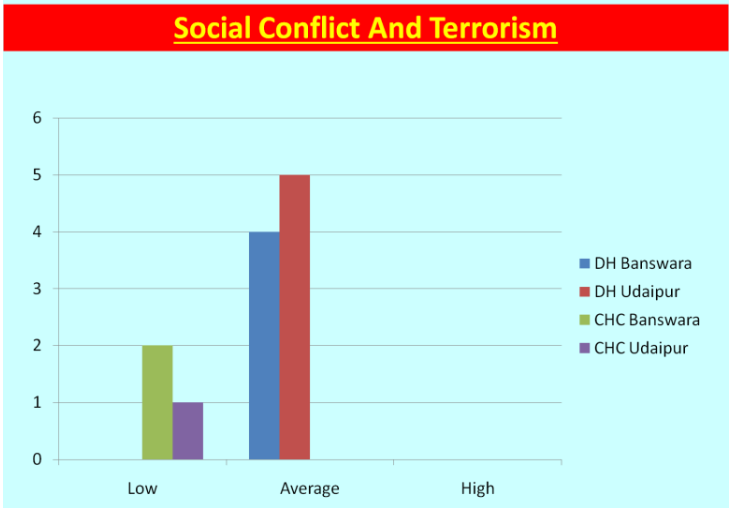
116. **Social conflict and terrorism**

(a) Verify

(i) Low = Plan does not exist or exists only as a document;
(ii) Average = Plan exists and personnel have been trained;
(iii) High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	Yes	-	-	Low
CHC Banswara	-	Yes	-	Average

A.37 Social conflict and terrorism



- Both DH Banswara and DH Udaipur and CHC should ensure that challenges of Social conflict and terrorism are addressed positively

117. **Floods and hurricanes**

(a) If These Hazards Do Not Exist Where The Hospital Is Located, Leave The Boxes Blank.

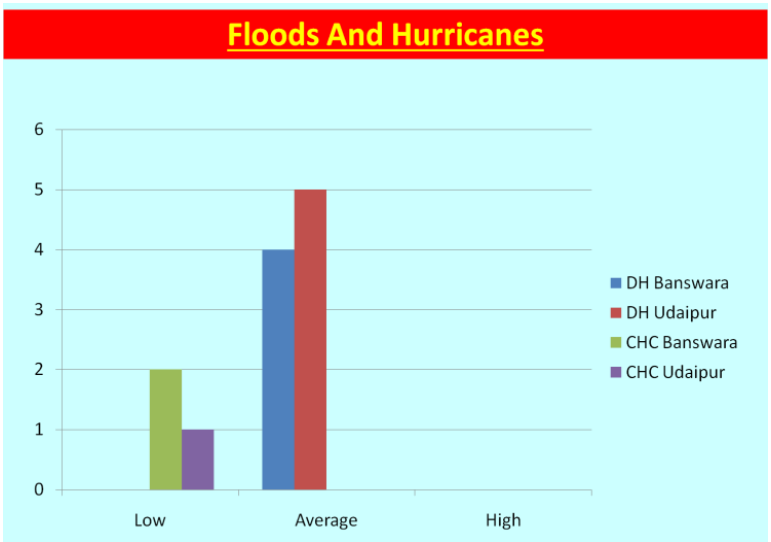
(i) Low = Plan does not exist or exists only as a document;

(ii) Average = Plan exists and personnel have been trained;

(iii) High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	Yes	-	-	Low
CHC Banswara	-	Yes	-	Average

A.38 Floods and hurricanes



Both DH Banswara and DH Udaipur including CHC should ensure Plan exists, personnel have been trained, and resources are in place to carry out the plan for Floods and hurricanes

. 118. **Fires and explosions.**

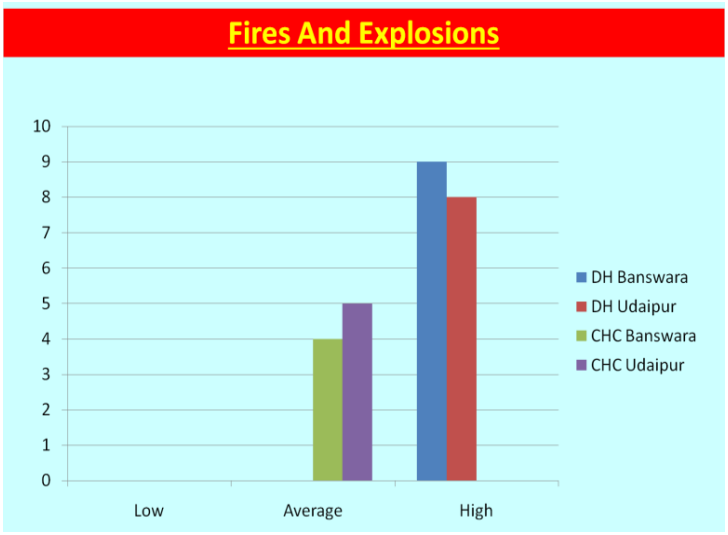
(a) Low = Plan does not exist or exists only as a document;

(b) Average = Plan exists and personnel have been trained;

(c) High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.39 Fires and explosions.



Both CHC Banswara and CHC Udaipur should ensure Plan exists, personnel have been trained, and resources are in place to carry out the fires and explosion plan.

119. **Chemical accidents OR exposure to ionizing radiation**

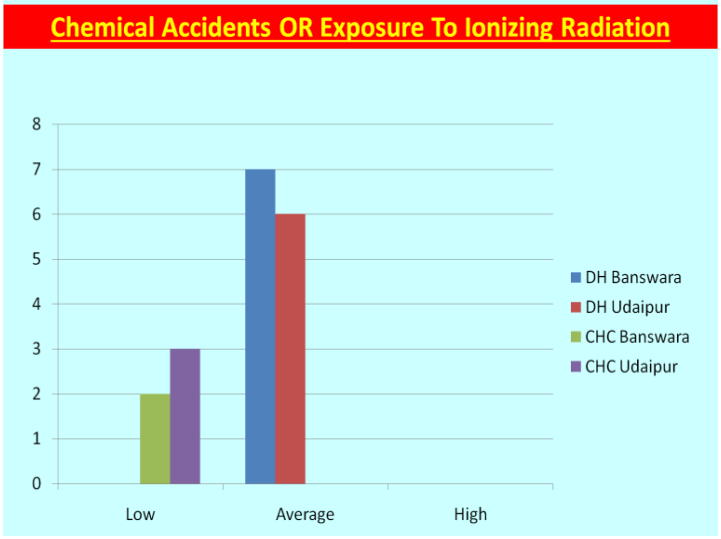
(a) Low = Plan does not exist or exists only as a document;

(b)Average = Plan exists and personnel have been trained;

(c)High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.40 Chemical accidents OR exposure to ionizing radiation



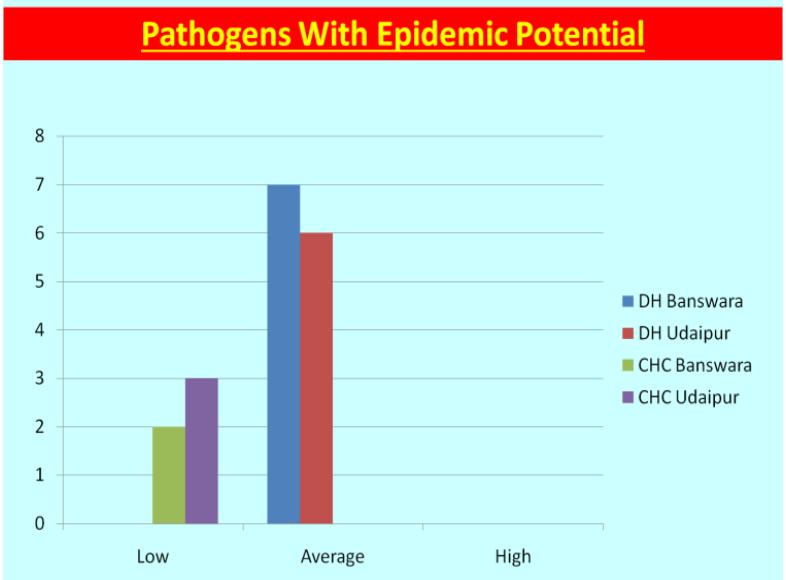
Both DH Banswara and DH Udaipur and CHC should ensure that the Plan exists, personnel have been trained, and resources are in place to carry out the plan in case of chemical accidents

120. **Pathogens with epidemic potential**

(a) Low = Plan does not exist or exists only as a document;
(b) Average = Plan exists and personnel have been trained;
(c) High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.41 Pathogens with epidemic potential



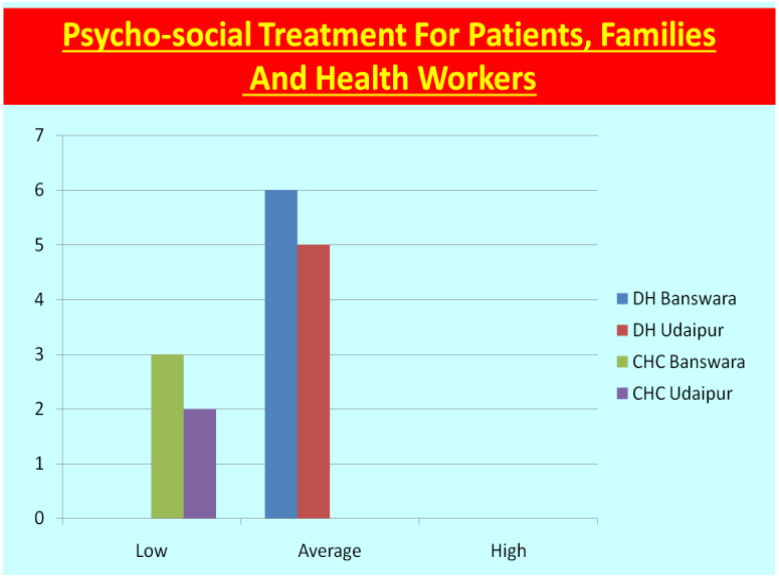
Both DH Banswara and DH Udaipur and CHC should ensure that the Plan exists, personnel have been trained, and resources are in place to carry out the plan with regards to pathogens with epidemic potential

121. **Psycho-social treatment for patients, families, and health workers**

(a) Low = Plan does not exist or exists only as a document;
(b) Average = Plan exists and personnel have been trained;
(c) High = Plan exists, personnel been trained, and resources are in place to carry out the plan.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	Yes	-	-	Low
CHC Banswara	-	Yes	-	Average

A.42 Psycho-social treatment for patients, families, and health workers



- Both DH Banswara and DH Udaipur including CHC should ensure that Psycho-social treatment for patients, families, and health workers

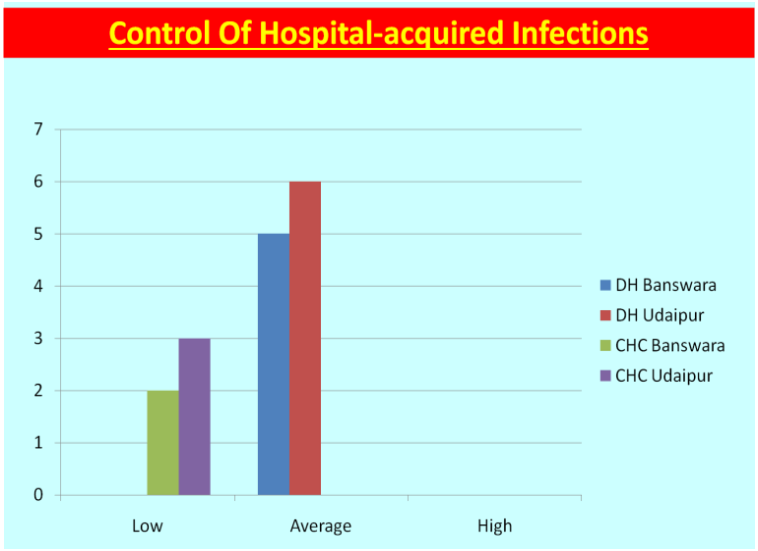
122. **Control of hospital-acquired infections**

(a) Request the corresponding hospital manual and verify whether control procedures are in force.

(i) Low = Manual does not exist or exists only as a document;
(ii) Average = Manual exists and personnel have been trained;
(iii) High = Manual exists, personnel have been trained, and resources are available to implement measures.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.43 Control of hospital-acquired infections



- Both DH Banswara and DH Udaipur including CHC should ensure that proper Control of hospital-acquired infections

Plans For The Operation, Preventive Maintenance, And Restoration Of Critical Services Measure The Level Of Availability, Accessibility, And Relevance Of Documents That Are Essential When Responding To An Emergency

123. **Electric power supply and back-up generators**

(a) The maintenance division should provide the operations manual for the back-up electric generator as well as preventive maintenance records.

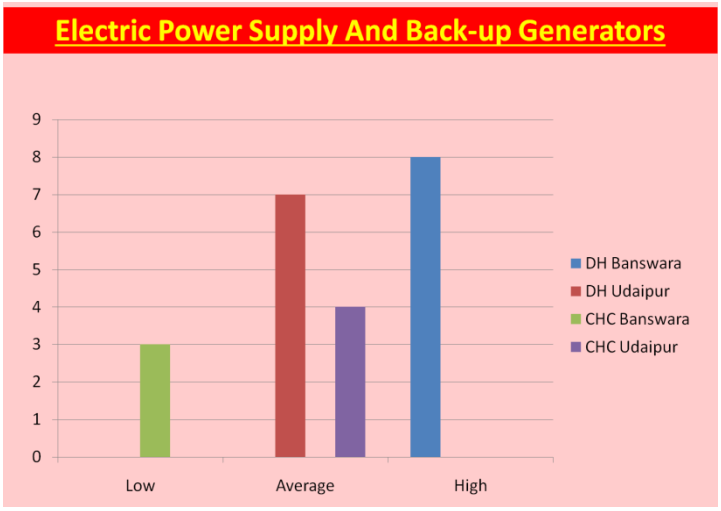
(i) Low = Procedures do not exist or exist only in a document;

(ii) Average = Procedures exist and personnel have been trained;

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.44 Electric power supply and back-up generators



- Both DH Banswara and DH Udaipur including CHC should ensure proper Electric power supply and back-up generators

124. **Drinking water supply**

(a) The maintenance division should provide the operations manual for the water supply system as well as records on preventive maintenance and water quality control.

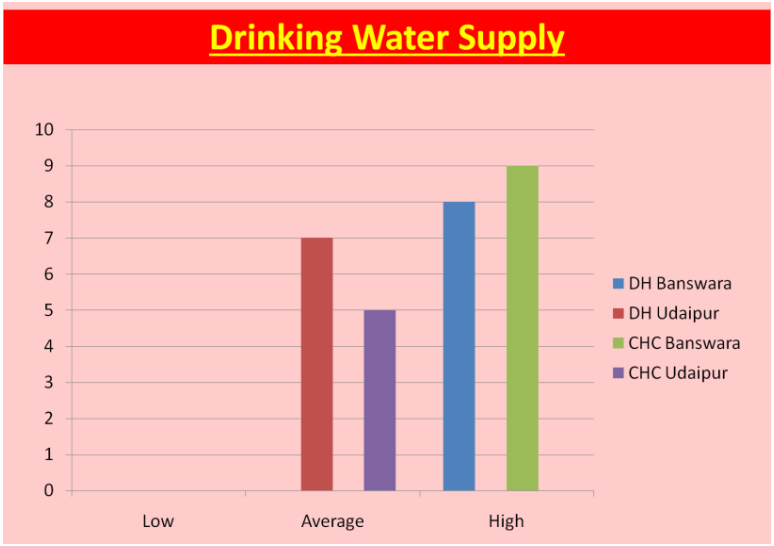
(i) Low = Procedures do not exist or exist only in a document;

(ii) Average = Procedures exist and personnel have been trained;

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them.

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.45 Drinking water supply



- Both CHC Banswara and CHC Udaipur should ensure proper and regular drinking water supply

125. **Fuel reserves**

(a) The maintenance division should provide the operations manual for fuel supplies, as well as preventive maintenance records.

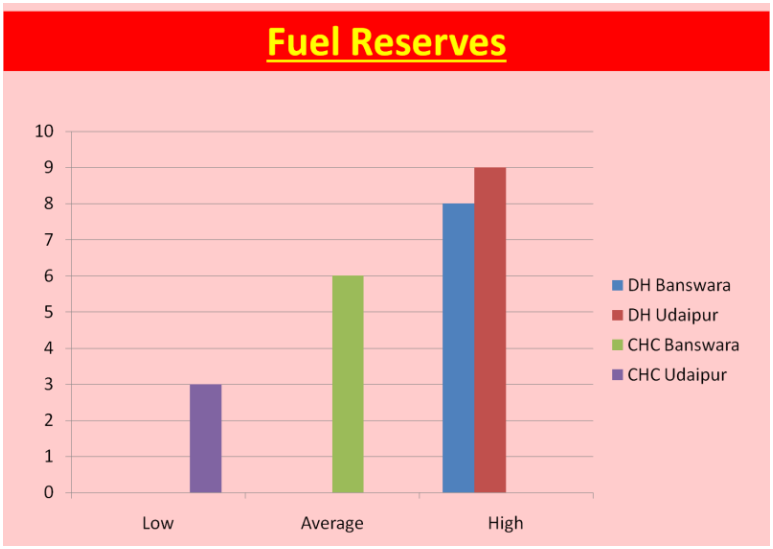
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.46 Fuel reserves



- Both CHC Banswara and CHC Udaipur should ensure regular and adequate Fuel reserves

.126. **Medical gases**

(a) The maintenance division should provide the operations manual for medical gases supply, as well as preventive maintenance records.

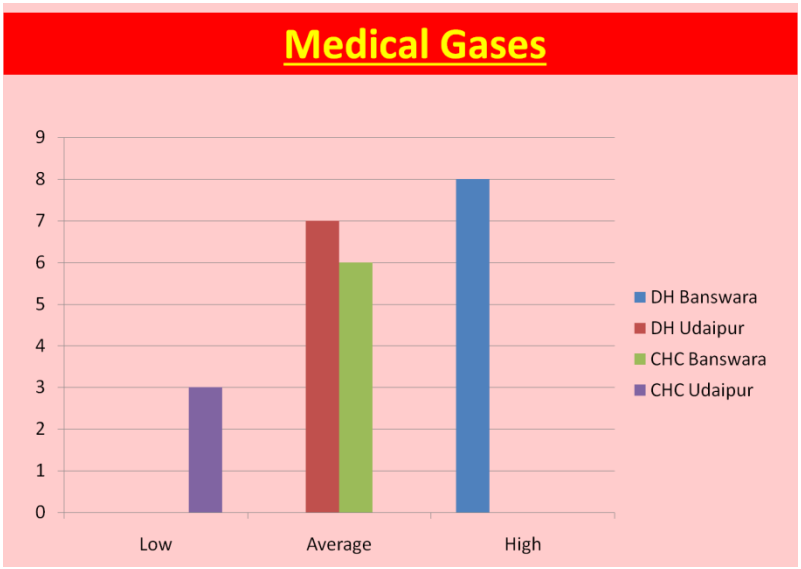
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.47 Medical gases



Both DH Udaipur including CHC should ensure that Procedures exist, personnel have been trained, and resources are in place to implement them with regards to medical gases

127. **Standard and back-up communications systems**

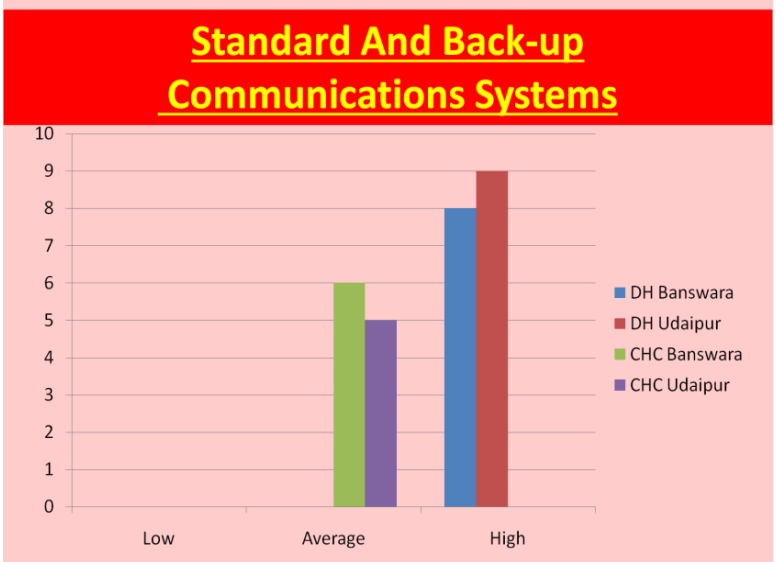
(a) Low = Procedures do not exist or exist only in a document

(b) Average = Procedures exist and personnel have been trained

(c) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.48 Standard and back-up communications systems



Both CHC Banswara and CHC Udaipur should ensure Procedures exist, personnel have been trained, and resources are in place to implement them for Standard and back-up communications systems

128. **Wastewater systems**

(a) The maintenance division should ensure that hospital wastewater drains into the public sewage system and does not contaminate drinking water.

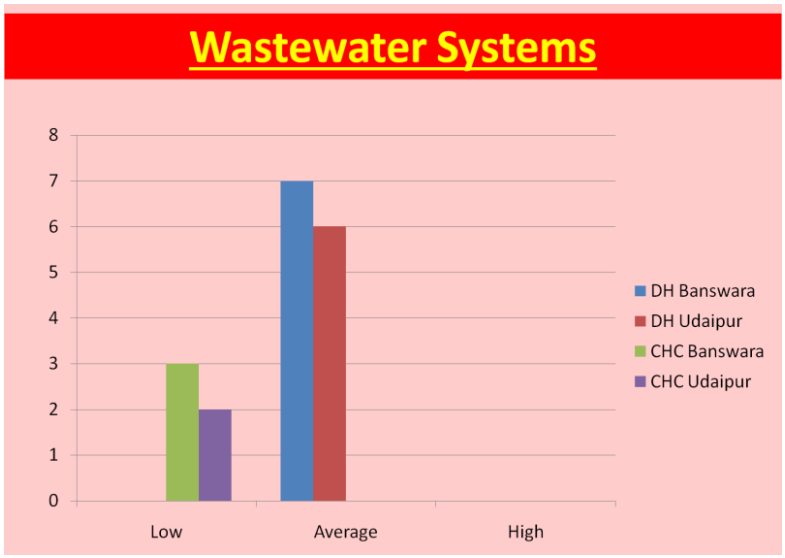
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara		Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.49 Wastewater systems



- Both DH Banswara and DH Udaipur including CHC should ensure proper waste water systems

129. **Solid waste management**

(a) The maintenance division should provide the operations manual for solid waste management, as well as records showing waste collection and subsequent disposal.

(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.50 Solid waste management

- Both CHC Banswara and CHC Udaipur should ensure proper solid waste management

130. **Maintenance of the fire protection system**

(a) The maintenance division should provide the operations manual & records for the fire protection systems showing preventive maintenance on fire extinguishers.

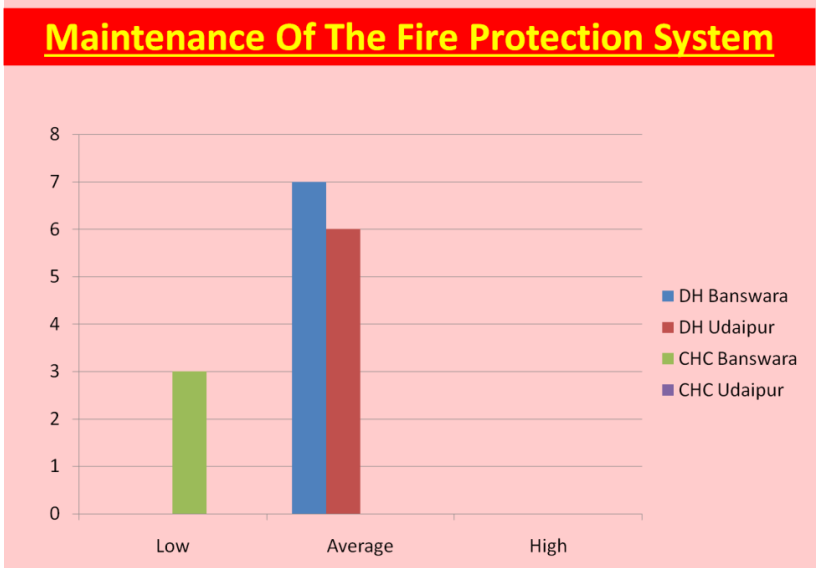
(i) Low = Procedures do not exist or exist only in a document

(ii) Average = Procedures exist and personnel have been trained

(iii) High = Procedures exist, personnel have been trained, and resources are in place to implement them

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	Yes	-	-	Low
CHC Banswara	-	Yes	-	Average

A.51 Maintenance of the fire protection system



- Both DH Banswara and DH Udaipur including CHC should ensure proper maintenance of fire protection system

Availability Of Medicines, Supplies, Instruments, And Other Equipment For Use In Emergency Verify The Availability Of Essential Supplies In The Event Of An Emergency

131. **Medicines**

(a) Check the availability of emergency medicines. The WHO list of essential drugs can be used as a reference.

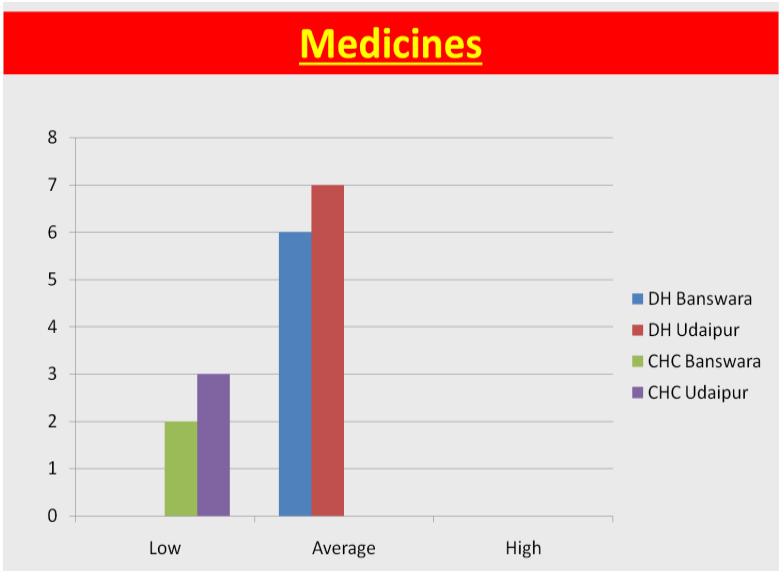
(i) Low = Nonexistent

(ii) Average = Supply covers less than 72 hours

(iii) High = Supply is guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.52 Medicines



Both DH Banswara and DH Udaipur including CHC should ensure that the medical Supply is guaranteed for at least 72 hours

132. **Items for treatment and other supplies**

(a) Check that the sterilization unit has a supply of sterilized materials for use in an emergency (check the supply prepared for the following day).

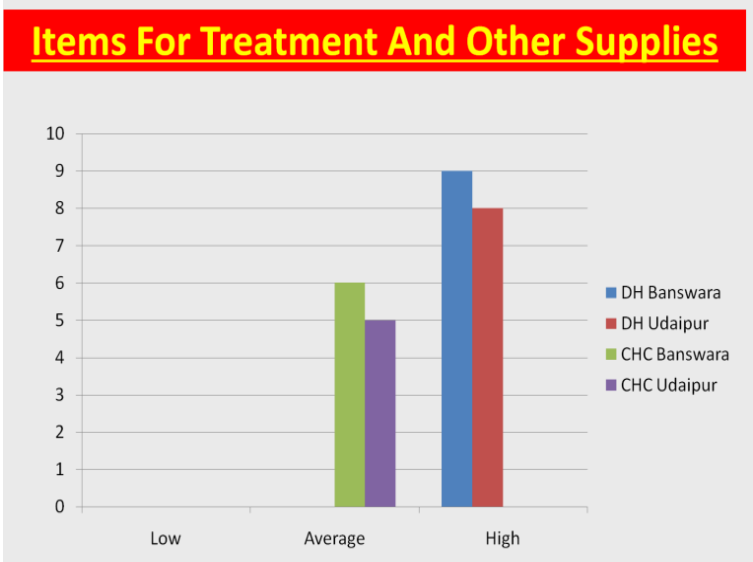
(i) Low = Nonexistent

(ii) Average = Supply covers less than 72 hours

(iii) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.53 Items for treatment and other supplies



Both CHC Banswara and CHC Udaipur should ensure that the Supply of items for treatment and other supplies guaranteed for at least 72 hours

133. **Instruments**

(a) Verify the existence and maintenance of specific instruments used in emergencies.

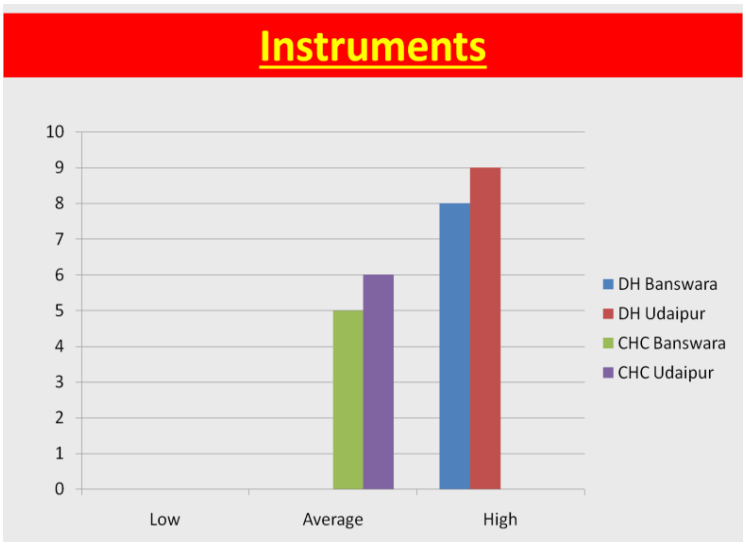
(i) Low = Nonexistent

(ii) Average = Supply covers less than 72 hours

(iii) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.54 Instruments



- Both CHC Banswara and CHC Udaipur should ensure that the Supply of instruments are guaranteed for at least 72 hours

134. **Medical gases**

(a) Verify the phone numbers and addresses of medical gas supplier and ensure availability in an emergency from the supplier.

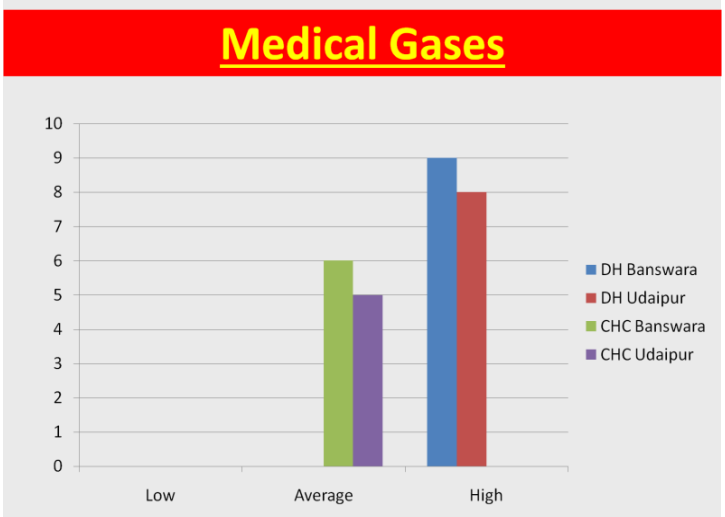
(i) Low = Nonexistent

(ii) Average = Supply covers less than 72 hours

(iii) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	-	Yes	-	Average
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.55 Medical gases



Both CHC Banswara and CHC Udaipur should ensure that the medical gases Supply guaranteed for at least 72 hours

135. **Mechanical volume ventilators**

(a) The Hospital Disaster Committee should provide documentation on quantity and conditions of use of this equipment.

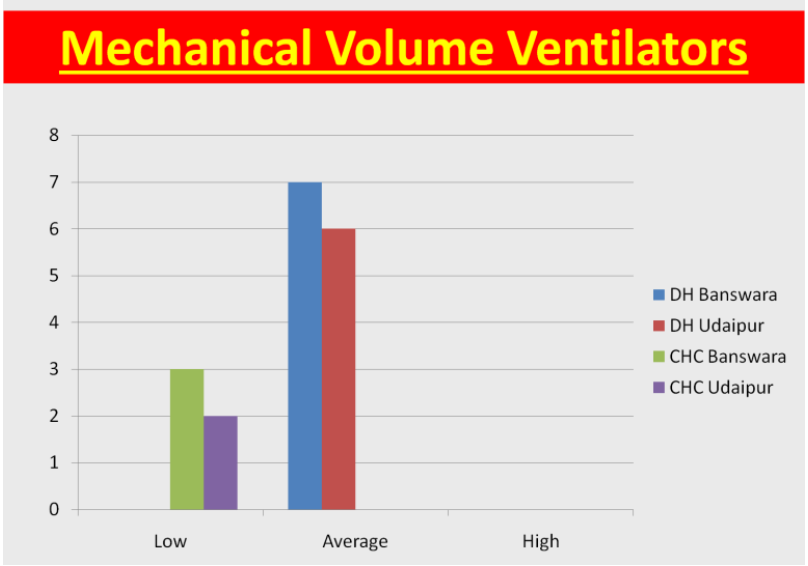
(i) Low = Nonexistent

(ii) Average = Supply covers less than 72 hours

(iii) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.56 Mechanical volume ventilators



Both DH Banswara and DH Udaipur including CHC should ensure that Supply of mechanical volume ventilators guaranteed for at least 72 hours

136. **Electro-medical equipment**

(a) The Hospital Disaster Committee should provide documentation on quantity and conditions of use of this equipment.

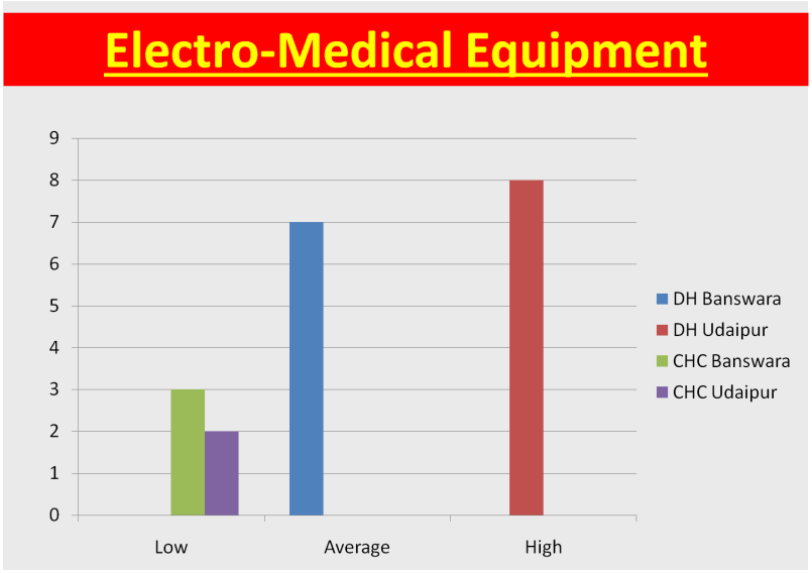
(i) Low = Nonexistent

(ii) Average = Supply covers less than 72 hours

(iii) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	Yes	-	-	Low
CHC Banswara	-	Yes	-	Average

A.57 Electro-medical equipment



Both DH Banswara and CHC Udaipur and CHC Banswara should ensure that Supply of electro medical equipment is guaranteed for at least 72 hours

137. **Life-support equipment**

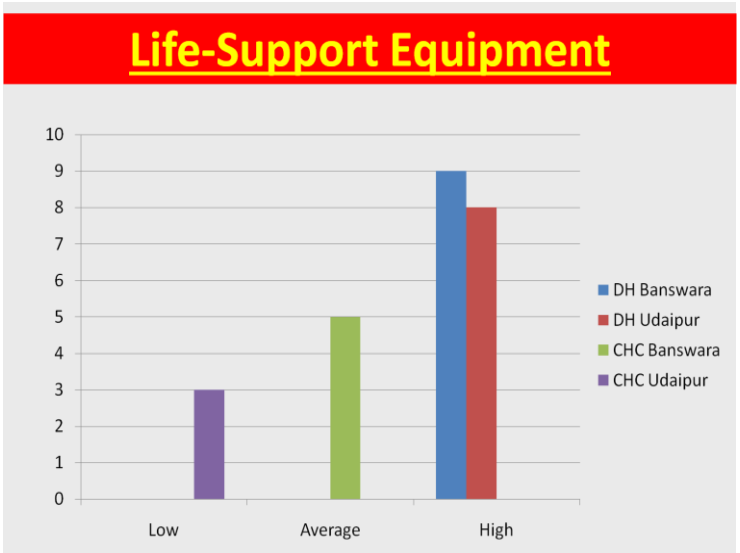
(a) Low = Nonexistent

(b) Average = Supply covers less than 72 hours

(c) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	-	Yes	-	Average

A.58 Life-support equipment



Both CHC Banswara and CHC Udaipur should ensure that the Supply of life support equipment is guaranteed for at least 72 hours

138. **Crash cart for cardiopulmonary arrest**

(a) The Hospital Disaster Committee should provide documentation on quantity, conditions of use, and locations of crash carts for treatment of cardiopulmonary arrest.

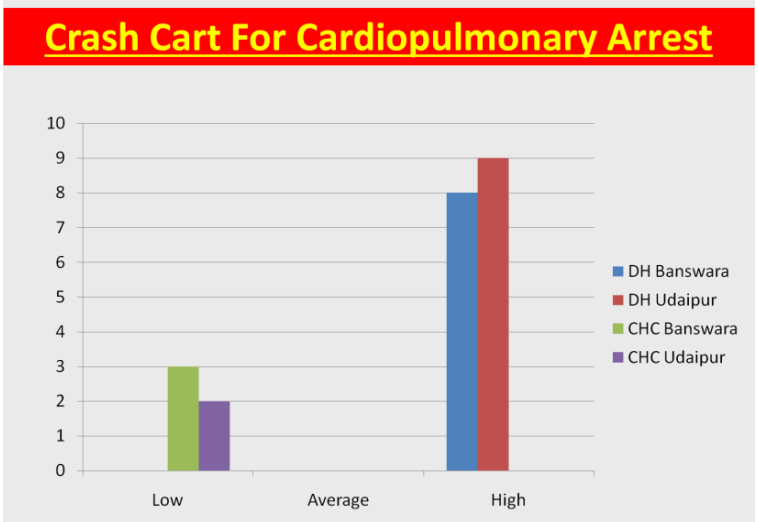
(i) Low = Nonexistent

(ii) Average = Supply covers less than 72 hours

(iii) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	-	Yes	High
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	-	Yes	High
CHC Banswara	Yes	-	-	Low

A.59 Crash cart for cardiopulmonary arrest



- Both CHC Banswara and CHC Udaipur should ensure that the Supply of crash cart for cardio pulmonary arrest is guaranteed for at least 72 hours

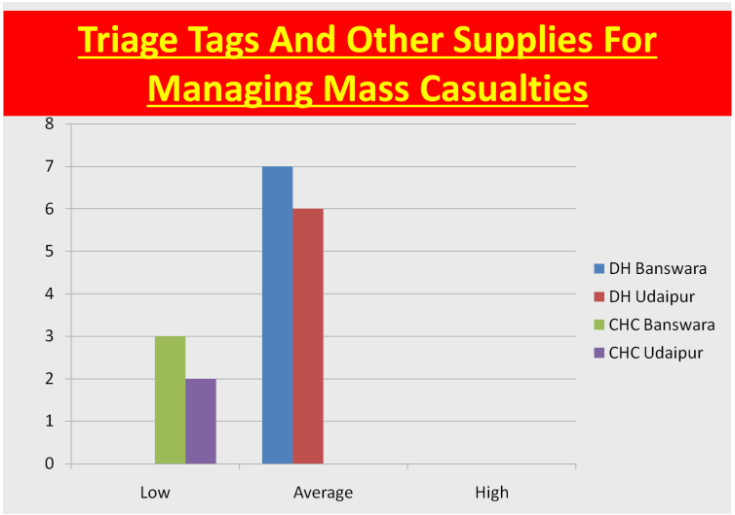
139. **Triage tags and other supplies for managing mass casualties**

(a) The emergency department distributes and uses triage tags in case of mass casualties. Evaluate the supply in terms of the maximum capacity of the hospital.

(i) Low = Nonexistent
(ii) Average = Supply covers less than 72 hours
(iii) High = Supply guaranteed for at least 72 hours

	Level of Implementation			
	Low	Average	High	Overall Percent
DH Udaipur	-	Yes	-	Average
CHC Udaipur	Yes	-	-	Low
DH Banswara	-	Yes	-	Average
CHC Banswara	Yes	-	-	Low

A.60 Triage tags and other supplies for managing mass casualties



- Both DH Banswara and DH Udaipur including CHC should ensure regular the Triage tags and other supplies for managing mass casualties

Summary of Scores Obtained by Government Health Care Facilities

140. The summary of scores (percentage wise) by the Government Health Care Facilities in Udaipur and Banswara Districts are as under:-

	Summary (Score out of 60 elements/standards with equal weightage)			
	DH Udaipur	**CHC Udaipur**	**DH Banswara**	**CHC Banswara**
Low (Inadequate)	**08 (14%)**	**32 (53%)**	**13 (21%)**	**37 (60%)**
Average(At Risk)	**20 (33%)**	**25 (42%)**	**26 (44%)**	**22 (38%)**
High (Functional)	**32(53%)**	**03 (05%)**	**21 (35%)**	**01 (2%)**
Score (out of 10)	**09**	**02**	**07**	**03**
Remarks	**Functional (A)**	**Inadequate (C)**	**Average(B)**	**Inadequate (C)**

CHAPTER 6: DISCUSSION AND RECOMMENDATIONS

141. **Discussion.** The evidence from the study and major findings suggests the following :-

(a) **Scoring Pattern (Safety Based on Functional Capacity of Hospital (HCF)**

(i) **Inadequate (Low)** : 0- 3 points.

(ii) **At Risk (Average)** : 4 -7 points.

(iii) **Functional (High)** : 8-10 points.

(b) Hospital Safety Index Score (duly modified) based on functional capacity necessitates under mentioned measures:-

(i) **Inadequate (Low) C = 0 – 0.39 (upto 39%)** Necessary and urgent measures must be taken immediately, as the health care facility's current level of safety is insufficient to protect patients and staff during and after a disaster or emergency.

(ii) **At Risk (Average) B = 0.40 – 0.79 (40 - 79%)** Short-term measures are required, as the health care facility's current level of safety could potentially put patients, staff and the facility's ability to function at risk during or after a disaster or emergency.

(iii) **Functional (High) A = 0.80 – 1 (80- 100%)** Although it is likely that the hospital (health care facility) will continue to function in emergency situations, it is recommended that measures continue to be taken in the medium and long term to reduce risk and incorporate mitigation measures particularly for overall functional safety.

142. **Recommendations**

At State Govt Level

(a) There needs to be concerted efforts made by the Rajasthan State government health authorities to make the level of disaster preparedness and safety plans more effective and responsive of the four Health Care Facilities(HCF).

(b) Operational and functional resilience of government hospitals in Rajasthan to be addressed properly.

(c) Make hospitals safe and resilient to future risks, including climate change in the districts of Banswara and Udaipur.

(d) Integrate disaster risk reduction (DRR) into the health sector and implement mitigation measures to reinforce existing health facilities by the health authorities in Rajasthan Government.

(e) Establishment of the Hospital Emergency Incident Command System (HEICS), a management structure concept propounded by USA to identify responsibilities, reporting connections, and a common designation to help combine government hospitals in all the districts of Rajasthan with other emergency responders (suitably modified to suit Indian Health Care requirements).

(f) Rajasthan State government requires to formulate State Disaster Management Plans (SDMPs) which detail how to prepare, mitigate, respond and recover from disasters. Ensure its implementation by government Health Care Facilities.

(g) The Health Care Facilities need to follow the guidelines as per the National Action Framework for Hospital Safety issued by GoI.

At District HQ Level

(h) District HQ authorities need to enable government Health Care Facilities in Districts of Banswara and Udaipur to continue to function and provide appropriate and sustained levels of healthcare during and following emergencies and disasters.

(i) Emergency Response Plans need to be developed and maintained for each of the emergencies identified as priorities in the HRVA and monitored periodically at District HQ level (Civil Surgeon and Director of health services).

(j) Protect the physical integrity of hospital buildings, equipment and critical hospital systems by periodic inspections and visits by concerned authorities.

(k) Mitigation, Preparedness and Recovery Plans: Emergency Response Plans should include the activity designed to mitigate the impact of the emergency, such as medical specialized equipment, and to prepare for the emergency with activities including staff training, adequate supplies, and equipment for responding the potential emergency, and plans to handle the space and facilities during emergency situations.

(l) Disaster management plans should be evaluated at the two districts of Banswara and Udaipur on an ongoing basis at least annually. The appraisal should identify components of the program that need to be instituted, revised or deleted. The report should be submitted to State Government for assistance and needful directions on the lapses if any.

At Health Care Facility(HCF) Level

(m) Organization of disaster committee and emergency operation centre should be made more effective and responsive by DH Banswara and CHCs of Banswara and Udaipur.

(n) Operational plans for internal and external disasters should be reviewed periodically and made up to date with regular practice and rehearsals at appropriate levels by all the four Health Care Facilities (HCF).

(0) Contingency plans for medical treatment during disasters should be ready at all times by the DHs and CHCs respectively.

(p) Plans for operation, maintenance and restoration of critical services is essential to ensure high degree of functional capacity.

(q) Adequate availability of medicines, supplies, instruments and other equipment required during emergencies be catered for by DH Banswara and CHCs of Banswara and Udaipur.

(r) A well documented Hospital Disaster Management Plan should be formulated by all the four Health Care Facilities (HCF).

(s) Ensure adequate or complete plans of internal and external communication is maintained bt the DHs and CHCs respectively.

(t) Lifelines such as electricity, water and sanitation and waste treatment and disposal of medical wastes are important to ensure continuity of operations during an emergency situation by DH Banswara and CHCs of Banswara and Udaipur.

(u) Management plan should describe the processes it implements to effectively manage emergencies affecting the facility, patients, staff, and to respond to emergencies in the community that cause an influx of patients.

(v) The Emergency Response Plans of the four Health Care Facilities (HCF) should include the specifics of the response, including job assignments, staffing strategies and the management of patients, both victims of the emergency and existing patients.

(w) The disaster preparedness plan by these facilities should address the management of patient care activities.

(x) A facility evacuation plan should be in place and needs to be implemented in phases in both the districts of Banswara and Udaipur

CHAPTER 7: CONCLUSION

143. As seen above there are many factors based on functional capacity which put hospitals and health care facilities at risk. Functional collapse, not structural damage, is the usual reason for hospitals being put out of service during emergencies. Functional collapse occurs when the elements that allow a hospital (Health Care Facility) to operate on a day-today basis are unable to perform because the disaster has overloaded the system. These include: architectural spaces such as laboratories or operating theatres; medical records; medical and support services; and administrative processes (such as contracting, procurement, and maintenance routines). Although the measures necessary to prevent a functional collapse (such as contingency planning, improved organisation and staff training) require a significantly smaller financial investment, they nonetheless remain a major challenge.

144. Hospitals and health care facilities can be built to different levels of protection. Life safety is the minimum level of protection and is the most common approach to protection in the construction of health facilities. Preparation and Implementation of Hospital Disaster Management Plan Focus on responsive health services ensures that the facility resumes operations within a reasonable timeframe and cost. Operations and functional protection, which is the most costly level, includes life and investment protection but also seeks to ensure the facility continues to function after a disaster. Creating safe hospitals (Health Care Facility) is as much about having vision and commitment as it is about actual resources.

145. The responsibility of creating safe hospitals (Health Care Facility) must be shared among many sectors to include planning, finance, public works, urban and land-use planning, together with the health sector. The political will to make this happen must match the knowledge that already exists.

146. ***The most costly hospital (Health Care Facility) is the one that fails during disasters !***

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