सत्यमेव जयते
NITI Aayog

Emergency and Injury Care at District Hospitals in India

A Report of Current Status on Country Level Assessment

ALL INDIA INSTITUTE OF MEDICAL SCIENCES
शरीरमाद्यं खलु धर्मसाधनम्

Emergency and Injury Care at District Hospitals in India

A REPORT OF CURRENT STATUS ON COUNTRY LEVEL ASSESSMENT

PROJECT REPORT SUBMITTED TO
NITI Aayog, New Delhi

This study was carried out with the financial support of
NITI Aayog, Government of India,
and *conducted by*
Department of Emergency Medicine,
JPNATC, AIIMS.

DISCLAIMER

Department of Emergency Medicine, JPNATC, AIIMS has received the financial assistance under the Research Scheme of NITI Aayog (RSNA 2018) to prepare this report. While due care has been exercised to prepare the report using the data from various sources, NITI Aayog does not confirm the authenticity of data and accuracy of the methodology to prepare the report. NITI Aayog shall not be held responsible for findings or opinions expressed in the document. This responsibility completely rests with the Department of Emergency Medicine, JPNATC, AIIMS.

डॉ. विनोद कुमार पॉल
सदस्य
Dr. Vinod K. Paul
MEMBER

सत्यमेव जयते

भारत सरकार
नीति आयोग, संसद मार्ग
नई दिल्ली–110 001
Government of India
NATIONAL INSTITUTION FOR TRANSFORMING INDIA
NITI Aayog, Parliament Street
New Delhi-110 001
Tele. : 23096809 Fax : 23096810
E-mail : vinodk.paul@gov.in

22nd July, 2021

Foreword

Care of emergency and accident patients is of paramount importance in saving lives, preventing disability and for achieving the intended health goals of the Nation. However, accident and emergency services in India has witnessed uneven progress. Given its extraordinary importance, it is time that India embarks on creating a world-class, efficient, professional and integrated system, enabled by technology, for the care any victim of accident, emergency or trauma in any part of the country.

To understand the imperatives in realizing this goal, NITI Aayog, jointly with Ministry of Health & Family Welfare (MoHFW) conducted field visits and held multi-stake holder meetings. It emerged from these deliberations that a pan-India study to assess gaps in optimal delivery of emergency care services was a crucial starting point. Accordingly, NITI Aayog commissioned Emergency Medicine Department, AIIMS, New Delhi to conduct a Nation-wide assessment of prevailing emergency care system in India.

I am happy to note that the study which involved 34 District Hospitals representing all the zones of the Nation, has been completed. Besides highlighting the spectrum and load of emergency cases, it brings out the prevailing gaps in ambulance services, health infrastructure, human resources and equipment in the provision of optimal care. I complement the team for conducting live observations of various processes involving efficiency of time-bound procedures, patient satisfaction reports. Medico-legal burden, adherence to protocols and data-entry operations.

My congratulations to the AIIMS team for successful completion of the project and the teams from NITI Aayog and Ministry of Health & Family Welfare for their useful contribution in bringing out this timely report. The learnings from this study would be useful for developing vision and plans toward creating world-class emergency care in the country.

(Vinod Paul)

स्वच्छ भारत
एक कदम स्वच्छता की ओर

शरीरमाद्यं खलु धर्मसाधनम्

अखिल भारतीय आयुर्विज्ञान संस्थान
अंसारी नगर, नई दिल्ली-110029, भारत

All India Institute of Medical Sciences
Ansari Nagar, New Delhi-110029, India

दूरभाष/Phones :(का./Off.): +91-11-26588000, 26594800, 26594805
फैक्स सं./Fax No.: +91-11-26588663, 26588641
Phone (नि./ Res.) +91-11-26594500
ई–मेल/E-mail : director.aiims@gmail.com

आचार्य रणदीप गुलेरिया, पदमश्री
निदेशक

PROF. RANDEEP GULERIA, Padma Shri
MD, DM (Pulmonary Medicine), FAMS, FIMSA,
DIRECTOR

26th December, 2020

MESSAGE

Emergency conditions such as Acute coronary syndrome, stroke, respiratory diseases, maternal and pediatric emergencies and injuries are the leading causes of death and disabilities in India. Trauma is the leading cause of death among young, who often are the sole bread earner of the family.

The landscape of emergency care includes timely access and acute care delivery to critically ill and injured patients. Premature death and Disability Adjusted Life Years (DALYs) can be prevented by establishing robust integrated emergency care system with definitive care.

In this study, 34 district hospitals were randomly selected from 28 states and 2 union territories of our Country and were assessed by team of assessors.

This study aims to find the available gaps in the emergency and injury care system in the healthcare facilities, both in government and private sector. It also studied the linkages between pre-hospital care and hospital care in India.

I strongly believe that the outcomes of this study will provide the policy inputs to improve and strengthen the emergency care services at district hospital level in India. I congratulate the researchers for conducting this very important study.

(Prof. Randeep Guleria)

ACKNOWLEDGEMENT

We wish to express our sincere gratitude to all who helped us to complete this project in an efficient time-bound manner. This study was carried out by Department of Emergency Medicine, JPNATC, AIIMS, with the financial support of NITI Aayog, Government of India.

At the outset, we like to thank Dr V K Paul, Member, National Institution for Transforming India who provided useful insights in conceiving this study and guiding throughout various processes. We would like to thank to Dr Madan Gopal, Sr. Consultant, NITI Aayog for his kind support and co-operation both during this study and submission of its report.

This study would not have been possible without the continued support. dedication and constant engagement of all our research staff and team of national assessors, especially given the limited time frame.

We would also thank all the nodal officials and all the staff of various hospital sites, who were immensely cooperative in providing the needful inputs for the study, whenever our team reached out to them.

Our special thanks to the teams representing our key stakeholders from the Ministry of Health and Family Welfare and NITI Aayog, for their valuable contribution and time.

Finally, we thank the God almighty for giving this opportunity to successfully conduct this study; which we hope, would bear an important imprint for making key policy decisions to deliver optimal emergency care for the Nation.

Team of Investigators
JPNATC
AIIMS, New Delhi

LIST OF INVESTIGATORS AND CONTRIBUTORS

S. No.		Name	Designation	Organization
PRINCIPAL INVESTIGATOR				
1		**Dr Sanjeev Kumar Bhoi**	Professor	Department of Emergency Medicine, JPNATC, AIIMS, New Delhi
CO-INVESTIGATORS				
2		**Dr Praveen Aggrawal**	Professor & HOD	Department of Emergency Medicine, AIIMS, New Delhi
3		**Dr Tej Prakash Sinha**	Associate Professor	Department of Emergency Medicine, JPNATC, AIIMS, New Delhi
CONTRIBUTORS				
4		**Dr Tanu Jain**	Deputy Director General	Directorate General of Health Services, Nirman Bhawan, New Delhi
5		**Dr S Rajesh**	IFS, Chief Conservator of Forests Former Director (Health)	Govt. of Arunachal Pradesh NITI Aayog, Govt. Of India, New Delhi
6		**Dr K Venkatnarayan**	Officer on Special Duty	National Institute of Transforming India (NITI) Aayog
RESEARCH OFFICERS				
7		**Ms Dolly Sharma**	Research Officer	Department of Emergency Medicine, JPNATC, AIIMS, New Delhi
8		**Dr Monica Sindhu**	Research Officer	

ABBREVIATIONS

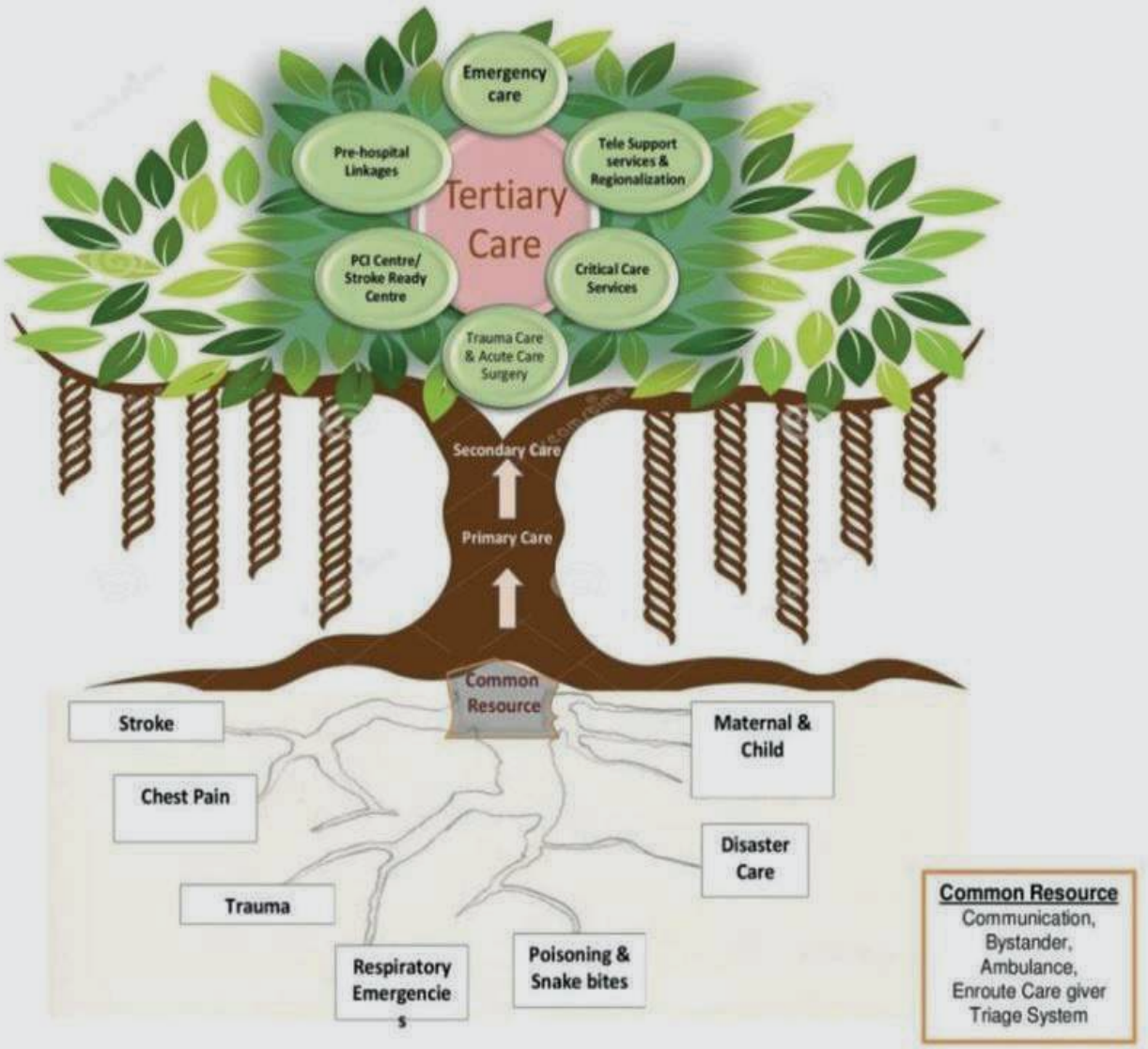
ACLS	Advanced Cardiac Life Support
AIIMS	All India Institute of Medical Sciences
ALS	Advanced Life Support
AMBU	Artificial Manual Breathing Unit
APTT	Activated Partial Thromboplastin Time
ATLS	Advanced Trauma Life Support
BLS	Basic Life Support
Ca	Calcium
CABG	Coronary Artery Bypass Grafting
CCU	Critical Care Unit
CD	Communicable Disease
Cl	Chlorine
CMO	Chief medical officer
CT	Computerized Tomography
DALYs	Disability-Adjusted Life Years
DLC	Differential Leucocyte Count
DNB	Diplomat of National Board
DSA	Digital Subtraction Angiography
ECG	Electrocardiogram
ECS	Emergency Care System
ED	Emergency Department
EHR	Electronic Health Record
EM	Emergency Medicine
EMS	Emergency Medical Services

EMT	Emergency Medical Technician
ER	Emergency Room
ETAT	Emergency Triage Assessment and Treatment
FFP	Fresh Frozen Plasma
GDA	General Duty Attendant
GDP	Gross Domestic Product
GHE	Global Health Estimates
GVK	Gunupati Venkata Krishna Reddy
HA	Hospital Attendant
Hb	Hemoglobin
Hct	Hematocrit
HDU	High Dependency Unit
HMRI	Hai Medicare and Research Institute
ICU	Intensive Care Unit
INDUSEM	INDO-US Emergency Medicine
INR	International Normalized ratio
IPD	In-Patient Department
IPGMER	Institute of Post-Graduate Medical Education and Research
IQR	Interquartile Range
ITU	Intensive Treatment Unit
IV	Intra-venous
JPNATC	Jai Prakash Narayan AIIMS Trauma Centre
JR	Junior Residents
K	Potassium
LAMA	Left Against medical Advice
LMA	Laryngeal Mask Airway
LMICs	Lower Middle Income Countries
MCI	Medical Council of India
MLC	Medico legal Cases
MO	Medical Officer
Na	Sodium
NABH	National Accreditation Board for Hospitals & healthcare Providers
NCD	Non-Communicable Disease
NITI	National Institution for Transforming India
OPD	Out Patient Department
OT	Operation Theatre
PALS	Pediatric Advanced life Support
PCI	Percutaneous Coronary Intervention

PEF	Peak Expiratory Flowmeter
Pro-BNP	N-terminal B-type Natriuretic Peptide
PT	Platelet Transfusion
RBC	Red blood Corpuscles
RTI	Road Traffic Injury
SA	Sanitary Attendant
SAC	Scientific Advisory Committee
SD	Standard Deviation
SEAR	South East Asian Regions
SOP	Standard Operating Procedures
SPSS	Statistical Package for the Social Sciences
SR	Senior Residents
SSG	Sir Sayaji General
SSKM	Seth Sukhlal Karnani Memorial
STNM	Sir Thutob Namgyal Memorial
TEG	Thromboelastogram
TLC	Total Leucocyte Count
Trop-I	Troponin I
Trop-T	Troponin T
U.S.	United States
USG	Ultrasound/Sonography
WHO	World Health Organization

TABLE OF CONTENTS

EXECUTIVE SUMMARY 01



01

EXECUTIVE SUMMARY

Medical emergencies including Road Traffic Injuries are one of the major leading causes of deaths in India. RTIs alone contribute to 1.5 Lakh deaths annually. Approximately 2 persons died of heart attack every hour in 2015-16. Currently, Non Communicable Diseases alone account for ~62% of deaths in India and Communicable infections, Maternal, New born account for ~27% of deaths. Most of these deaths present as emergency conditions. In fact, as per one estimate more than 50% of deaths and 40% of total burden of disease in Low Middle Income Countries could be averted with pre-hospital and emergency care. The global total addressable deaths and DALYs that can be averted amount to 24.3 million and 1023 million lives respectively. In fact, in South-East Asia alone, 90% of deaths and 84% of disability-adjusted life years (DALYs) are due to emergency and trauma conditions.

Emergency care system in our country has seen uneven progress. Some states have done well, while others are still in the budding stages. Overall, it suffers from fragmentation of services from pre-hospital care to facility-based care in government as well as in the private sector. The system also suffers from lack of trained human resource, finances, legislation and regulations governing the system.

Absence of standalone academic department since its inception is another factor for the current ails in the system.

In the light of the above, the present study was conducted. The study aimed to assess the prevailing status of emergency and trauma care at government and private hospital settings of India to bring out the existing gaps and provide a framework for further improvement and the needed policy directions. Towards achieving this goal, a country-wide study of emergency and trauma care services of 34 secondary level district hospitals in 29 States and 2 Union Territories from 5 regions of India was conducted.

The selected health facilities consisted of 34 healthcare facilities: 15 District Hospitals >300 bed strength and 19 District Hospitals <300 bed strength. The assessments were conducted by trained assessors, selected from all over country who followed by the investigators and research team.

SALIENT FINDINGS OF THE STUDY

Case load

- Emergency and injury cases annually accounted for 16% of all patients presenting to a health facility and 19-36% of admissions in district Hospitals.
- Live observations revealed that emergency cases accounted for 10-12% of all OPD patients on a given day.

Spectrum of major medical conditions presenting at Emergency Departments

- During live observations conducted for 24 hours at the study centres, the following were the most common spectrum of cases encountered at the EDs:
  - Adult patients (n = 1312): Fever (29%), Pain Abdomen (22%), Trauma and road-traffic injuries (18%), Respiratory Distress (9%), Chest Pain (8%), Pregnancy-related (7%), altered mental status (6%), Stroke (5%), Snake bite (5%) and Poisoning (3%).
  - Pediatric patients (n = 250): Diarrhoea (6%), Trauma and road traffic injuries (5%), Fever (5%), Pain abdomen (4%), Respiratory distress (3%), Seizures (3%), Snake bite (2%) and altered mental status (1%).

Ambulance Services

- Even though 88% of hospitals had in-house ambulances, trained paramedics needed to assist ambulance services were present only in 3%.
- Provision of specialized care during ambulance transport were largely poor: only 12% hospitals had mobile Stroke/ STEMI (for heart attack) program.
- Most of the hospitals lacked Pre-hospital arrival notification system.

Physical Infrastructure

- Despite high patient load reporting to the EDs, the number of beds available at Emergency Departments accounted for only 3-5% of total hospital beds.
- Amongst the critical infra-related quality parameters assessed in the EDs, the following were important deficiencies: absence of point of care lab (94%), demarcated triage area (94%), police control room (47%), separate access for ambulance (76%) and adequate spacing for emergency department (68%).

Human Resource

- Most of the hospitals lacked presence of general doctors, specialists and nursing staff dedicated for Emergency Departments vis-à-vis the average footfall of patients, even though, the hospitals as such, had sufficient overall numbers of required human resource.
- Besides, when present, most of the EDs were manned by junior doctors rather than specialists.

Equipment status

- Compliance with availability of overall recommended biomedical equipment and critical equipment were largely deficiencies district hospitals (45-60%).
- Specifically, equipment deficiencies pertained largely to the category of Pediatric-care (96%). Equipments pertaining to Airway, Breathing, Circulation and General categories had deficiencies pertaining to a few sets of specific equipments (3-97%).

Essential Medicines

- Since it is essential to have the complete list of all recommended emergency medicines 24*7 in the emergency departments, assessment done for this aspect revealed that none of the district hospital, fulfilled this criterion.

Definitive Emergency Specialized Care

- Amongst study of definitive care services, availability of emergency operative care services (for trauma, non-trauma, orthopedic, neurosurgical, obstetric care) varied between 6-41% depending on the type of services.
- Similarly, critical care services (involving intensive care services such as ICU, HDU, PICU, NICU, CCU, Neuro ICU) varied across hospital facilities, but were typically largely deficient at smaller District Hospitals.

Blood Bank services

- An in-house 24*7 functional Blood Banks were available in 50% of District Hospitals.
- Most of the Hospitals did not have a dedicated Blood Bank in the Emergency Department nor an existing standard protocol for massive blood transfusion.

Patient disposition time (Live observation)

- The patient disposition time for the sickest group (Red zone) was high at District Hospitals >300 beds (205 Minutes).
- On study of efficiency of various time-bound procedures that need to be conducted for optimal management of Chest Pain, Stroke and Trauma; most of the District Hospitals fared worse.
- Violence between relatives of the care-seekers and health care providers were noticed 47% of hospitals. The reasons were largely due to delay in providing care.
- Most of the District Hospitals lacked facilities such as presence of Police/ private security guards, to mitigate such violence episodes.

Patient Satisfaction (Live observation)

- Patients availing emergency care at District Hospitals were moderately satisfied with the services provided (23-67%).

MLC Burden

- The burden of Medico-legal cases (MLC) was 3-6.5% of all admissions.

ED protocols, Quality measures and Disaster planning

- Most of the District Hospitals lacked SOPs/standard manuals for emergency care, patient transfer-in/out and handling of death. Further, policies for triaging (17%) and disaster management were found only in 26% of District Hospitals.
- Specific protocols for definitive care for chest pain, suspected sepsis, stroke, trauma and cardiac arrest were found lacking across hospitals. Similar patterns were seen for Disaster management planning and systems to enforce continuous quality improvements.

Computerized data entry systems

- Though computerized patient registration system were present at most of the hospitals; specific computerized systems for electronic health records, patient clinical examination notes, lab investigation reports and for data retrieval for research were largely deficient in most of the District Hospitals.
- Most of the hospitals lacked trauma registry and systems for surveillance of trauma and Emergency Care.

Financing

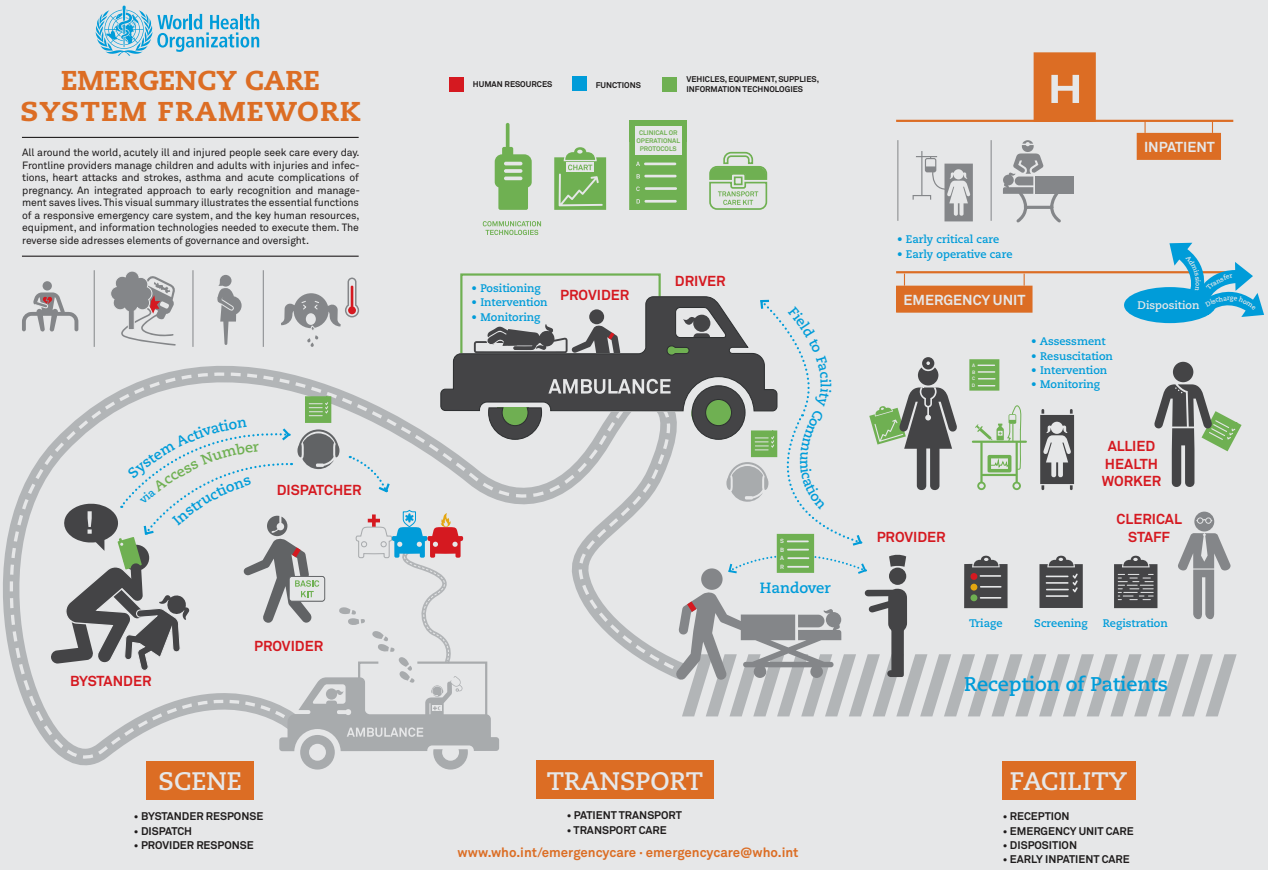
- None of the Hospitals had funds dedicated for emergency care services. A few of the Hospitals received funds as part for delivery of trauma-care.

KEY RECOMMENDATIONS

1. Develop a robust integrated emergency care service system which can comprehensively address all medical, surgical emergencies inclusive of trauma-related care.
2. Standardize protocols, SOPs for emergency care, inclusive of triage to have a common optimal nation-wide policy.
3. Strengthen the prevailing pre-hospital services such that a world-class ambulance services are made available 24*7, encompassing on-going definitive care through effective paramedics, for all citizens of the country and, these should be optimally integrated with hospital care with an efficient pre-hospital arrival system using latest Information Technologies.
4. Create adequate space for emergency care systems at the prevailing health facilities such that standardized emergency departments with recommended proportion of beds, infrastructure, equipment, drugs and human resources become a norm.
5. Systems to ensure efficient handling of medical care during disasters need to be ensured at all hospitals.
6. Expand Blood Bank related services such that even smaller Government Hospitals are ensured timely availability of on-demand blood and its related products.

7. Upgrade all the prevailing emergency care services to meet the standardized norms, with efforts made to accredit all the existing emergency departments. All medical colleges should attain self-sufficiency in providing definitive care for all emergency-related conditions.
8. Establish Academic Emergency Medicine departments to ensure continuous ongoing medical education and development of skills for doctors, nurses and paramedics.
9. Create standalone Central/ State level efficient funding mechanisms to ensure continuous upgradation of emergency related issues at all hospitals, with built-in mechanisms for periodic assessments to check optimal delivery of services.
10. Develop mechanisms to ensure free treatment for emergency care services for all citizens covering the minimal required period for early stabilization.

REVIEW OF LITERATURE 02



02

INTRODUCTION

The emergency care system and facility-based care in India are in its infancy. It suffers from the fragmentation of services from pre-hospital care to facility-based care both in government as well as in private sectors. The system also suffers from the lack of trained human resources, finances, legislation, and regulations governing the system.

The facility-based care in tertiary care lacks trained human resources due to the stunted growth of academic emergency medicine since its inception. The other allied disciplines such as emergency nursing and emergency medical technician are yet to take shape. Hence it is important to assess the existing gaps in facility-based emergency care and the linkages to the emergency care system in a representative stratified multi-stage random sample of 100 healthcare facilities across India. The study was a cross-sectional survey across the five regions of the country.

In the survey, a total of 34 district hospitals were assessed with the help of a Consensus-based tool (predesigned pretested data collection tool) for the data collection.

The project aims at country-level assessment of the gaps and linkages in emergency and injury care at government medical colleges, private hospitals and district hospitals of India. This study proposes:

1. To describe the burden of emergencies and injuries in the country
2. To identify and describe current gaps and suggest interventions to strengthen the emergency/injury care (Pre-hospital care, definitive care, referral and rehabilitation services)
3. Suggesting strategies to strengthen the emergency/injury care at the tertiary center level
4. Identification of prospects on strengthening/ establishing academic Emergency Medicine at Medical Colleges

The purpose of the report is to identify the gaps in emergency and injury care systems in healthcare facilities as well as to find out the linkages between the pre-hospital care and facility-based care system in our country. Based on the findings and outcomes from the study, suitable policies will be made to strengthen the emergency and injury care at the national level.

REVIEW OF LITERATURE 03

03

REVIEW OF LITERATURE

Emergency care can be defined as the delivery of time-sensitive interventions needed to avert death and disability and for which delays of hours can worsen prognosis or render care less effective.

All around the world, acutely ill and injured people seek care every day. Goal of an effective emergency medical system should be to provide universal emergency care — that is, timely quality emergency care should be available to all who need it.

However, there are many unfounded myths about emergency medical care, and these are often used as a rationale for giving it a low priority in the health sector, especially in low- and middle-income countries. These myths include equating emergency care to ambulances and focusing on transport alone while neglecting the role of care that can be provided in the community and at a health-care facility. Perhaps most common is the perception that emergency care is inherently expensive; this myth focuses attention on the high-technology end of clinical care as opposed to the strategies that are simple and effective. Efforts to improve emergency care, however, need not lead to increased costs for many people around the world, emergency care is the primary point of access to the health system, and is thus, essential to universal health coverage.

As per a study, injuries alone accounted for 14% of the burden of disease among adult in 2002. It is thus challenging to define the burden of disease addressed by emergency medical systems. Emergency medical system is a set of diseases encompasses of communicable infections, non-communicable conditions, obstetrics and injuries. Patients with all these conditions may present to the emergency medical system either in the acute stages (such as diabetic hypoglycaemia, septicaemia, premature labour or asthma) or may present with conditions that are acute in their natural presentation (such as myocardial infarction, acute haemorrhage or injuries)[1].

A recent study showed that all 15 leading causes of death and disability-adjusted life years (DALYs) globally were the conditions with potential emergent manifestations.[2]

By ensuring early recognition of acute conditions and timely access to needed care, organized emergency care systems save lives and amplify the impact of many other parts of the health system. The World Bank Disease Control Priorities Project estimates that Emergency care system (ECS) with sound organization, have the potential to address over half of deaths and a third of disability in low- and middle-income countries.[3]

Simple, low-cost interventions to strengthen timely emergency care delivery can have dramatic impact on clinical outcomes, and well-integrated emergency care has enormous potential to save lives even with limited input of new material resources.

BURDEN OF EMERGENCY CONDITIONS IN THE SOUTH-EAST ASIAN REGION

Despite tremendous improvement in health care delivery in the SEAR over recent decades, high rates of injuries and cardiovascular emergencies, now among the leading causes of death, co-exist with persistent high rates of infectious disease and maternal and infant mortality in some areas. Timely, quality emergency care prevents death and disability from all of these conditions, but ECS are still under-developed in many SEAR countries. 90% of deaths and 84% of DALYs were attributable to emergency conditions with South-East Asia having the second highest burden of emergency conditions (Figure1).

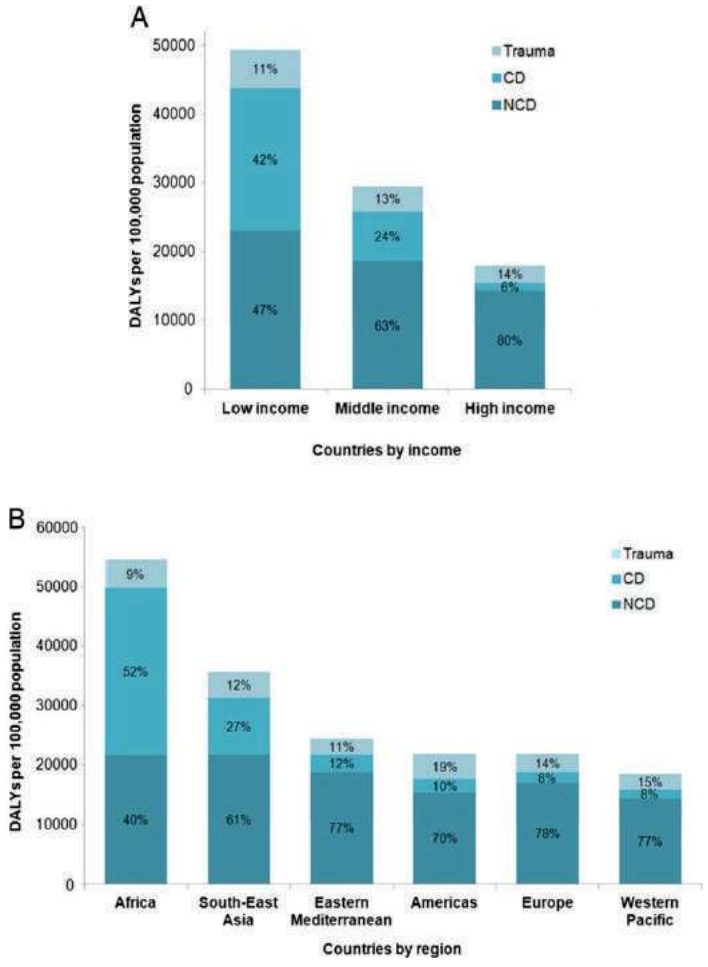


Figure 1: *DALYs per 100,000 population attributable to emergency conditions, by etiology: separated by income level (A) and region (B). Distribution of deaths was similar. NCDs, non-communicable diseases; CDs, communicable diseases; DALYs, disability-adjusted life years*[(2)]

***Source: Reference (2)*

WHO has projected the rise in the burden of various diseases causing death in SEAR in 2015 and 2030 (Table 1).This projection shows a significant decrease in mortality from communicable,

maternal, perinatal and nutritional causes from 25.2% to 16.1%. However, there is a projected rise in deaths due to non-communicable diseases (NCD) from 63.5% in 2015 to 72.5% in 2030, which is a cause for concern.[4]

Table 1: Projections of mortality by cause for 2015 and 2030[4]

Deaths (thousands) by cause projected to 2015 and 2030 in SEAR						
Year			**2015**		**2030**	
Population (thousands)			**1920761**		**2205146**	
GHE 2012 cause category			**Deaths**	**% Total**	**Deaths**	**% Total**
	All Causes		**14851**	**100**	**18595**	**100**
I.	**Communicable, maternal, perinatal and nutritional conditions**		3748	25.2	2998	**16.1**
II.	**Non-communicable diseases**		9428	63.5	13472	**72.5**
	A.	Cardiovascular diseases	4159	28.0	5872	**31.6**
	B.	Respiratory diseases	1712	11.5	2561	**13.8**
	C.	Malignant neoplasms	1412	9.5	2310	**12.4**
	D.	Diabetes mellitus	434	2.9	690	**3.7**
III.	**Injuries**		1676	11.3	2125	**11.4**
(Based on the GHE 2012 estimates of causes of death for 2011, the regional projections of mortality by cause for years 2015 and 2030 were carried out in 2012.[4]						

***Source: Reference (4)*

Injuries came at 6th in the list of common causes of death and are responsible for 11.3% of all deaths in SEAR (Table 1). Road injuries are the commonest cause of death in SEAR increasing from 24.7% to 28.9% from 2015 to 2030, respectively.[4] With 90% of deaths occurring in LMICs which only account for 54% of the world's vehicles, these deaths and injuries are unevenly distributed[5] Figure 2 illustrates country-specific road traffic fatality rates. Amongst people 15 to 29 years of age, road traffic injuries are the leading cause of death, and cost governments approximately 5% of GDP in LMICs. Other notable areas of injuries are falls (18.5%) and self-harm (19.4%) leading to deaths in SEAR (Table 2)[4].

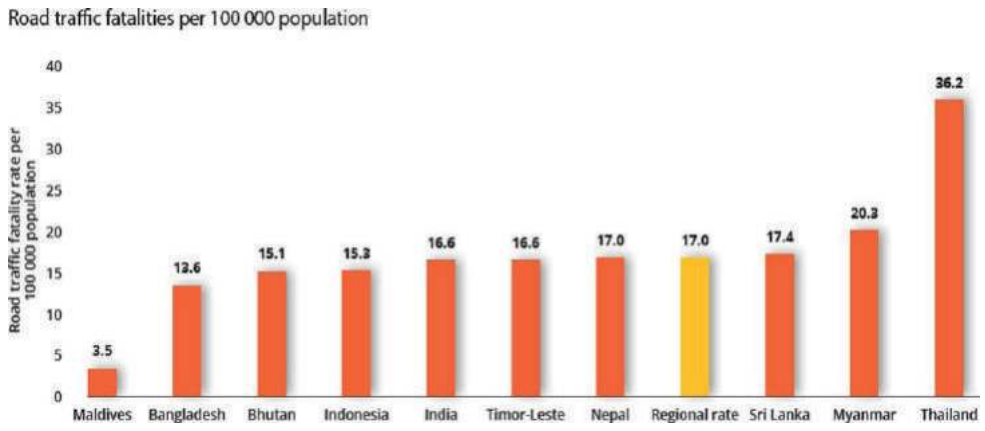


Figure 2: *Road traffic fatalities per 100,000 populations in SEAR[5]*

***Source: Reference (5)*

BURDEN IN INDIA

The top five individual causes of disease burden in India were Communicable, maternal, perinatal and nutritional conditions in 1990, whereas in 2016, three of the top five causes were Non-communicable diseases (NCDs), showing a shift toward NCDs (Table 2). From 1990 to 2016 the number of DALYs due to most NCDs increased. The increase in all-age DALYs rate between 1990 and 2016 was highest for diabetes (80·0% [95% UI 71·6–88·5]), ischaemic heart disease (33·9% [24·7–43·6]), and sense organ diseases (mainly vision and hearing loss disorders; 21·7% [20·1–23·3]). Of the individual NCDs that are in the top 30 leading causes of DALYs in 2016.[6]

Table 2: Table 2: Percentage contribution of disease categories to total deaths by age groups for all of India, 2016[6]

Year			2016
Population (thousands)			1324200
GHE 2012 cause category			Total (%)
	All Causes		**100**
I.	**Communicable, maternal, perinatal and nutritional conditions**		**27.5**
II.	**Non-communicable diseases**		**61.8**
	A.	Cardiovascular diseases	**28.1**
	B.	Respiratory diseases	**10.9**
	C.	Malignant neoplasms	**8.3**
	D.	Diabetes mellitus	**6.5**
III.	**Injuries**		**10.7**
Data are % (95% uncertainty interval).			

***Source: Reference (6)*

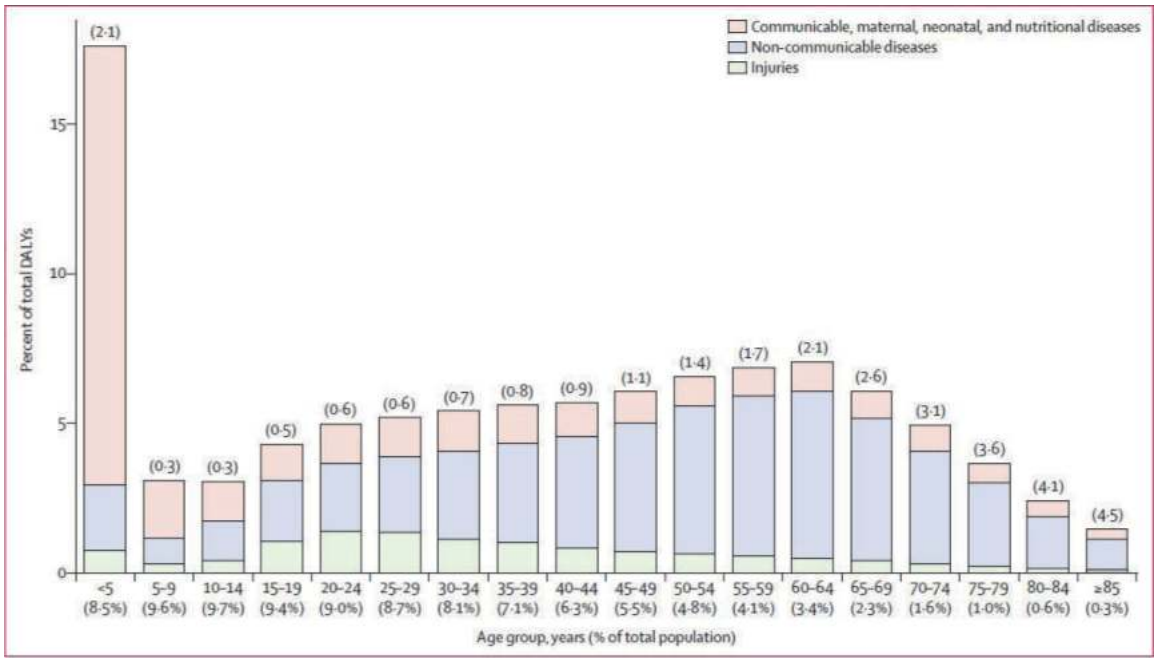


Figure 3: *Percent of total DALYs by age groups in India, 2016(6)*

***Source: Reference (6)*

The higher proportion of the total DALY burden relative to their proportion of the population was observed in the age groups of younger than 5 years and 45 years or older. The age group of younger than 5 years group constituted 8.5% of the population and had 17.6% of the DALYs. The highest proportion of DALYs were in children younger than 5 years (83·4%) attributed to Communicable, maternal, perinatal and nutritional conditions%), and the lowest was in the 50–54 years age group (14·7%).The proportion of DALYs due to Non-communicable diseases was highest at 78·8% in the 65–69 years group and exceeded 50% in the 30–34 years group (Figure 3).The proportion of total DALYs due to injuries was highest in the age groups from 15 years to 39 years(range 18·3–28·1%).[6]

CURRENT STATUS OF EMERGENCY CARE IN THE INDIA

Emergencies and accidents are common place in all parts of India. Though India is a developing country, due to rapid economic growth and urbanization, it faces the ills of both an under-developed as well as developed economy. Every day, India faces the dual challenges posed by emergencies related to infections and communicable diseases and those related to chronic diseases and trauma.

Pre-hospital care is being provided by the state government regulated ambulances in many states by Emergency Management and Research Institute with a common toll-free number 108. The command centre is however not situated or run by the government or the Emergency Departments. 108 do not provide any pre-hospital notification to the Emergency Departments.

Thus it is a rudimentary form of pre-hospital EMS that exists in India and needs modernization and integration with the hospitals at state and national level. India also lacks a universal toll free number and there are more than one numbers that lead to ambulance services for different emergency conditions.

With more than 150,000 road traffic related deaths, 98.5% 'ambulance runs' transporting dead bodies, 90% of ambulances without any equipment/oxygen, 95% of ambulances having untrained personnel, most ED doctors having no formal training in EMS, misuse of government ambulances and 30% mortality due to delay in emergency care, India portrays a mirror image of the U.S. of the 1960s.

EMS has changed since the time it was commonly stated that, "EMS systems in India are best described as fragmented."[7] India has two different yet overlapping publicly funded ambulance systems, with both popularly known by their helpline numbers, 108 and 102. Between them, they have more than 17,000 ambulances across the union of 31 states and union territories. The allocated federal fund for the ambulance services in 2013-2014 was $59 million.[8]

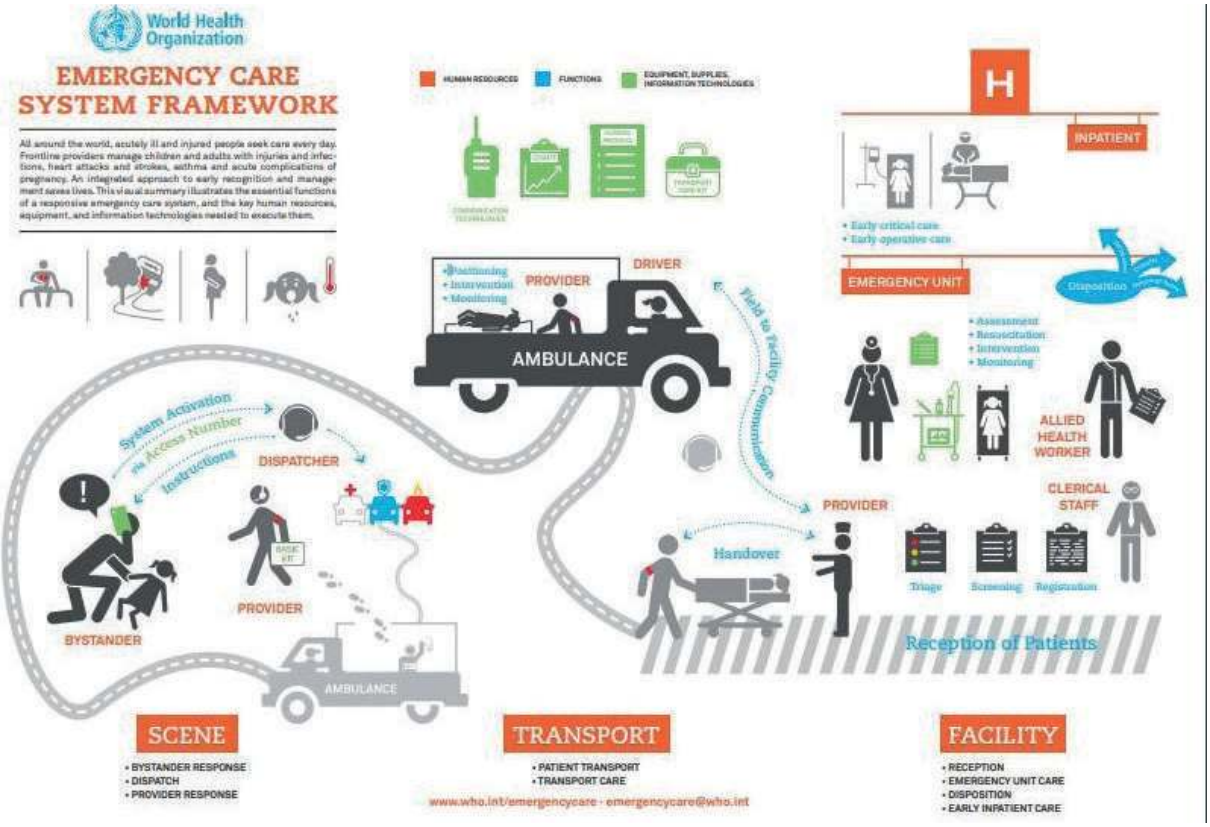
The provision of emergency services is enshrined in India's Constitution. As per the Article 21 of India's Constitution "right to life", if any hospital fails to provide timely medical treatment to a person result's in the violation of person's "right to life".[8] India always had a disproportionately small health budget because of its ambitious growth aspiration and fastest growing population, with one doctor for every 1,700 people and 21% of the world's burden of disease.[9] In India almost 23% of all trauma is transportation-related, with 13,74 accidents and 400 deaths every day on roads.[10] The rest of the 77.2% of trauma is related to other events such as falls, drowning, agriculture related, burns, etc.[11] According to World Health Organization, India has the highest snakebite mortality in the world estimates it at 30,000 every year.[12]

WHO EMERGENCY CARE SYSTEM FRAMEWORK

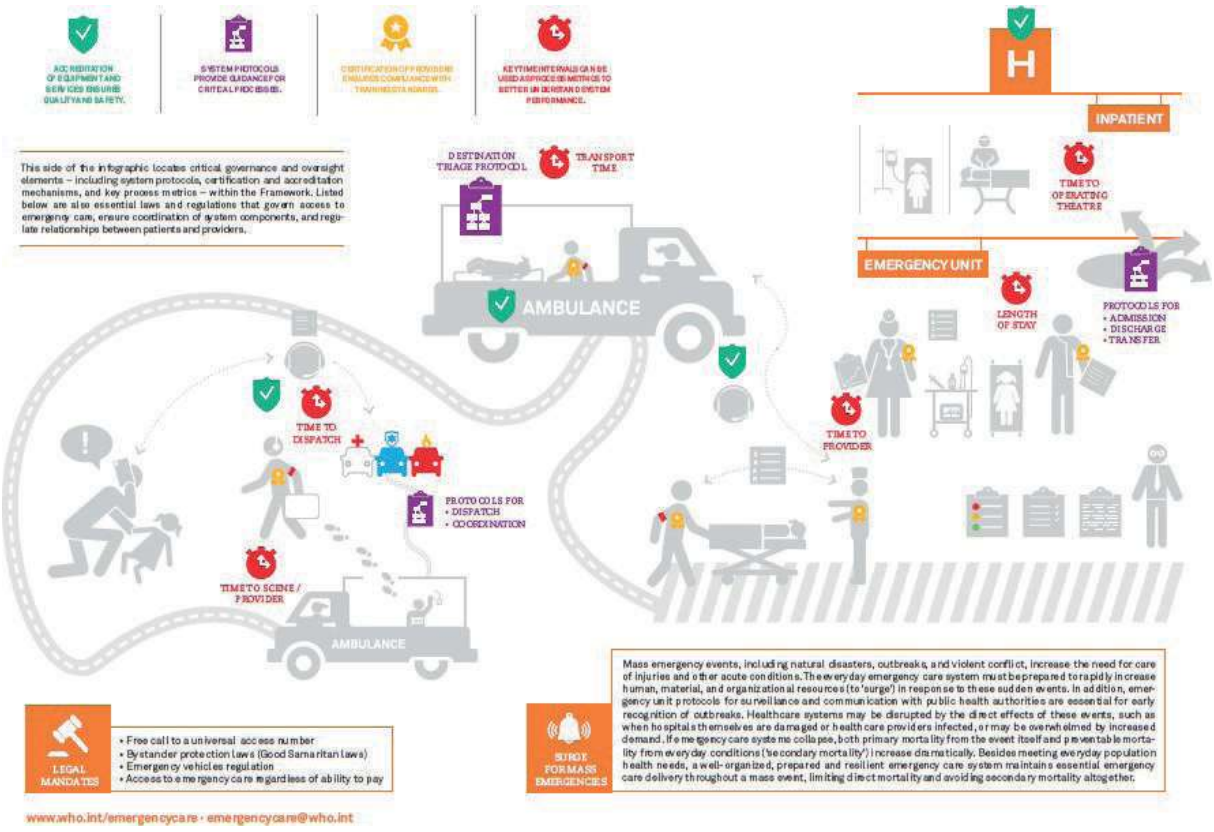
The WHO info graphics below (Figure 4 a & b) are visual representations of the WHO Emergency Care System Framework, designed to support policy-makers wishing to assess or strengthen national emergency care systems. It is the result of global consultations with policy-makers and emergency care providers across all regions, and provides a reference framework to characterize system capacity, set planning and funding priorities, and establishes monitoring and evaluation strategies.

Figure 4a illustrates the essential functions of an effective emergency care system, and the key human resources, equipment, and information technologies needed to execute them (organized by health systems building blocks).

Figure 4b info graphic complements this by locating critical governance and oversight elements—including system protocols, certification and accreditation mechanisms, and key process metrics—within the Framework. Also identified in the figure are essential overarching laws and regulations that govern access to emergency care, ensure coordination of system components, and regulate relationships between patients and providers.



(a)



(b)

Figure 4: *WHO Emergency Care System Framework*[13]

***Source: WHO info-graphics*

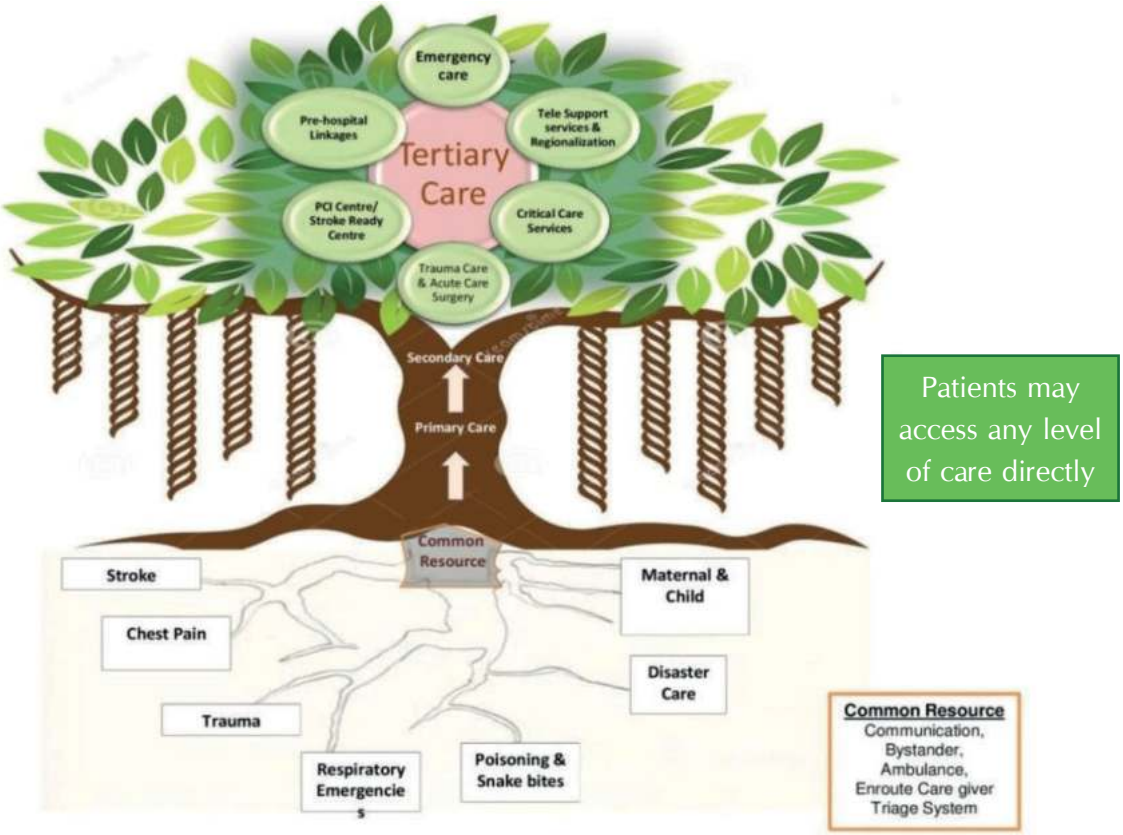


Figure 5: *Integrated Model: The roots feeding the Emergency Care System*

HOSPITAL BASED EMERGENCY CARE IN THE GOVERNMENT SECTOR IN INDIA

Definitive care for victims with emergencies is offered by government hospitals, corporate hospitals and a large number of small clinics. Government hospitals generally offer free care, but the quality of that care differs between centres. Most university hospitals provide a reasonable level of emergency care. District hospitals often lack trained staff, adequate infrastructure, and supply of consumables.[14] Triage is rarely practiced. As a result, impressive but non-life-threatening extremity trauma may take precedence over bacterial meningitis or myocardial infarction.

There are no dedicated trauma surgeons and very few designated trauma centres in India. Orthopedic surgeons lead the trauma response in 50% of facilities.[15] In the remainder; the responsibility is not clearly defined. In the absence of defined roles amongst specialists, clinical decisions are often delayed. Multi-system injury patients are at the greatest risk.

Typically, most of the "emergency care" in the hospitals in India is provided in areas known as Casualty or Accident rooms. Formal education and specialty training in emergency care are neither available nor mandatory for personnel involved in emergency care. These Causality/ Accident room physicians lack any specific training in emergency medicine.[14] Proceedings have only recently been initiated to recognize Emergency medicine as a distinct medical discipline. Residents posted in these 'rooms' often rotate from various specialties such as surgery, orthopedics, and medicine and have little commitment towards patient management. These physicians are often waiting to retake the All India Entrance Examination in the hope of securing postgraduate position in established fields recognized by the MCI.[16] In some hospitals, emergency rooms (ERs) are traditionally divided into separately run medical and surgical teams. With this division it becomes very difficult to deliver quality, cost-effective care. In many hospitals, physicians staffing the emergency rooms lack the resources and knowledge to manage the wide variety of emergencies. They therefore function as 'postal carriers' who 'deliver 'victims to the respective specialties. The most junior and inexperienced staff frequently treat the most seriously injured patients.

TRAINING

Husum et al. have demonstrated that laypeople trained in first aid can effectively respond to emergencies in a community within a high trauma burden[17,18]. In hospitals, most in-service training for emergency care professionals is designed to address particular problems, such as severe injuries, pediatric emergencies or obstetric emergencies. Yet because of the resource constraints of low-income countries, the same personnel will be confronted with all of these conditions. Unfortunately, few courses in emergency care have been rigorously evaluated [19, 20]. The Advanced Trauma Life Support course, a meticulously controlled training course in clinical skills for doctors that was devised by the American College of Surgeons, has improved patients' outcomes in some settings, although it may be too expensive for most low- and middle-income countries, and it is clearly inappropriate for settings where most patients are not seen by doctors. In a tertiary hospital in Trinidad and Tobago, mortality from injury fell by 50% after doctors attended this course[21].Training in life-saving obstetric skills was found to contribute towards reducing maternal deaths in Kebbistate, Nigeria, and in other sites where the intervention was implemented[22,23].

Emergency Triage Assessment and Treatment (ETAT) training, part of WHO's Integrated Management of Childhood Illnesses strategy, has been used in many countries to improve pediatric emergency care[24]. Other examples of training courses are Primary Trauma Care[25], devised by the World Federation of Societies of Anaesthesiologists, and Advanced Life Support in Obstetrics, devised by the American Academy of Family Physicians [26].The above courses are used to standardize protocol-based emergency care but evaluations of their outcomes are still awaited. The National Trauma Management Course in India[27] costs US $50.00 per trainee and is taught by local trainers. This course has now become a national training standard for immediate trauma care in India. The courses described above are all examples used to show that even in the absence of ambulances it is possible to improve emergency medical systems. Low-income countries need to identify training models that are appropriate for their emergency care personnel, who may need to take on a variety of roles, especially those working at middle-level facilities, who respond to different types of emergencies.

ACADEMIC EMERGENCY MEDICINE

Academic emergency medicine is a recognized post-graduate program since 2009. Presently, more than 28 medical colleges are offering a total of 60 seats, a diplomat of national board (DNB) offering more than 120 residency seats in Emergency Medicine in a year. This number is highly inadequate and not enough to cater the needs of even one state of India. Indo-US collaborative INDUSEM played a major role in shaping the academic emergency medicine in India and now in SEAR and rest of the world too.

Emergency Medicine (EM) is a new academic discipline in its infancy in India. Dedicated emergency medicine faculty will be the keys for developing a national skilled emergency care workforce. A strategy for integrated, coordinated trauma care and injury prevention activities must be developed in India. Gujarat has become the first state to pass legislation addressing emergency medical services.

Emergency Medicine (EM) Departments are the front line for the community during a disaster. A disaster is defined as that time, when the need for staff, supplies and space exceed resources due to an extraordinary stress on a community, e.g. earthquake, biological outbreak or terrorist attack. As a result, Disaster Medicine has been, and continues to be, an important focus for Emergency Medicine. The Emergency Department (ED) is the place to train, set standards for response, and create a culture of preparedness not only for the Hospital but the community as well. As the Emergency Department heads the Hospital's Committee on Disaster Preparedness by establishing protocols, conducting training, and facilitating exercises, they also create the opportunity for a good relationship between the hospital administration and the community. This proactive involvement validates the EM program and creates added value for those involved: physicians, residents, and students, thus improving better patient care.[28]

GAPS

Research and Development for Emergency Services

As a neglected topic, emergency medical systems are part of the 10/90 gap in health research whereby less than 10% of global research investment is spent on problems affecting 90% of the

world's population[29]. A review of the evidence on emergency medical systems as applicable to low- and middle- income countries reveals many gaps in global knowledge. There is a need to better understand the epidemiology of conditions that may be addressed by emergency systems in these countries and to better understand which interventions may address them adequately. Intervention trials in low- and middle-income countries are research priority in the field of emergency medical systems. Well-designed, locally appropriate studies that establish effectiveness are urgently needed, and they should include both those interventions that may be available in high-income countries and newer interventions. Economic analysis is another area where research is needed, especially in places where cost and cost–effectiveness information from low- and middle-income countries is scant[30]. These gaps reflect the need for a more systematic analysis of the areas towards which research investments should be directed in order that systems can be based on credible evidence.

Organization and financing

An emergency medical system must be sensitive to and meet the needs of the poor. Issues of access to the system become critical because a lack of money often deters people from using emergency services. Different means of achieving this financial protection need to be explored, including community financing[31,32]. As a result, emergencies often lead to financial ruin for poor families, and the implementation of some sort of financial protection for emergency health care has not received adequate attention. Such protection would ensure that those with limited finances are not deterred from using emergency services and that they do not get tipped into extreme poverty by having to meet costs entirely out of their own pocket Community loan funds to cover transportation and other requirements for emergencies, especially for obstetrics, have been used in various setting, especially in Africa.[33,34]

AIMS AND OBJECTIVES 04

04

AIMS AND OBJECTIVES

Primary Objective:

1. To access current status of facility based Emergency and Injury care in district hospitals

Secondary Objective:

1. Burden of emergency conditions including injuries
2. Assess the current status of Emergency and Injury care system linkages
    a. Pre-hospital care (including intra-specific referral to ambulance services)
    b. Hospital Care (Definitive care)

METHODOLOGY 05

05

METHODOLOGY

The study was initially proposed and approved for the assessment of 50 tertiary care centres (government medical colleges and large private hospitals) and 50 secondary care centres (district hospitals) of India.

In consultation with NITI Aayog, it was decided that the health facilities to be assessed be categorized in 5 categories for the study purpose: Medical College more than 500-bed strength (20), Government hospitals more than 300-bed strength (20), Government hospitals less than 300-bed strength (20), Private hospitals more than 300-bed strength (20) and Private hospitals less than 300-bed strength (20).

A total of 34 district hospitals (15 district hospitals >300 beds and 19 district hospitals <300 beds) selected from all over the country.

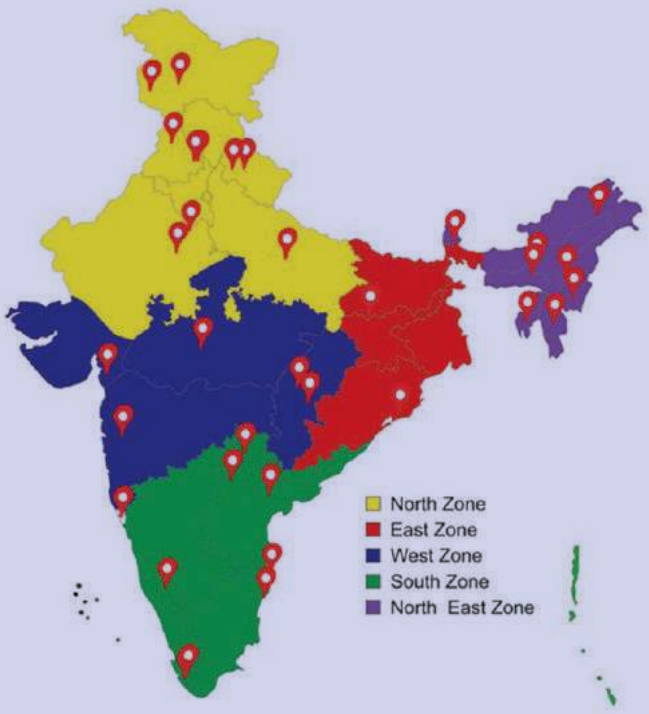


Figure 6: *Map showing district hospitals (tagged red) selected for this study from different states and different zones*

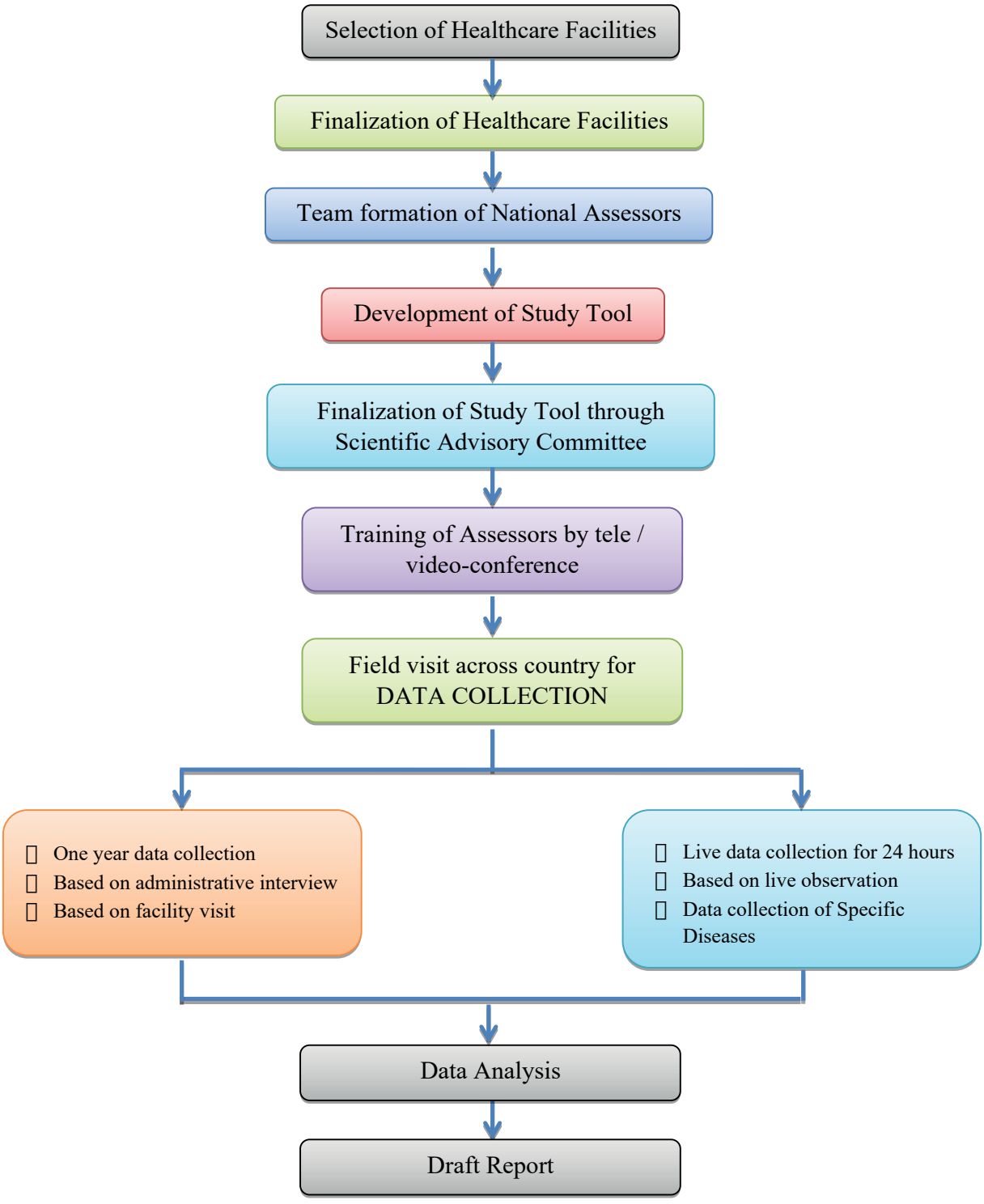


Figure 7: *(a) Flow chart of Methodology*

The study was carried out in five regions of India (North, South, East, West, and North-East) including 29 States and 2 Union Territories, from which 34 district hospitals (figure 6) were randomly selected from each zone. This cross-section study was undertaken in two phases:

1. Scientific Advisory Committee meeting for the finalization of the tool by the experts of various health departments
2. Quantitative and qualitative data collection as a pilot testing from two hospitals

Pilot testing was followed by collecting of data from the 34 randomly selected district hospitals(list is attached in Annexure-1) by a team of 3 assessors. The assessment was based on the administrative interview, facility visit and live observation of the healthcare facility.

1. **Identification of potential healthcare facilities:** While selecting the institutions for assessment, we had discussed with the experts' group. After a series of meetings and discussions with the experts' team, it was decided that there should be no overlapping of healthcare facilities.

   We have identified 34 healthcare facilities from five regions of the country and contacted the state health dignitaries to nominate a suitable nodal person for obtaining information about the healthcare facilities to assess suitability. These healthcare facilities were visited by the assessors' team for assessment.

2. **Finalization of the sites:** We have started the formal process of site selection from 20th May 2019. The process of selection took 2 weeks and by 3rd June 2019, the sites were finalized.

3. **Development of study tools, standard operating procedures:**

   - Study tools: The study tool was developed and finalized after SAC meeting and beta testing. The beta testing was done in two healthcare facilities (AIIMS, New Delhi and SSG Hospital, Gujarat) before the assessment being conducted at the proposed healthcare facilities. The study tool was divided into three major categories: lead assessor tool, live observation tool, and emergency burden tool. These categories were further subdivided into sections: background information of hospital, hospital services, ED protocol/SOP and guidelines, safety and security, disaster management, quality improvement, data management system, financing, physical infrastructure, manpower, equipments and supplies, point of care lab in ED and hospital, and essential medicines.
   - Standard operating procedures /manual: The study operational manual for data collection was developed and as a guide.

4. **Establishment of governance structure and a project implementation:** Scientific Advisory Committee (SAC) members were identified, which included 22 national experts from emergency and trauma, public health, research, and epidemiology. They provided technical guidance in study tool development, protocol development, and quality assurance.

5. **Training of assessors:** A tele/video-conference was organized every week to train the assessors. Based on the received data from sites, the assessors were trained subsequently for the challenges and the problems/issues faced by the other assessors' team during the assessment.

6. **Data Collection**: Healthcare facilities data were collected by a team of assessors (one lead assessor and two co-assessors) at each site visit.

   a. **One Lead assessor (*overall in-charge*)** was responsible for the conduct of survey and major observations/assessment mainly through local administrator interview, data source (hospital records) and site/facility visit, etc. He/she acted as a nodal person for communication with the central project team at JPNATC, AIIMS, New Delhi.

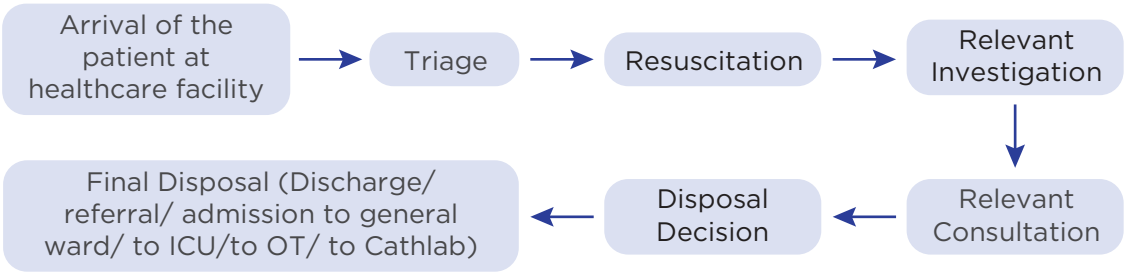
   b. Two other **Co-Assessors** were responsible for emergency department data collection by live observation (mainly assessing the emergency department processes & infrastructure, manpower, equipment, supplies, etc).

These assessors were trained for this study and were not blinded regarding the purpose of the study. The assessors were trained with the study tool and assessors training manual for the assessment of healthcare facilities. Data for the assessment of healthcare facilities were obtained from face-to-face interviews with key staff at each facility.

The presence of supplies including medications and equipment was assessed through direct observations. Assessors also checked the inventory of supplies in facilities which allowed them to do so.

7. **Definition and process of Live Data Recording:** The assessment done by two Co-assessors (figure 7) included continuous observation for 24 hours in healthcare facility without any direct contact with patients admitted in the same premises. The live data recording done by the Co-assessors was observation of the treatment process and procedures of patients especially having three conditions: chest pain, stroke and trauma.

   The process involved for live data collection (as per the data collection tool) was as follows:



8. **Data analysis:** Data collected from the health-facilities was entered using a Microsoft Excel-based database. The analysis was done by using SPSS (Statistical Package for the Social Sciences). The level of analysis for the assessment is the facility, and for overall analysis it is category of the hospital.

   Frequencies were computed for different sections of the study tool such as emergency equipment, essential medicines and written protocols for the management whereas median with IQR and minimum, maximum were computed to present the distribution of continuous variables, for example, doctors per facility.

   We had calculated the percentages of all essential equipment and medicines. We assessed availability of equipments and essential medicines on three different scales: 50% or less (Score-0), 50% to 99% (Score-1), and 100% (Score-2).

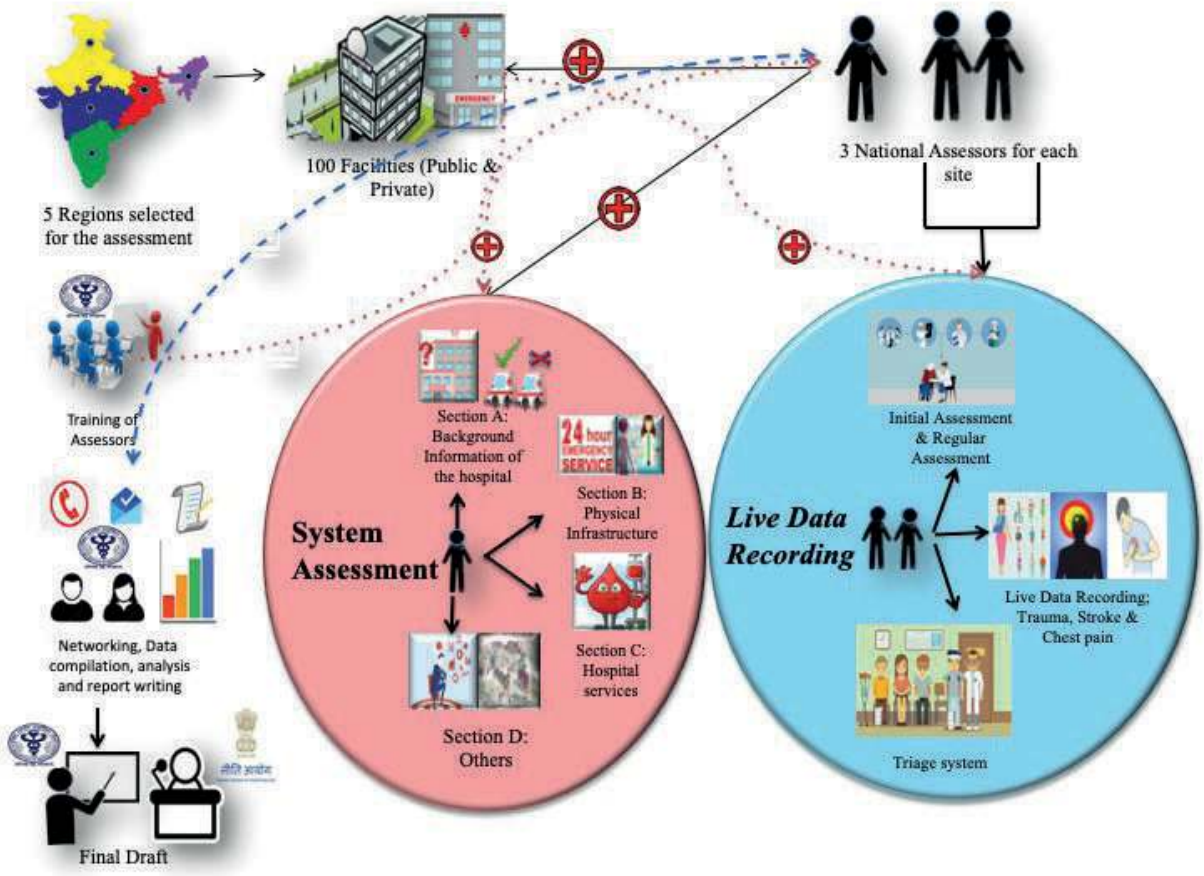


***Figure 7b**: Overall representation of strategy and procedures of Data Collection*

OBSERVATIONS AND RESULTS WITH SUGGESTIONS

06

06

OBSERVATIONS AND RESULTS WITH SUGGESTIONS

I. FIELD VISIT: ADMINISTRATIVE INTERVIEW/ONE YEAR DATA COLLECTION

We are presenting the observations based on the findings from both qualitative and quantitative components of the assessment research.

1. BACKGROUND INFORMATION OF THE HOSPITALS

Out of 34 district hospitals studied, 19 hospitals were district hospitals less than 300 beds and 15 hospitals were district hospitals more than 300 beds.

2. AVAILABLE BEDS AT ASSESSED FACILITIES

The data of hospital bed strength was collected from each hospital such as hospital in-patient beds and emergency beds separately. Out of 34 hospitals, only 2-3 district hospitals had triage beds and follows triage policy.

The median [IQR] min-max of in-patient beds and emergency beds (the beds assigned for emergency) for district hospitals is shown in table 3.

Table 3: Summary of available Beds in Hospitals: Emergency Department Beds and Inpatient Beds

District Hospitals	n	Emergency beds in Hospital	Total Inpatient beds in Hospital	% of Emergency Beds out of all Beds at ED
		Median [IQR] Min-Max	Median [IQR] Min-Max	
More than 300 Beds	15	14 [13] 2-183	400 [205] 200-626	**3%**
Less than 300 Beds	19	6 [7] 1-22	120 [176] 47-380	**5%**

**n: number of hospitals which shared data with assessor's team, IQR: Interquartile range*

The maximum number of emergency beds was observed at Indira Gandhi Government General Hospital, Puducherry (183 beds out of 626 in-patient beds).

The majority of hospitals did not have system for triage in their emergency department. Only one hospital *(Government Hospital, Tenali)* had triage system out of all 34 hospitals; two hospitals (*District Hospital, Neyyattinkara* and *District Hospital, Peroorkada*) follow triage partially, they have red and yellow beds but did not have green beds.

3. BURDEN OF PATIENTS (OPD AND EMERGENCY)

The annual census of the year 2018 (from 1st January 2018 to 31st December 2018) was collected from all the hospitals which includes number of patients visited in OPD and in emergency, number of medico-legal cases attended in emergency, number of admissions through emergency, etc.

In table 4, summary of patients visited in OPD and emergency at hospitals is reported with median [IQR] and min-max (figure 8). The annual burden on patients visited in emergency of district hospitals was calculated by dividing the total number of patients visiting in emergency with the total number of patients visiting in the hospital (OPD + Emergency) and the median value of percentage is reported in table.

Table 4: Summary of Patients visited in Emergency and OPD of Assessed District Hospitals (1st Jan 2018 to 31st Dec 2018)

District Hospitals	Emergency and Injury care Patients		OPD Patients		% of ED Patients out of all patients visited in hospital
	n	Median [IQR] Min-Max	n	Median [IQR] Min-Max	
More than 300 Beds	15	43001 [145229] 4876-308883	15	408743 [585148] 22000-1463635	**16%**
Less than 300 Beds	16	18738 [35502] 1560-227364	19	180000 [159664] 44400-743278	**16%**

**n: number of hospitals which shared data with assessor's team, IQR: Interquartile range*

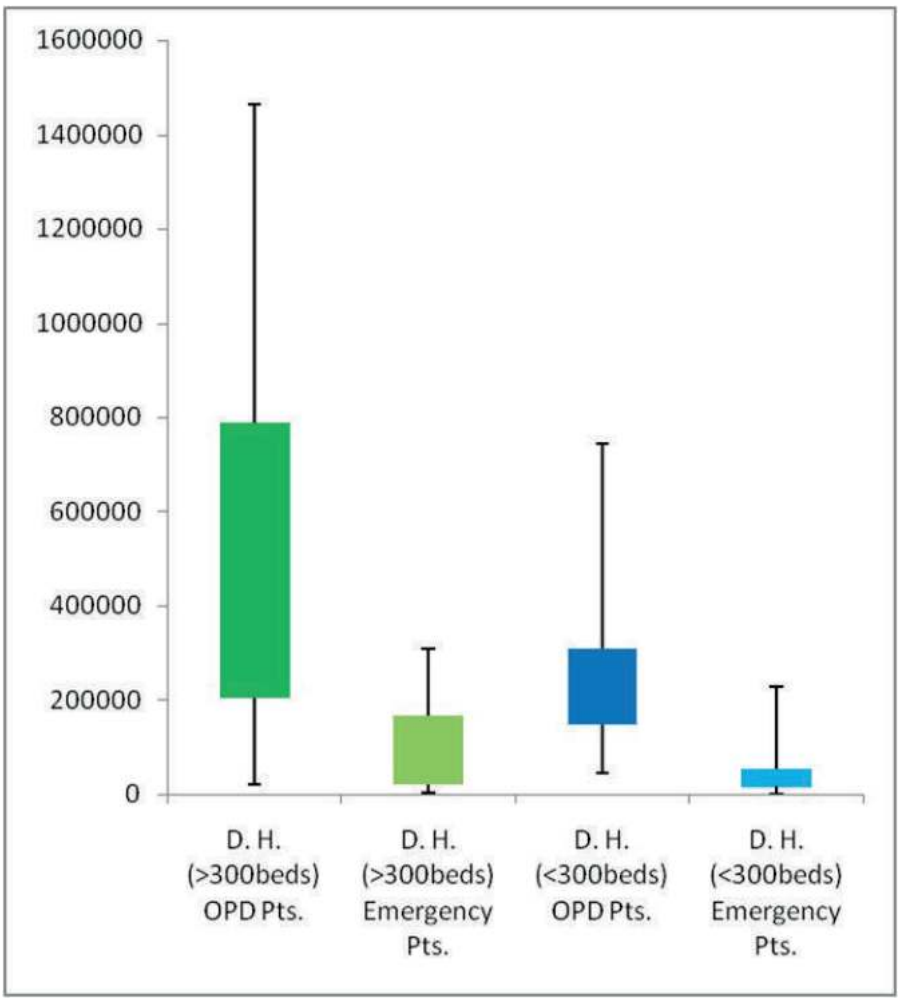


Figure 8: *Comparison of Patients visited in OPD and Emergency at District Hospitals (1st Jan 2018 to 31st Dec 2018)*

**D.H.: District Hospitals, OPD: Out-patient Department, Pts.: Patients*

The annual burden of patients who presented as emergency case, out of all patients visited in hospital for the year 2018 were 16% in both categories of district hospitals.

In district hospitals >300 beds, the burden of patients in emergency as well as in OPD was maximum at Indira Gandhi Government General Hospital, Puducherry and minimum at District Hospital, Dhamtari.

In district hospitals <300 beds, the burden of patients in emergency was maximum at Puri District Headquarter Hospital and minimum at Sadar Hospital, Gaya.

Data maintained regarding adult/pediatric patients were heterogenous across the studied hospitals. Only 15 hospitals maintained OPD data of adult patients and 13 hospitals maintained data of pediatric patients. Similarly, 14 hospitals maintained ED data of adult patients and 12 hospitals maintained data of pediatric patients respectively.

In table 5, separate adult and pediatric patient's data for OPD and emergency is reported with median [IQR] and min-max.

Table 5: Summary of Patients visited in OPD and Emergency (Adult and Pediatric) at District Hospitals (1st Jan 2018 to 31st Dec 2018)

District Hospitals	Emergency and Injury care Patients				OPD Patients			
	Adult		Pediatric		Adult		Pediatric	
	n	Median [IQR] Min-Max	n	Median [IQR] Min-Max	n	Median [IQR] Min-Max	n	Median [IQR] Min-Max
More than 300 Beds	8	26181 [125102] 10000-281011	7	3880 [25875] 1986-30204	8	330166 [358392] 21000-1388295	7	46812 [57392] 1000-127688
Less than 300 Beds	6	18021 [91844] 1440-150007	5	687 [11192] 311-22688	7	197871 [275943] 110132-586632	6	23035 [41304] 1479-96725

**n: number of hospitals which shared data with assessor's team, IQR: Interquartile range*

In addition, the definition for pediatric age group also varied among the assessed hospitals. Out of 34 hospitals, 13 hospitals were following 0-12 years age for pediatric patients, 8 hospitals were following 0-14 years age, 3 hospitals were following 0-15 years age, 2 were following 0-18 years age, and 8 hospitals did not have the details for the same.

4. HUGE MISMATCH BETWEEN EMERGENCY BEDS & BURDEN OF EMERGENCY AND INJURY CASES:

Table 6 depicts the gap between the emergency beds and burden of patients in emergency, it is clear that there is a huge mismatch between emergency beds and burden of emergency cases.

Table 6: Huge Mismatch between Emergency Beds & Burden of Emergency and Injury Cases

District Hospital	% of Emergency and injury cases (One Year)	% of Emergency and injury cases (One Day)	% of Available Emergency Beds
More than 300 beds	16%	12%	3%
Less than 300 beds	16%	10%	5%

Mostly district hospitals have only 3-5% available emergency beds while the yearly burden of patients was 16%, which is much more than the available beds. It may be because mostly district hospitals are present in rural areas and semi-urban areas which cater to rural population (65.9% of population is rural according to the World Bank collection of development indicators in 2018). By the above observation, it is clear that the optimum utilization of resources is missing in district hospitals.

For providing optimal care/services in district hospitals, we need to increase the number of emergency beds to**12% of all beds with addition of 10% as buffer beds based on footfall.**

Secondly, needs to be developed cashless for emergency care and thirdly, to provide quality of care as per the existing and expected footfall we need to strengthen district hospitals by-

1. Upgrading them to medical college
2. Developing residency programme in DNB: where in PG residents rotate regularly at district hospitals
3. Initiate programme based in centivization of government hospitals

DNB (Diplomate of National Board) Emergency Medicine Criteria: The hospital should be 200 bedded with 50 patients per day in emergency (Assumption- By developing residency programme, the footfall of patients will increase).

**Note: Emergency Beds: The beds assigned for emergency department.*

Buffer Beds: The beds under department of emergency for addressing surge capacity including ICU facility and it should have separate beds for disaster.

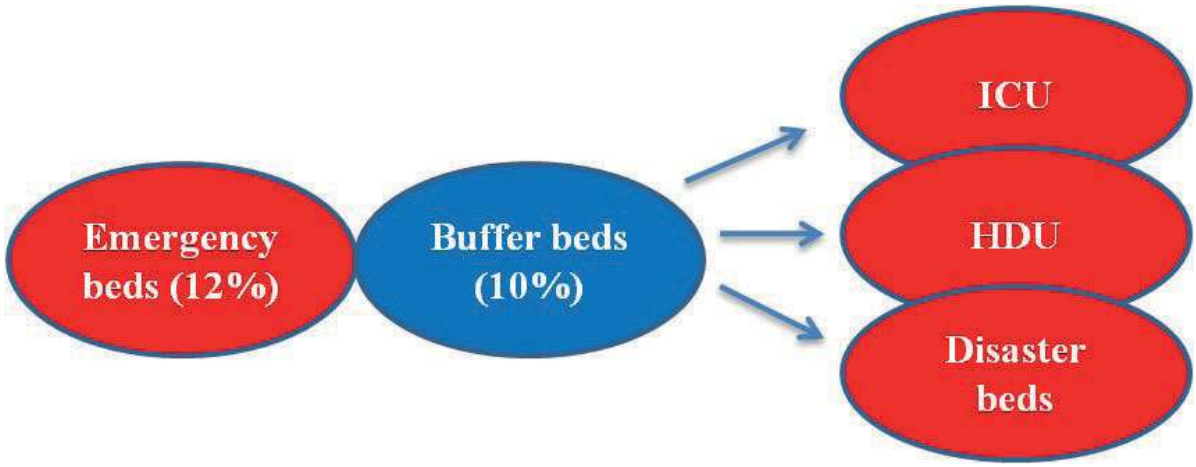


Figure 9: *Beds allocation for Emergency Department*

5. BURDEN OF MEDICO-LEGAL CASES:

Table 7 summarizes the annual number of medico-legal cases attended in emergency at district hospitals >300 beds and <300 beds with median [IQR] and min-max.

Table 7: Summary of Medico-legal cases attended in Emergency of District Hospitals

District Hospitals	Medico-legal Cases		% of MLC = Total MLC / Total Emergency Pts.
	n	Median [IQR] Min-Max	
More than 300 Beds	15	2679 [4858] 150-23728	**3.1%**
Less than 300 Beds	14	1355 [1575] 410-10049	**6.4%**

**n: total number of hospitals which shared data with assessor's team, IQR: Interquartile range, MLC: Medico-legal cases*

The annual burden of medico-legal cases attended at hospitals emergency was calculated by dividing the total number of medico-legal cases attended at emergency with the total number of patients visiting in the emergency and the median value of percentage is depicted.

In district hospital >300 beds, maximum medico-legal cases in emergency were at District Hospital, Karim Nagar, Telangana and minimum at Deen Dayal Upadhyay Hospital, Himachal Pradesh.

In district hospital <300 beds, maximum medico-legal cases in emergency were at North Goa District Hospital and minimum at Morigaon Civil Hospital, Assam.

Majority of district hospitals <300 beds make more MLC's than district hospitals >300 beds. It may be because they have dedicated CMO (Chief Medical Officer), who makes MLC cases. Preparation of MLC reports adds to the existing mandate of providing quality acute care service by the emergency care provider.

Suggestions to improve MLC related services; the following are suggested:

1. Develop dedicated EMO (Emergency Medical Officer) / Senior Resident (Forensic Medicine) to deal with MLC documentation and representation to court
2. Station an in-house police post for mitigating plausible violence and protection of emergency care provider. This would aid in better co-ordination of MLC documentation and legal service

6. BURDEN OF ADMISSIONS THROUGH EMERGENCY

Table 8 summarizes the annual number of admissions through emergency at district hospitals >300 beds and <300 beds.

The annual burden of admissions through hospital emergency was calculated by dividing the total number of admissions through emergency with the total number of patients visiting in emergency.

Table 8: Summary of Admissions through Emergency at District Hospitals

District Hospitals	Admissions through Emergency		% of patients admitted of those visiting ED
	n	Median [IQR] Min-Max	
More than 300 Beds	12	5863 [16658] 373-55293	**18.7%**
Less than 300 Beds	12	196 [11988] 147-227364	**35.7%**

**n: total number of hospitals which shared data with assessor's team, IQR: Interquartile range, ED: Emergency Department*

In district hospital >300 beds, maximum admissions through emergency was at District Hospital, Karim Nagar, Telangana and minimum at Deen Dayal Upadhyay Hospital, Himachal Pradesh.

In district hospital <300 beds, maximum admissions through emergency was at Puri District Headquarter Hospital, Orissa and minimum at Morigaon Civil Hospital, Assam.

Suggestions:

The number of admissions through emergency was high in district hospitals but they have less number of emergency beds to cater the footfall.

1. Upgrade them to medical college
2. Develop residency programme for emergency medicine

7. BURDEN OF DEATH OF TRAUMA PATIENTS:

Table 9 depicts the annual number of death of trauma patients in emergency of district hospitals >300 beds and <300 beds. It was compared with the total number of trauma patients (one day) visited in emergency of both district hospitals.

Table 9: Summary of Death of Trauma Cases in Emergency of District Hospitals

District Hospitals	Death of Trauma Patients (ONE YEAR)		Number of Trauma Patients in Emergency (ONE DAY)		
	n	Median [IQR] Min-Max	Total Pts in one day	n	Median [IQR] Min-Max
More than 300 Beds	6	12 [7] 6-16	123	13	5 [7] 6-16
Less than 300 Beds	7	22 [23] 1-27	124	17	5 [6] 1-40

**n: total number of hospitals which shared data with assessor's team, IQR: Interquartile range*

Death of trauma patients was high in district hospitals <300 beds when compared to district hospitals >300 beds. It may be assumed that the death of trauma patients was due to delay in definitive care (**beyond Golden Hour)** and due to lack of trained human resources in emergency.

Suggestion:

Develop a robust integrated emergency care system which includes injuries

8. BURDEN OF PATIENT'S DEATH DUE TO ROAD TRAFFIC INJURY

Table 10 depicts the annual number of patient's death due to road traffic injury in emergency of district hospitals >300 beds and <300 beds.

Table 10: Summary of Patient's Death due to Road Traffic Injury in Emergency of District Hospitals

District Hospitals	Patient's Death due to Road Traffic Injury	
	n	Median [IQR] Min-Max
More than 300 Beds	8	**17 [98] 1-1042**
Less than 300 Beds	2	**24 [13] 24-37**

**n: total number of hospitals which shared data with assessor's team, IQR: Interquartile range*

It may be assumed that the patients of road traffic injury died due to lack of pre-hospital care, lack of injury prevention and may be they are non-salvageable.

9. BURDEN OF BROUGHT DEAD PATIENTS:

Table 11 summarizes the annual number of brought dead patients in emergency of district hospitals >300 beds and <300 beds with median [IQR] and min-max.

Table 11: Summary of Brought Dead Patients in Emergency of District Hospitals

District Hospitals	Brought Dead Patients	
	n	Median [IQR] Min-Max
More than 300 Beds	8	133 [202] 23-708
Less than 300 Beds	7	24 [58] 3-159

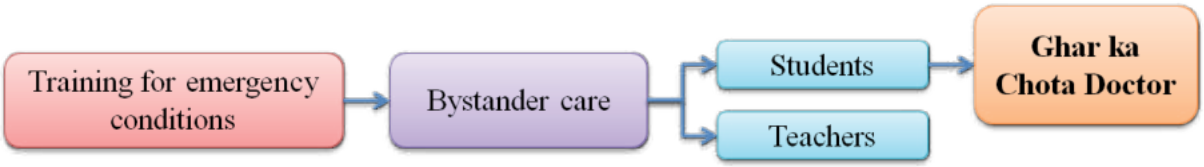
**n: total number of hospitals which shared data with assessor's team, IQR: Interquartile range*

It may be assumed that brought dead patients came to hospitals due to:

1. Failure to recognize, resuscitate and refer of sick patients either by bystander or paramedic
2. Probable non-salvageable patients

Suggestions:

1. Develop preventive emergency healthcare strategy such as **National Injury Prevention Programme**
2. Developing a **robust emergency injury care initiative**



3. There should be **installation of public access device of AED** (Automated external Defibrillator) as a national policy in mass gathering areas such as schools, shopping mall, railway station, etc.
4. Implement good Samaritan law for all emergency conditions including injuries across the country

10. BLOOD BANK SERVICES:

Table 12 summarizes the hospital blood bank services for all district hospitals. As per the assessment, all district hospitals had blood bank facility (either in-house or tie-up with other facility) except 5 district hospitals (<300 beds). They neither had licensed in-house

blood bank nor have any tie-up with other blood bank–*District Hospital, Ganderbal; District Hospital, Bishnupur; Civil Hospital, Sec-22, Chandigarh; Sadar Hospital, Gaya and Coronation Hospital, Dehradun*. In 15 district hospitals, the blood bank is not available for 24*7.

Table 12: Summary of Hospital Blood Bank Services in District Hospitals

Hospital Blood Bank Services	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Full Compliance	Partial Compliance	Non Compliance	Full Compliance	Partial Compliance	Non Compliance
Licensed in-house Blood Bank	10	2	3	7	4	8
24*7 Blood Bank	11	2	2	8	1	5
Tie up with external blood bank	5	3	1	6	2	4
Separate Component Facilities	3	5	6	6	1	8
O-ve Blood Availability	9	3	3	7	5	4
ED Blood Storage	1	2	12	5	2	9
ED Blood Transfusion Protocol	1	1	12	3	1	13
Massive Blood Transfusion Protocol	1	1	12	4	0	13

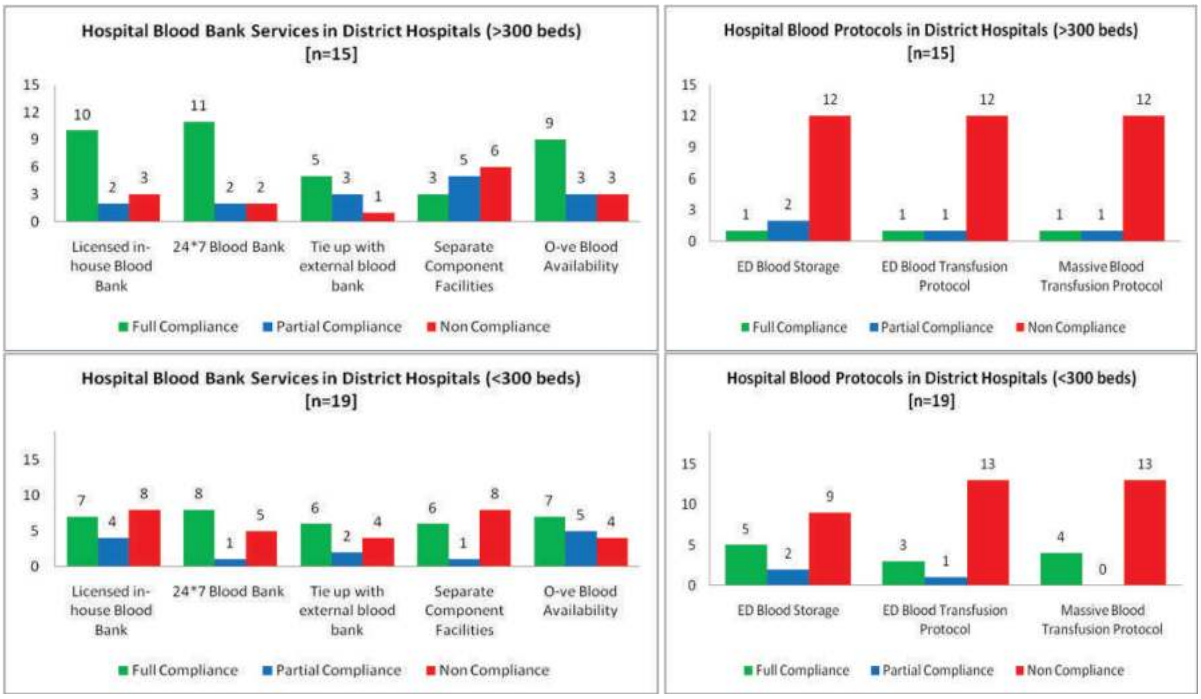


Figure 10: *Hospital Blood Bank Services in District Hospitals*

It was observed that 9 district hospitals had separate component facility for packed cell (RBC), FFP, Platelet Cryoprecipitate, 16 district hospitals had availability of O-ve (Negative) blood in their hospitals as shown in figure 9.

Only 4 district hospitals had emergency blood transfusion protocol and only 5 had massive blood transfusion protocol out of 34 assessed district hospitals.

Best Practices for Blood Bank Services

- For 300-500 bedded government hospital- District Hospital Baramulla, Jammu & Kashmir had 24x7 blood bank availability and also had separate ED blood storage with separate component facility.
- For 100-300 bedded private hospital- North Goa District Hospital had 24x7 blood bank availability and also had separate ED blood storage with separate component facility.

6 district hospitals had separate blood storage for ED:

- District Hospital, Baramulla, J &K
- District Hospital, Virajpet, Karnataka
- Singtam District Hospital, Sikkim
- District Hospital, King koti, Telangana
- BDM District Hospital, Kotputli, Rajasthan
- North Goa District Hospital, Goa

District Hospital, Baramulla
ED Blood Storage

Suggestions:

For running acute care services, we need blood bank services for 24*7 in all district hospitals. Emergency blood storage is mandatory for those district hospitals (>300 beds) which deals with more trauma cases.

11. DEFINITIVE CARE SERVICES:

Definitive care is the care that is rendered conclusively to manage patient's condition, encompassing the full range of preventive, curative acute, convalescent, restorative, and rehabilitative medical care.

In this study the following categories were assessed: emergency operative services, intensive care unit services and specialized care services.

i) Emergency Operative Services:

In district hospitals (>300 beds), it was observed that 33% hospitals had emergency operative services for trauma patients, 53% hospitals had emergency operative services for non-trauma patients, 47% hospitals had emergency operative services for obstetrics patients, 40% hospitals had emergency operative services for orthopedic patients, and only 13% hospitals had emergency operative services for neurosurgical patients (table 13 and figure 11).

Table 13: Summary of Emergency Operative Services in District Hospitals

Emergency Operative Services	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Yes	Partial	No	Yes	Partial	No
For Trauma patients	5	7	3	1	7	11
For Non Trauma patients	8	5	2	2	7	10
For Obstetrics patients	7	5	3	7	9	3
For Orthopedics patients	6	4	4	4	6	8
For Neurosurgical patients	2	2	9	0	2	16

**n: total number of hospitals*

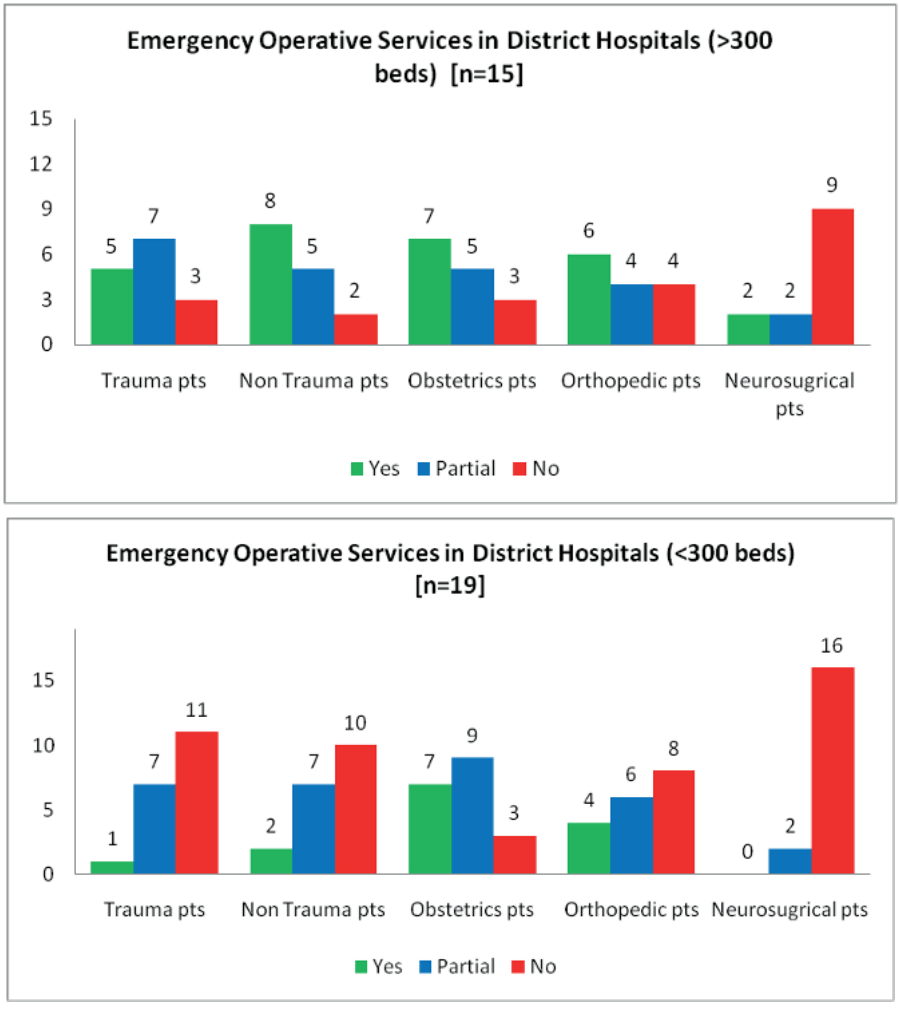


Figure 11: *Representation of Emergency Operative Services in District Hospitals*

In district hospitals (<300 beds), it was observed that only 5% hospital had emergency operative services for trauma patients, 10% hospitals had emergency operative services for non-trauma patients, 37% hospitals had emergency operative services for obstetrics patients, 20% hospitals had emergency operative services for orthopedic patients, and none of the hospitals had emergency operative services for neurosurgical patients.

ii) Critical Care Services

An intensive care unit (ICU), also known as an intensive therapy unit or intensive treatment unit (ITU) or critical care unit (CCU), is a special department of a hospital or health care facility that provides intensive treatment medicine.

In district hospitals (>300 beds), it was observed that 47% district hospitals had common ICU, 27% district hospitals had common HDU (High Dependency Unit), only 7% district hospital had pediatric ICU (PICU), 20% district hospital have neonatal ICU (NICU), 20% district hospital have neuro-ICU and 20% district hospital have cardiac ICU as shown in table 14 and figure 12.

Table 14: Summary of Critical Care Services at District Hospitals

Critical Care Services	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Yes	Partial	No	Yes	Partial	No
Common ICU	7	3	4	1	4	14
Common HDU	4	2	8	0	1	18
Pediatric ICU	1	4	9	0	2	17
Neonatal ICU	3	4	7	4	4	11
Neuro ICU	3	0	10	0	0	18
Cardiac ICU	3	1	9	0	0	18

**n: total number of hospitals, ICU: Intensive Care Unit, HDU: High Dependency Unit*

In district hospitals (<300 beds), it was observed that only 5% district hospital had common ICU, none of the district hospital had common HDU (High Dependency Unit), no district hospital had pediatric ICU (PICU), 20% district hospital had neonatal ICU (NICU), none of the district hospital had neuro-ICU and no district hospital had cardiac ICU as shown in table 14 and figure 12.

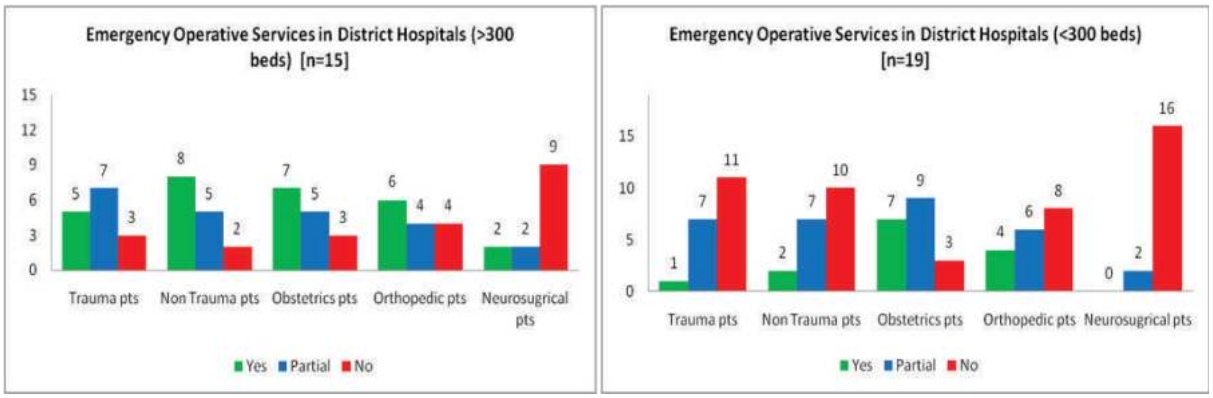


Figure 12: *Representation of Hospital Critical Care Services at District Hospitals*

iii) Specialized Care Services

Other than ICU, hospitals have some specialized care services, which were also assessed. For District hospitals (>300 beds), it was observed that 3 hospitals had cardiac cath lab, 2 hospitals had facility for emergency CABG services, and other specialized services were not found in district hospitals and specialized services are not even expected in district hospitals (table 15 and figure 13).

Table 15: Summary of Specialized Care Services in District Hospitals

Specialized Care Services	District Hospitals (> 300 beds) (n = 15)			District Hospitals (< 300 beds) (n = 19)		
	Yes	Partial	No	Yes	Partial	No
Cardiac Cath Lab	3	1	8	0	0	18
Intervention Radiology	0	2	9	0	1	17
Intervention Neuro-radiology with DSA	0	1	10	0	0	17
Facility for Emergency CABG Service	2	1	9	0	0	17
Facility for Radiofrequency Ablation Service	0	0	11	0	0	17

**n: total number of hospitals which shared data with assessor's team, DSA: Digital Subtraction Angiography, CABG: Coronary Artery Bypass Graft*

Best Practices for Specialized Care Services at Hospitals

Cardiac Cath Lab:

1. Dr Shyam Prasad Mukharji Civil Hospital, Lucknow
2. Indira Gandhi General Hospital, Puducherry
3. Southern Railway Hospital, Chennai
4. District Hospital, Tenali*

Intervention Radiology:*

1. District Hospital, Baramulla
2. Puri District Hospital, Odisha
3. Indira Gandhi General Hospital, Puducherry

Intervention Neuroradiology service with DSA:

4. Indira Gandhi General Hospital, Puducherry*

Facility for Emergency CABG services:

1. District Hospital, Tenali
2. Southern Railway Hospital, Chennai
3. Indira Gandhi General Hospital, Puducherry*

**Facilities were present but not available for 24 hours due to lack of staff and equipments*

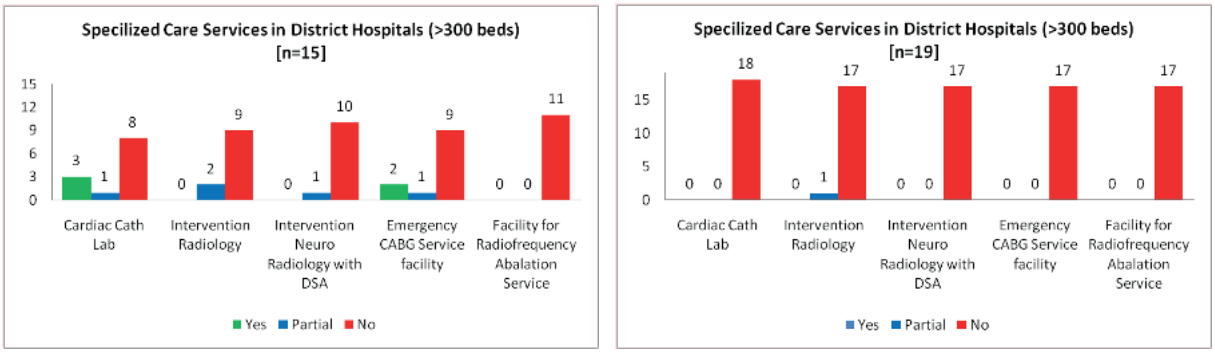


Figure 13: Representation of Hospital Specialized Care Services in District Hospitals

Suggestions:

1. District hospitals >300 beds should have trauma, non-trauma operative services, general ICU (Intensive Care Unit), HDU (High Dependency Unit), NICU (Neonatal ICU) and PICU (Pediatric ICU).
2. District hospitals <300 beds should have general operative services, general ICU (Intensive Care Unit) / HDU (High Dependency Unit) and NICU (Neonatal ICU).
3. District hospitals may be upgraded into multi-speciality hospitals to improve the quality of care.

12. AMBULANCE SERVICES:

12.1 Available ambulances in hospitals:

A total of 94 ambulances were recorded in 34 district hospitals, out of which 72 were functional, 11 were non-functional and the data of 11 ambulances were not known.

Out of these 72 functional ambulances, 30 ambulances were ALS (Advanced Life Support), only 8 ambulances were BLS (Basic Life Support), and 34 ambulances were neither ALS nor BLS (other transport vehicles).

Table 16: Summary of available Ambulances at District Hospitals

Hospital Ambulance Services	District Hospitals (>300 beds) (n=15)		District Hospitals (<300 beds) (n=19)	
Total Ambulances	42	45%	52	55%
Functional	27	64%	45	87%
ALS	4	10%	7	13%
BLS	11	26%	0	0%
Other Transport Vehicles	13	48%	17	38%
Non-Functional	4	15%	4	9%
Data Not Known	10	37%	24	53%

**n: number of assessed hospitals, ALS: Advanced Life Support, BLS: Basic Life Support*

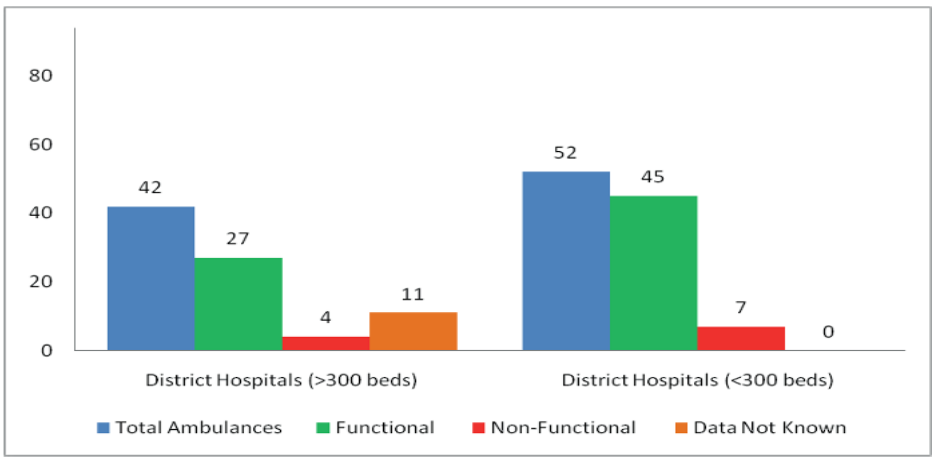


Figure 14: *Figure14: Representation of available Ambulances Status at District Hospitals*

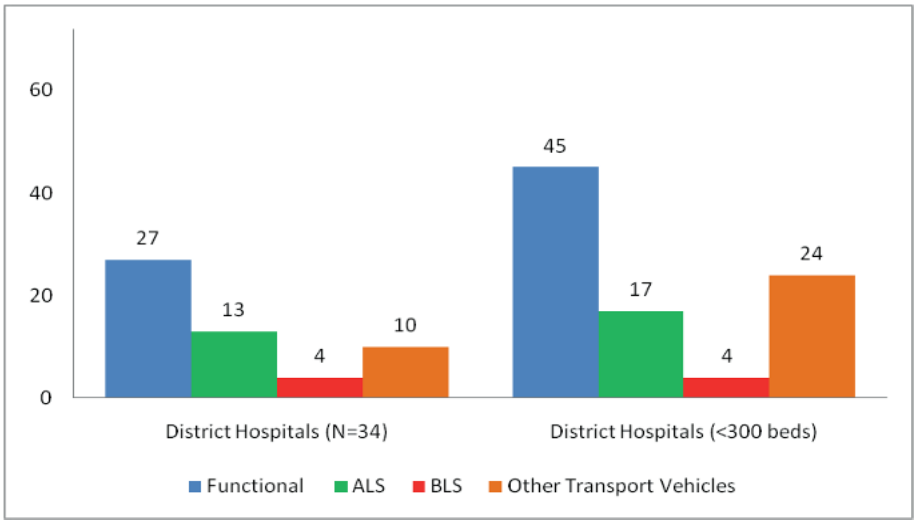


Figure 15: *Figure15: Representation of types of Ambulances at District Hospitals*

It was observed that ~23% of the ambulances were ALS of all the functional ambulances at district hospitals, while only 10% patients require ALS (red triaged patients) ambulances.

Suggestions:

1. The in-hospital ambulances should be optimally utilized in the **common resource pool of EMS** (Emergency medical Service) of the region as per requirement.
2. Regular maintenance of ambulances should be done.
3. The ALS ambulances can be used for mobile stroke unit as well as for STEMI programme.

12.2 Hospital Ambulance Services:

It was observed that out of 34 hospitals, 30 had in-house ambulances. Only 3% hospitals get pre-hospital arrival notification af ambulances at the hospital.Only 3% hospital had trained paramedics as per the level of ambulance services.

Only 12%hospitals had tele-Medicine facility out of all 34 hospitals (table 17 and figure16).

Table 17: Table 17: Summary of Ambulance Services at District Hospitals

Ambulance Services	District Hospitals (> 300 beds) (n = 15)			District Hospitals (< 300 beds) (n = 19)		
	Yes	Partial	No	Yes	Partial	No
Ambulances in Hospital	12	0	1	18	0	1
Pre Hospital Notification	0	2	12	1	5	13
Trained Paramedics for Ambulances	0	4	11	1	5	13
Mobile Stroke Unit	0	1	13	0	0	19
Tele Medicine Facility	2	2	11	2	1	15

**n = number of hospitals*

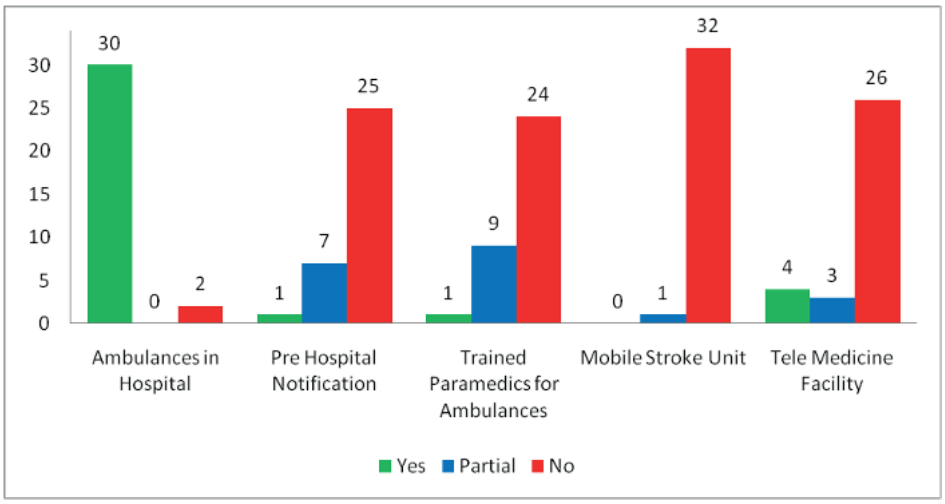


Figure 16: *Representation of Ambulance Services at District Hospitals*

12.3 Use of Ambulances by Hospitals:

It was observed that mostly hospitals used the ambulances for inter-transfer of patients to other hospitals while a few number of ambulances used the ambulances to drop the patient (figure 17).

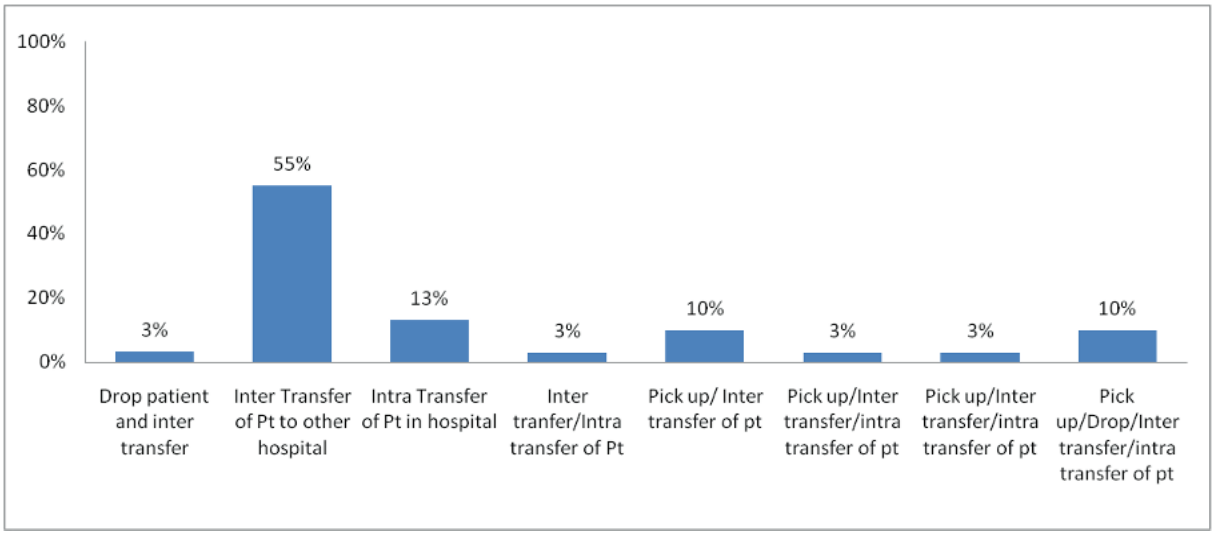


Figure 17: *Use of Ambulances in District Hospitals*

12.4 Patient transfer in absence of hospital ambulance:

It was found that in absence of hospital ambulance patient transfer takes place by private ambulances in most hospitals, sometimes patient have to go by their own vehicles and sometimes it takes place by 108 or 102 ambulances (figure 18).

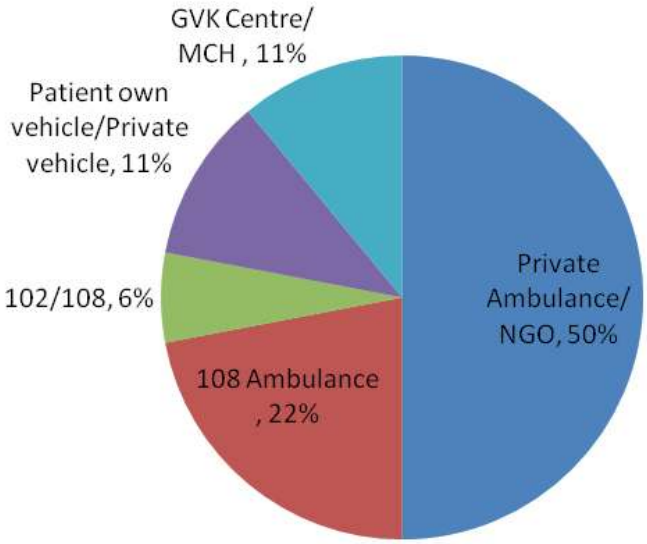


Figure 18: *Representation of Patient transfer in case district hospitals does not have ambulance service*

It was observed that 2 hospitals did not have hospital ambulances *(District Hospital, Baramulla, J&K and North Goa District Hospital, Goa),* because they had centralized state government ambulance system while 2 hospitals did not share their ambulance data with our assessor's team.

Best Practices for Hospital Ambulance Services:

- North Goa District Hospital have GVK centre which has a Centralized ambulance services in Goa.

Suggestions:

1. Create National Pre-hospital care guidelines.
2. Capacity building of existing paramedics by structured training program.
3. Creation of EMT (Emergency Medical Technician) course as a residency programme.
4. Dedicated job creation for EMT with performance based promotional ladder.
5. Establish Paramedic Council of India as regulatory body

13. ED PROTOCOL / SOP / GUIDELINES:

In a healthcare facility, a protocol, also called a medical guideline, is a set of instructions which describe a process to be followed to investigate a particular set of findings in a patient, or the method which should be followed to control a certain disease.

Table 18: Summary of ED Protocol / SOP / Guidelines at District Hospitals

Protocol/SOP/Guidelines for ED	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Yes	Partial	No	Yes	Partial	No
Emergency Manual	4	4	7	3	3	13
Policies and procedures for patient transfer in	1	6	8	2	3	14
Policies and procedures for patient transfer out	1	8	6	1	6	12
Discharge Summary to patients	6	3	6	5	6	8
Policy on handling death cases	8	4	3	7	7	4
Disaster Management Plan	5	3	7	4	3	10
Triage Policy in ED	2	1	12	4	0	15

**n: number of hospitals, ED: Emergency Department

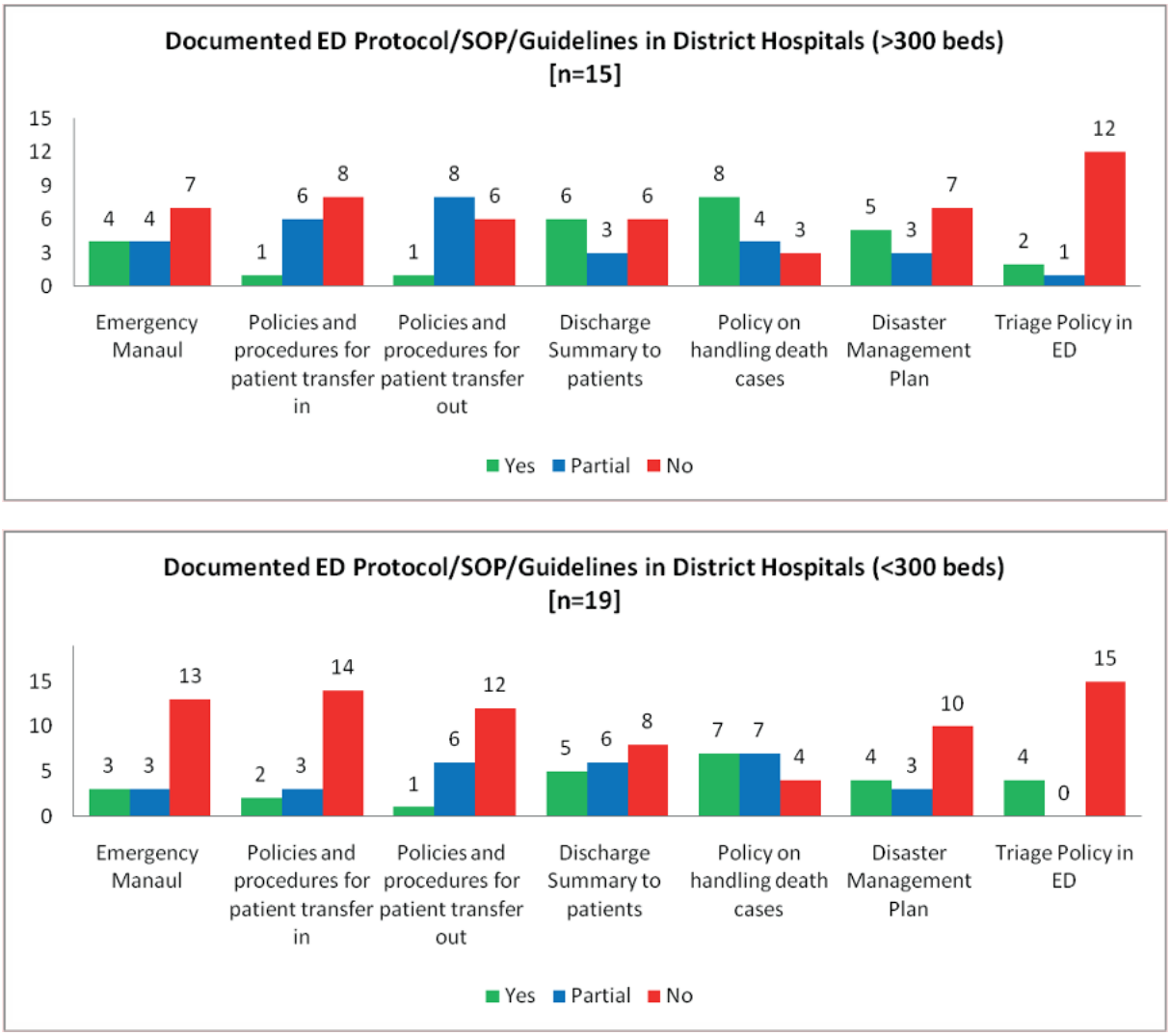


Figure 19: *Representation of ED Protocol / SOP / Guidelines at District Hospitals*

It was observed that 20% district hospitals had documented emergency manual, 8% district hospitals had documented policies and procedures for patient transfer in, 5% district hospitals had documented policies and procedures for patient transfer out, 32% district hospitals gave discharge summary to patients, 44% district hospitals had policy on handling cases of death, 26% district hospitals had documented disaster management plan, and only 17% district hospitals *(Jamanabai General Hospital, Gujarat; Civil Hospital, Aizawl, Mizoram; District Hospital, Pasighat, Arunachal Pradesh; District Hospital, Singtam, Sikkim; Southern Railways Hospital, Chennai and HNB Base Hospital, Uttarakhand)*had triage policy in ED (table 18 and figure 19).

14. EMERGENCY CARE PROTOCOLS:

In hospital emergency, some emergency care protocols are present which indicates alert system for different diseases. 12% district hospitals *(District Hospital, Baramulla, J&K; Government District Hospital, Tenali; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow and Government Multispeciality Hospital, Sector 16, Chandigarh)* had alert system for cardiac arrest, 3% district hospital had alert system for trauma, 3% district hospital had alert system for chest pain, only 3%district hospital had alert system for sepsis and 5% district hospitals had alert system for stroke (table 19 and figure 20).

Table 19: Summary of Emergency Care protocols in District Hospitals

Emergency Care Protocols	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Yes	Partial	No	Yes	Partial	No
Code Blue: Cardiac Arrest	4	0	11	0	0	19
Trauma	1	1	13	0	0	19
Chest Pain	1	0	14	0	0	19
Sepsis	1	2	12	0	0	19
Stroke	2	0	13	0	0	19

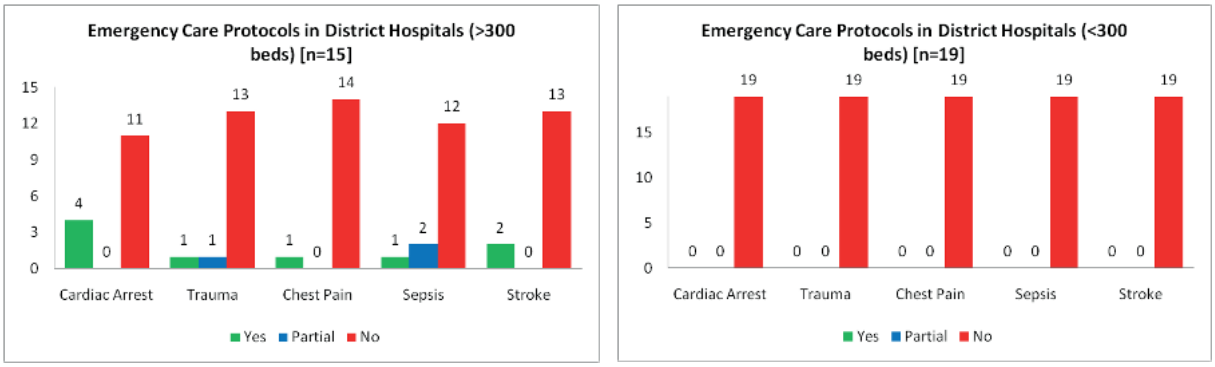


Figure 20: *Representation of Emergency Care protocols in District Hospitals*

Suggestions:

1. Development of academic residency programme

2. Implementation of triage policy in each hospital
3. NABH Accreditation

15. MEASURES ENSURING SAFETY & SECURITY IN HOSPITALS:

Several safety aspects were assessed for Emergency which is mentioned in the below table and figure. It was observed that majority of hospitals did not have periodic training of staff and periodic mock drill was also not conducted regularly.

Table 20: Summary of Safety & Security in District Hospitals

Safety & Security measures	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Yes	Partial	No	Yes	Partial	No
Fire Safety	7	7	1	7	10	2
Building Safety	7	4	4	7	6	5
Electrical Safety	8	4	3	10	6	3
Patient and Provider Safety	7	5	3	7	6	5
Chemical Safety	6	5	4	8	8	3
Periodic Training of Staff	4	6	5	2	13	4
Periodic Mock Drill	4	4	7	2	11	6
Police Post Available in Premises	12	0	3	5	4	10
Alarm Bell/Code Announcement in ED	4	1	9	1	2	16

n = number of hospitals, ED = Emergency Department

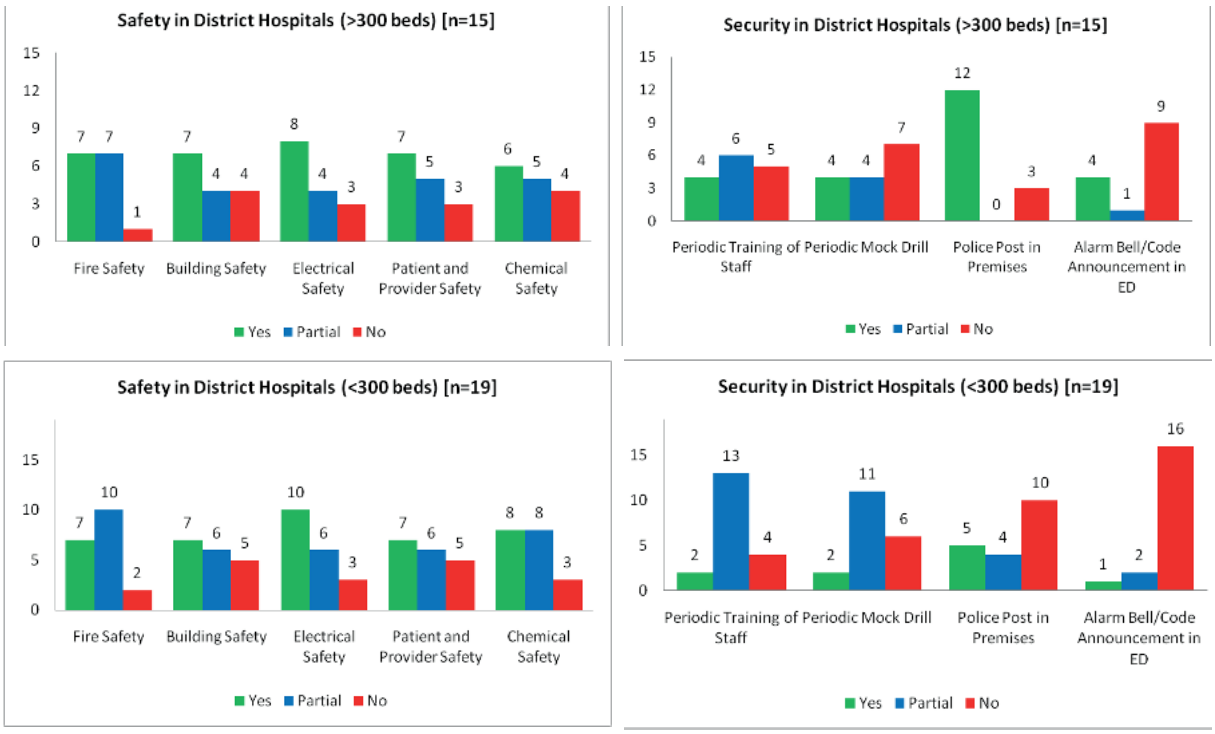


Figure 21: *Representation of Safety & Security in District Hospitals*

16. DISASTER MANAGEMENT:

Hospital disaster management provides the opportunity to plan, prepare and when needed enables a rational response in case of disasters/ mass casualty incidents. Disasters and mass casualties can cause great confusion and inefficiency in the hospitals.

Table 21: Summary of preparedness/readyness for Disaster Management at District Hospitals

Disaster Management	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Yes	Partial	No	Yes	Partial	No
Disease Management Outbreak Plan	6	3	6	1	7	11
Surge Capacity	7	3	5	1	9	9
Separate Decontamination Area at ED entrance	1	1	13	0	2	17
Separate Disaster Stock in ED	7	1	7	2	5	12
Drill and Debriefing for Disaster Management	5	3	7	1	3	15
Redistribution of pts to other hospitals	6	4	4	4	4	11

*n=number of hospitals, ED=Emergency Department

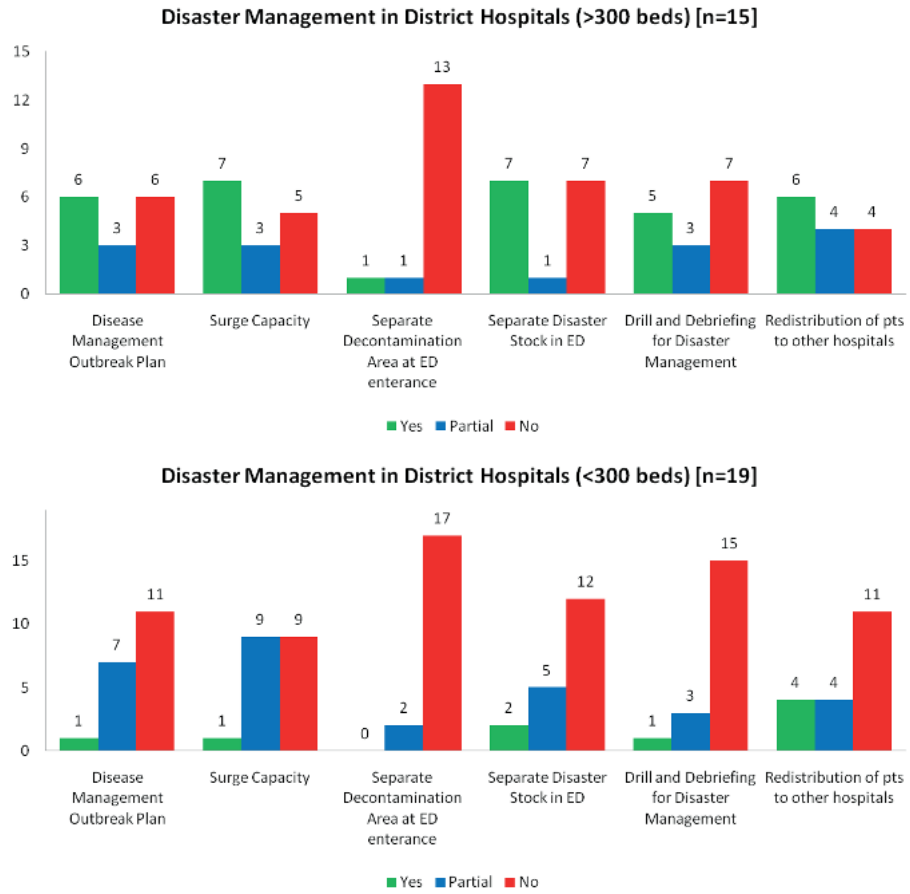


Figure 22: *Representation of preparedness/readyness for Disaster Management at District Hospitals*

In district hospitals >300 beds, it was observed that only 18% district hospitals had documented disease outbreak management plan, 20% district hospitals had surge capacity, only 3% district hospital *(Government Multispeciality hospital, Sector-16, Chandigarh)*had separate decontamination area for ED entrance, 20% district hospitals had separate disease stock in ED, 15% district hospitals conducted drill and debriefing for disaster management, and 18% district hospitals had system to redistribution of patients to other hospitals during disaster as shown in table 21 and figure 22.

In district hospitals <300 beds, it was observed that only 3% district hospital *(Coronation Hospital, Dehradun)* had documented disease outbreak management plan, 3% district hospital *(District Hospital, Ganderbal)* had surge capacity, none of the district hospital had separate decontamination area for ED entrance, 5% district hospitals *(Civil Hospital, Aizawl, Mizoram and Coronation Hospital, Dehradun)*had separate disease stock in ED, 3% district hospital *(Civil Hospital, Aizawl, Mizoram)*conducted drill and debriefing for disaster management, and 12% district hospitals had system to redistribution of patients to other hospitals during disaster.

Suggestions:

1. There should be standard protocols for implementation of in-hospital disaster management plan
2. Implementation of hospitals preparedness for both external and internal disaster management.
3. There should be separate decontamination area at entrance of emergency department.
4. Every hospital should have surge capacity with separate disaster stock in emergency department.
5. There should be periodic drills and debriefing for disaster management.
6. Regular monitoring and evaluation of implementation of disaster management protocols should be done by national disaster management authority.

17. CONTINUOUS QUALITY IMPROVEMENT

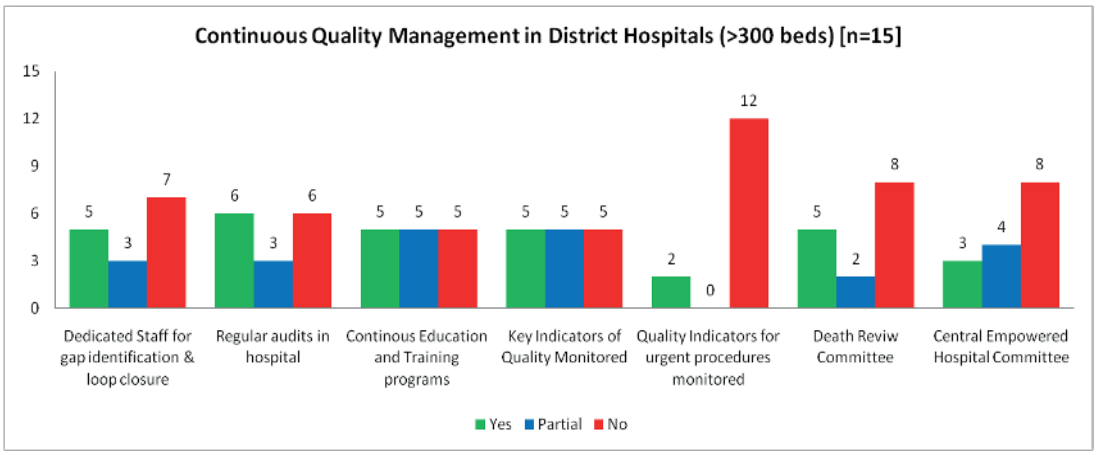
It is a process of creating an environment in which management and workers strive to create constantly improving quality. The purpose of continuous quality improvement programs is to improve health care by identifying problems, implementing and monitoring corrective action and studying its effectiveness.

Table 22: Summary of Continuous Quality Improvement in District Hospitals

Continuous Quality Improvement	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Yes	Partial	No	Yes	Partial	No
Dedicated Staff for gap identification & loop closure	5	3	7	3	4	12

Regular audits in hospital	6	3	6	5	8	6
Continuous Education and Training programs	5	5	5	0	9	10
Key Indicators of Quality Monitored	5	5	5	4	13	2
Quality Indicators for urgent and interventional procedures monitored	2	0	12	1	2	16
Death Review Committee	5	2	8	4	5	10
Central Empowered Hospital Committee	3	4	8	4	4	11

**n = number of hospitals*



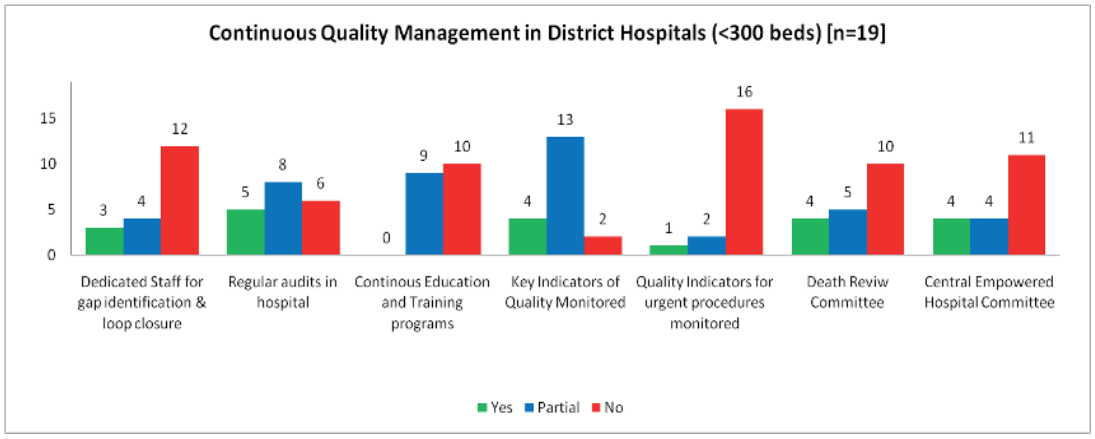


Figure 23: *Representation of Continuous Quality Improvement in District Hospitals*

Out of 15 district hospitals >300 beds, following were observed

1. 5 hospitals had dedicated staff for identification and loop closure (Jallianwala Bagh Matyr Memorial Hospital, Amritsar; District Hospital, Baramulla, J&K; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow; Government Multispeciality Hospital, Sector 16 and Deen Dayal Upadhyay Hospital, H.P.)
2. 6 hospitals undergo regular audits (Jallianwala Bagh Matyr Memorial Hospital, Amritsar; District Hospital, Baramulla, J&K; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow; Government Multispeciality Hospital, Sector 16; HNB Base Hospital and Deen Dayal Upadhyay Hospital, H.P.)

3. 5 hospitals had continuous education and training programs (Civil Hospital, Shillong; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow; Southern Railways Hospital, Chennai; District Hospital, Baramulla, J&K and Deen Dayal Upadhyay Hospital, H.P.)
4. 5 hospitals had key indicators for quality monitored (Civil Hospital, Shillong; District Hospital, Baramulla, J&K; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow; Southern Railways Hospital, Chennai and Deen Dayal Upadhyay Hospital, H.P.)
5. 2 hospitals had quality indicators for urgent and interventional procedures monitored (District Hospital, Baramulla, J&K and Government Multispeciality Hospital, Sector 16)
6. 5 hospitals had death review committee (Jallianwala Bagh Matyr Memorial Hospital, Amritsar; District Hospital, Baramulla, J&K; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow; Government Multispeciality Hospital, Sector 16 and Deen Dayal Upadhyay Hospital, H.P.)
7. 3 hospitals had central empowered hospital committee for continuous quality improvement for emergency services (Jallianwala Bagh Matyr Memorial Hospital, Amritsar; District Hospital, Baramulla, J&K and Government Multispeciality Hospital, Sector 16)

Out of 19 district hospitals <300 beds, following were observed:

1. 3 hospitals had dedicated staff for identification and loop closure (Civil Hospital, Aizawl, Mizoram; District Hospital, Ganderbal and District Hospital, Singtam)
2. 5 hospitals undergo regular audits (Civil Hospital, Aizawl, Mizoram; District Hospital, Pasighat; District Hospital, Singtam; District Hospital, King Koti and North Goa District Hospital)
3. None of the hospital had continuous education and training programs
4. 4 hospitals had key indicators for quality monitored (Civil Hospital, Aizawl, Mizoram; District Hospital, Singtam; District Hospital, King Koti and North Goa District Hospital)
5. Only 1 hospital had quality indicators for urgent and interventional procedures monitored (North Goa District Hospital)
6. 4 hospitals had death review committee (Civil Hospital, Aizawl, Mizoram; District Hospital, Pasighat; District Hospital, Singtam and North Goa District Hospital)
7. 4 hospitals had central empowered hospital committee for continuous quality improvement for emergency services (Civil Hospital, Aizawl, Mizoram; District Hospital, Singtam; District Hospital, King Koti and North Goa District Hospital)

Best Practices for Continuous Quality Management:

The best practice for continuous quality management was observed in ***District Hospital, Baramulla.***

Suggestions:

1. There should be **dedicated quality manager** for gap identification and loop closure
2. **Develop a quality council** among emergency care providers
3. **Mandatory Emerald certification under NABH**
4. **Regular mortality and morbidity meeting**
5. Regular **third party audit** of external agencies by using KPI and the funding of the hospital should be linked with it
6. **Continuous training** of quality council provider as well as manager

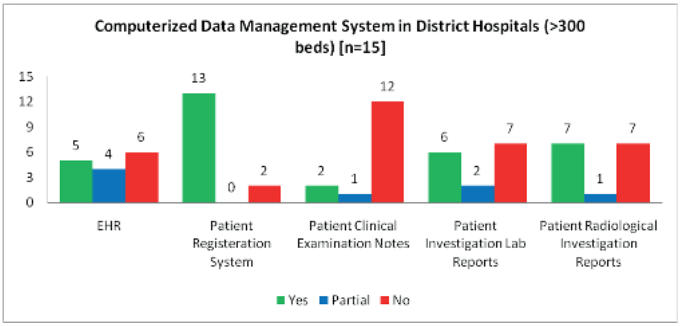
18. COMPUTERIZED DATA MANAGEMENT SYSTEM:

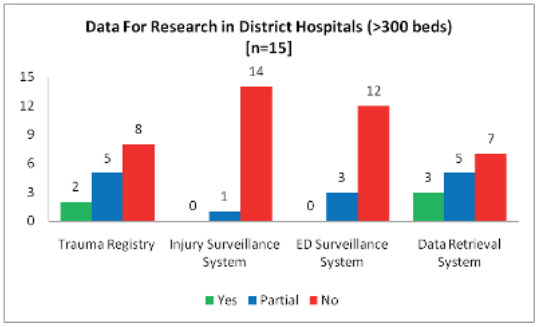
Healthcare data management is the process of storing, protecting, and analyzing data pulled from diverse sources. Managing the wealth of available healthcare data allows health systems to create holistic views of patients, personalize treatments, improve communication, and enhance health outcomes.

Table 23: Summary of Data Management System in District Hospitals

Computerized Data Management System	District Hospitals (> 300 beds) (n = 15)			District Hospitals (< 300 beds) (n = 19)		
	Yes	Partial	No	Yes	Partial	No
EHR	5	4	6	4	6	9
Patient Registration System	13	0	2	9	2	8
Patient Clinical Examination Notes	2	1	12	0	1	18
Patient Investigation Lab Reports	6	2	7	3	3	13
Patient Radiological Investigation Reports	7	1	7	2	5	11
Trauma Registry	2	5	8	1	2	16
Injury Surveillance System	0	1	14	1	0	18
ED Surveillance System	0	3	12	0	1	18
Data Retrieval System	3	5	7	1	3	15

**n: number of hospitals, ED: Emergency Department, HER: Electronic Health Record*





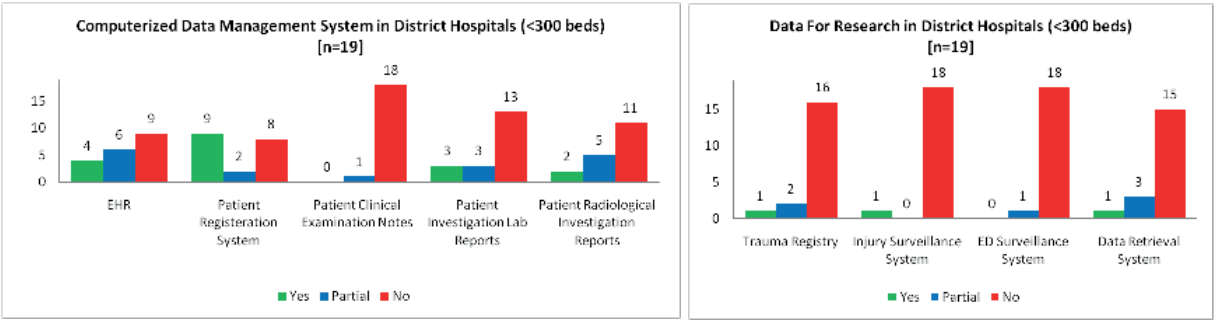


Figure 24: *Representation of Data Management System in District Hospitals*

Out of 34 district hospitals, 9 hospitals had electronic health record (EHR), 22 hospitals had computerized patient registration system, only 2 hospitals *(Dr Shyam Prasad Mukharji Civil Hospital, Lucknow and Jai Prakash Narayan District Hospital, Bhopal)* had computerized patient clinical examination notes, 9 hospitals had computerized patient investigation lab reports and 9 hospitals had computerized patient radiological investigation reports.

In addition, it was also observed that 3 hospitals had trauma registry *(Civil Hospital, Shillong; Puri District Headquarter Hospital, Orissa and HNB Base Hospital)*, only 1 hospital had injury surveillance system *(Puri District Headquarter Hospital)*, no hospital had emergency department surveillance system, and 4 hospitals had data retrieval system for quality improvement & research *(Civil Hospital, Aizawl, Mizoram; District Hospital, Baramulla, J&K; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow and Deen Dayal Upadhyay Hospital, H.P.)*.

Note: Though hospitals have answered yes for trauma registry but many of them do not understood it's meaning

Suggestions:

1. Develop National Emergency Department Information System (EDIS)
2. **Implement and integrate the computerized care delivery template** which will serve as clinical notes, registry and surveillance
3. It will use the data for quality improvement initiative and research
4. Develop various emergency conditions registries such as cardiac arrest, poisoning, snake bite including trauma registry

19. FINANCING:

A) Financial Status:

It was observed that none of the hospitals received dedicated funds for emergency department because of lack of dedicated emergency department in hospitals. Some hospitals received funds from state such as funds for trauma.

Table 24: Summary of Financing at District Hospitals

Financing	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=19)		
	Sufficient Funds	Not Sufficient Funds	No Funds	Sufficient Funds	Not Sufficient Funds	No Funds
Central Govt. Funds for ED Services	0	3	11	0	4	13
State Govt. Funds for ED Services	4	5	5	3	7	7

*n: number of hospitals

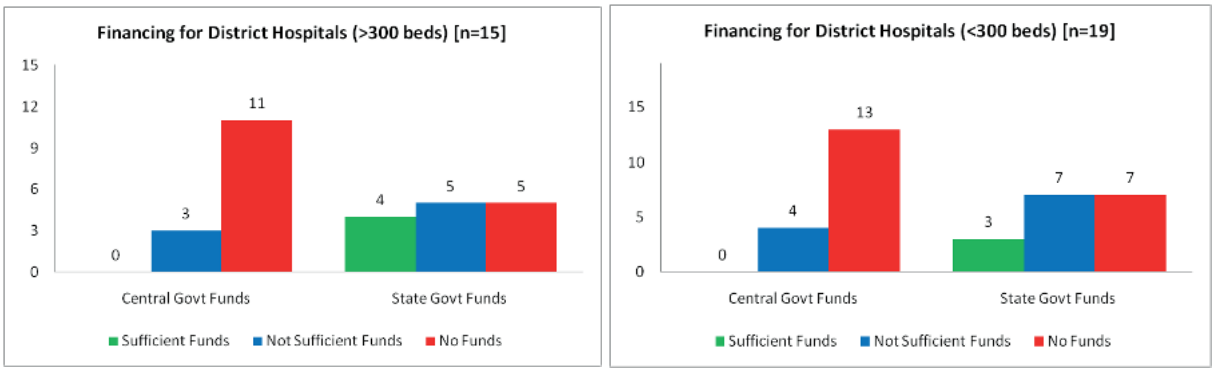


Figure 25: *Representation of Financing in District Hospitals*

B) Status of funds

It was observed that some hospitals received funds on time others did not received on time and in most of the hospital's funds are not fully utilized as depicted in the below table and figure.

Table 25: Summary of Financial Status in District Hospitals

Financial Status	District Hospitals (>300 beds) (n=15)		District Hospitals (<300 beds) (n=19)	
	Yes	No	Yes	No
Full Utilisation of Funds	5	8	6	10
Delay in Release of Funds	3	10	2	14

*n: number of hospitals

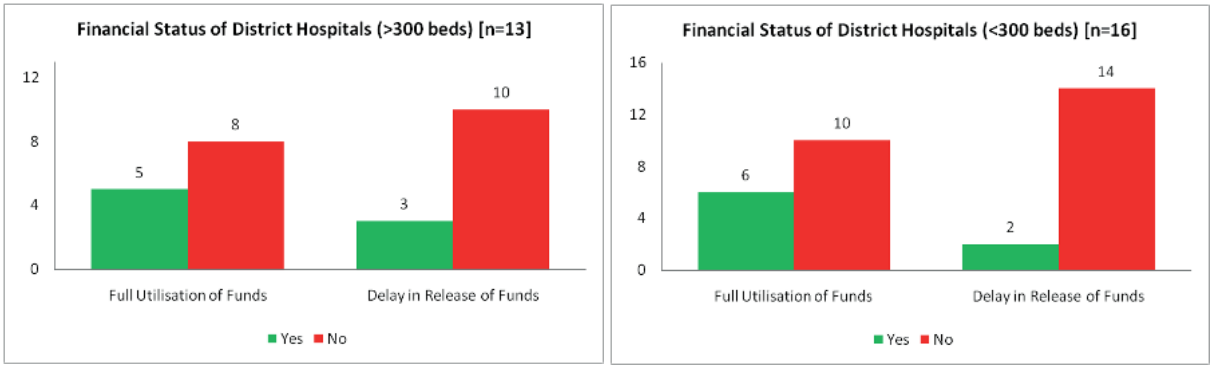


Figure 26: *Representation of Financial Statusin District Hospitals*

Suggestions:

1. Protected funding for emergency and injury care services and for establishment of residency programme in emergency medicine, emergency nursing and EMT (Emergency Medical Technician) course
2. Integration and aggregation of financial schemes for emergency and injury care
3. Cashless scheme- Increase Ayushman Bharat scheme for all red-triaged patients in all hospitals

20. PHYSICAL INFRASTRUCTURE:

In hospitals, patients seek medical treatment and staff provides continuous support by creating a healing environment with the support of appropriate physical aspects. A healthy hospital environmental is found to have an impact on the quick recovery of diseases.

In this study, consensus based tool was developed which includes a checklist for physical infrastructure of Emergency Department. The observations of physical infrastructure are given in the table 26, 27.

Table 26: Overall Summary of Physical Infrastructure of Emergency Department of District Hospitals (n = 34)

Checklist	Yes	Partial	No	Checklist	Yes	Partial	No
Easy & Direct Access to ED	16	13	5	**Emergency Department with Adequate Space**	10	13	11
Road of Hospital is Wide enough	17	11	6	**Demarcated area for triage**	2	6	26
Parking in front of ED	13	12	9	**Demarcated station for doctors and nurses**	10	11	13
Separate Access for ambulances	8	16	10	**Demarcated plaster room**	17	5	12
Parking for ambulance, staff & public	15	11	7	**Dedicated isolation room**	4	3	27
Smooth entry area with wheel chair, trolley &stretcher	16	13	5	**Dedicated minor OT**	17	6	11
Pt attendant at entrance to help pt	7	14	13	**Provision for emergency OT**	12	8	13
Seamless flow of patient	10	14	10	**Point of Care Lab in ED**	2	4	28
Services for pts are defined and displayed	18	7	9	**Linkage to other facility on same floor**	10	12	11
Names of doctors and staff are displayed	11	18	5	**Separate room for sexual Assault victim**	10	1	23

Important telephone numbers are displayed	12	13	9	**Availability of sexual assault forensic evidence kit**	13	2	19
Relevant information is displayed for pts and visitors	12	14	8	**Counselling service for sexual assault/ domestic violence cases**	7	4	23
Adequate waiting area	13	12	9	**Demarcated area for keeping dead bodies**	13	8	13
Safe Drinking Water	18	11	5	**Clean Utility room**	12	9	12
Functional male toilets	21	11	2	**Dirty utility room**	13	9	12
Functional female toilets	21	11	2	**Store**	25	7	2
Functional toilets with wheel chair	6	7	21	**Curtains at point of care**	15	12	7
Clean facility with maintenance	14	17	3	**Demarcated duty room for doctors**	25	7	2
Cafeteria facility	13	9	12	**Demarcated duty room for nursing staff**	25	9	0
Police Control Room	18	4	12				
Emergency registration counter	17	7	10				
Ambulance driver's room	23	1	10				

It was observed that only 8 district hospitals had separate access for ambulance services, 15 district hospitals had designated area for ambulance, only 2 district hospitals had demarcated area for triage, 10 district hospitals had emergency department with adequate space, 17 hospitals had dedicated emergency OT, only 2 district hospitals had point of care lab in ED, 18 district hospitals had police control room.

Standard for physical infrastructure emergency mainly defines the access to ER, parking, staff service at doorstep, clinical services provided, facilities available, information display and facility upkeep. The hospitals conformed to the parameters of easy and direct access to ER, designated parking for ambulance, staff and public, but 13 hospitals parked vehicle in front of ER and 12 hospitals showed partial compliance to this objective. The hospitals (47%) showed compliance, 38% however partial compliance to parameter of smooth entry to emergency like ramp for stretchers, canopy and availability of staff at entrance to help patient with wheelchair and stretchers.

The patient care assistant of mostly hospitals was found to attend only critical and unattended patients from ambulances. The information board displaying services being provided was found missing from 9 hospitals and 7 hospitals partially fulfilled the requirement by exhibiting only partial information. Similarly display of names of doctors and staff on duty, important telephone numbers along with relevant information were found missing from most of the hospitals. 13 hospitals have adequate waiting area. Mostly hospitals have functional male and female toilets but only 6 district hospitals have functional toilet with wheel chair out of all 34 hospitals. 12 hospitals do not have police post available in hospital premises.

There were 10 hospitals with designated emergency rooms, 13 hospitals do not have proper designated emergency room and 11 hospitals do not have any emergency room out of all 34 assessed healthcare facilities. Only 2 hospitals demarcated area for triage. Only 4 hospitals have isolation room in emergency. Similarly the point of care lab was found in only 2 hospitals.

There were no separate room for sexual assault victim in 23 hospitals, no availability of forensic evidence kit for them in 19 hospitals and no counselling service for sexual assault / domestic violence cases in 23 hospitals.

Table 27: Compliance of District Hospitals Physical Infrastructure present Inside and Outside of Emergency Department

S. No.	Name of Hospital	Standard	Maximum Score	Score Obtained	Compliance to each Standard in %	Total Compliance in %
1	**Jamanabai General Hospital**	Outside emergency	44	11	25%	**29.5%**
		Inside emergency	38	13	34%	
2	**Gomti District Hospital**	Outside emergency	44	29	66%	**54%**
		Inside emergency	38	16	42%	
3	**Civil Hospital, Shillong**	Outside emergency	44	34	77%	**72.5%**
		Inside emergency	38	26	68%	
4	**District Hospital, Peren, Nagaland**	Outside emergency	44	20	45%	**35.5%**
		Inside emergency	38	10	26%	
5	**Jallianwala Bagh Matyr Memorial Hospital, Amritsar**	Outside emergency	44	37	84%	**81.5%**
		Inside emergency	38	30	79%	
6	**Civil Hospital, Aizawl, Mizoram**	Outside emergency	44	34	77%	**63.5%**
		Inside emergency	38	19	50%	
7	**District Hospital, Pasighat**	Outside emergency	44	37	84%	**59%**
		Inside emergency	38	13	34%	
8	**District Hospital, Baramulla, Jammu & Kashmir**	Outside emergency	44	26	59%	**58.5%**
		Inside emergency	38	22	58%	
9	**District Hospital, Ganderbal**	Outside emergency	44	30	68%	**72%**
		Inside emergency	38	29	76%	
10	**District Hospital, Bishnupur, Manipur**	Outside emergency	44	35	80%	**61%**
		Inside emergency	38	16	42%	
11	**Morigaon Civil Hospital, Assam**	Outside emergency	44	20	45%	**39.5%**
		Inside emergency	38	13	34%	
12	**Government Hospital Virajpet**	Outside emergency	44	28	64%	**59.5%**
		Inside emergency	38	21	55%	

13	**District Hospital, Singtam**	Outside emergency	44	31	70%	**70.5%**
		Inside emergency	38	27	71%	
14	**District Hospital, Karim Nagar**	Outside emergency	44	25	57%	**51%**
		Inside emergency	38	17	45%	
15	**District Hospital, King Koti**	Outside emergency	44	32	73%	**65.5%**
		Inside emergency	38	22	58%	
16	**Government District Hospital, Tenali**	Outside emergency	44	28	64%	**58.5%**
		Inside emergency	38	20	53%	
17	**Govt. BDM Hospital, Kotputli**	Outside emergency	44	23	52%	**39%**
		Inside emergency	38	10	26%	
18	**Hari Baksh Kanwatia Hospital**	Outside emergency	44	20	45%	**35.5%**
		Inside emergency	38	10	26%	
19	**North Goa District Hospital**	Outside emergency	44	34	77%	**76.5%**
		Inside emergency	38	29	76%	
20	**Dr Shyam Prasad Mukharji Civil Hospital, Lucknow**	Outside emergency	44	12	27%	**32%**
		Inside emergency	38	14	37%	
21	**Government Multispeciality Hospital, Sector 16**	Outside emergency	44	25	57%	**62.5%**
		Inside emergency	38	26	68%	
22	**Civil Hospital, Sector 22**	Outside emergency	44	33	75%	**74.5%**
		Inside emergency	38	28	74%	
23	**Jai Prakash Narayan District Hospital, Bhopal**	Outside emergency	44	21	48%	**51.5%**
		Inside emergency	38	21	55%	
24	**Southern Railways Hospital, Chennai**	Outside emergency	44	22	50%	**50%**
		Inside emergency	38	19	50%	
25	**Puri District Headquarter Hospital, Orissa**	Outside emergency	44	21	48%	**54.5%**
		Inside emergency	38	23	61%	
26	**Indira Gandhi Government General Hospital, Pondicherry**	Outside emergency	44	32	73%	**63%**
		Inside emergency	38	20	53%	
27	**Sadar Hospital, Gaya**	Outside emergency	44	11	25%	**16.5%**
		Inside emergency	38	3	8%	
28	**District Hospital, Peroorkada**	Outside emergency	44	17	39%	**36.5%**
		Inside emergency	38	13	34%	
29	**General Hospital, Neyyatinkara**	Outside emergency	44	28	64%	**49%**
		Inside emergency	38	13	34%	
30	**District Hospital, Dhamtari**	Outside emergency	44	26	59%	**45.5%**
		Inside emergency	38	12	32%	

31	**District Hospital, Raipur**	Outside emergency	44	29	66%	**45%**
		Inside emergency	38	9	24%	
32	**HNB Base Hospital, Srinagar**	Outside emergency	44	34	77%	**63.5%**
		Inside emergency	38	19	50%	
33	**Coronation Hospital, Dehradun**	Outside emergency	44	15	34%	**42%**
		Inside emergency	38	19	50%	
34	**Deen Dayal Upadhyay Hospital, Himachal Pradesh**	Outside emergency	44	24	55%	**51%**
		Inside emergency	38	18	47%	

Suggestions:

1. **Uniformity of name (Emergency/Emergency Medicine Department)** in every hospital for emergency / casualty / injury care etc.
2. The **capacity and capability of ED should be standardize** based on the tier of facility, footfall of patients and academic programme
3. **Availability of either point of care lab or hospital lab (24*7) for emergency services**
4. **Adequate space for ambulance drop zone**
5. There should be **demarcated triage area**
6. There should be **small ICU** in each hospital

21. MANPOWER IN EMERGENCY DEPARTMENT:

In Emergency Department, manpower plays a very crucial role in providing care to the patients. It was observed that emergency department did not have adequate manpower that's why the quality of care is compromised in most of the district hospitals.

Table 28: Detailed Summary of Manpower in Emergency Department of District Hospitals

Overall manpower in Emergency	n	Median [IQR] Min-Max	% of manpower per footfall of 100 emergency patients	% of manpower per emergency beds in hospitals
Faculty / Consultant	10	2 [6] 1-39	2.5	75
Casualty Medical Officer	23	3 [5] 1-16	0.6	25.8
Senior Resident	2	7.5 [0.5] 7-8	0.4	147.4
Junior Resident	5	3 [6] 1-17	1.1	37.5
Medical Officer	18	6 [3.7] 1-9	1.5	52.9

Intern	8	4 [4] 2-9	0.5	17.4
Nursing officer In-charge	29	1 [1] 1-18	0.4	16.5
Staff Nurse / Nursing officer	29	6 [7] 1-165	1.3	62.5
Radiology Technician	12	2.5 [2.2] 1-6	0.3	32.1
Lab Technician	15	3 [5] 1-12	1.7	50
OT Technician	7	2 [0.5] 1-3	0.8	13.6
H.A. / G.D. A.	14	3 [1] 1-9	0.5	17.6
Housekeeping Staff	21	3 [0] 1-29	1.2	29.5
EMT	4	1.5 [1.5] 1-4	0.7	24.3
Security	24	3 [3] 1-9	0.6	30.8
Registration Staff	22	2.5 [3] 1-35	0.4	22.5
Any Other	2	3 [1] 2-4	0.8	100

*(*n: number of hospitals, GDA: General Duty Assistant, SA: Sanitary Attendant, HA: Housekeeping Attendant)*

The manpower in emergency was recorded and it was observed that many district hospitals had less manpower in emergency. The percentage of manpower was calculated as per the footfall of patients in emergency department as well as per emergency beds available in hospitals.

21.1. Other Specialist / Super Specialist Available in Hospital:

In this study, the number of specialist and super specialist were also recorded for the district hospitals. It was observed that the hospitals were having adequate number of specialist and super specialist in the hospital but the number of doctors in the emergency department was not found enough.

Table 29: Overall Summary of Other Specialist / Super Specialist available in District Hospitals (n = 34)

Department	Designation	Timings	Median [IQR] Min-Max	Department	Designation	Timings	Median [IQR] Min-Max
Medicine	Consultant	During OPD Hours only	2 [2] 1-8	Cardiology	Consultant	During OPD Hours only	4 [2] 2-6
		24 x 7 Physically Present	3 [1.5] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 2-4			On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	3 [0] 3-3			Empanelled / As and when required	3 [0] 3-3
	Resident	During OPD Hours only	4 [3] 2-7		Resident	During OPD Hours only	0
		24 x 7 Physically Present	3 [1.5] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 3-3			On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	5 [0] 5-5			Empanelled / As and when required	0
General Surgery	Consultant	During OPD Hours only	2.5 [3.5] 1-9	CTVS (Cardiac Surgery)	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	2.5 [1.2] 2-4			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 1-3			On Call during Non-OPD Hours	3 [1] 1-3
		Empanelled / As and when required	3 [0] 3-3			Empanelled / As and when required	3 [0] 3-3
	Resident	During OPD Hours only	4 [4] 2-9		Resident	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	2.5 [1.7] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	0
Pediatrics	Consultant	During OPD Hours only	2 [1] 1-9	Neurology	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	1.5 [1.2] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 1-5			On Call during Non-OPD Hours	3 [1] 1-3
		Empanelled / As and when required	3 [0] 3-3			Empanelled / As and when required	3 [0] 3-3

Pediatrics	Resident	During OPD Hours only	4 [0] 1-6	Neurology	Resident	During OPD Hours only	0
		24 x 7 Physically Present	3 [1.5] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	0
Gynaecology & Obstetrics	Consultant	During OPD Hours only	2 [2.2] 1-10	Neurosurgery	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	3 [0.7] 2-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 1-7			On Call during Non-OPD Hours	3 [1] 1-3
		Empanelled / As and when required	3 [0] 3-3			Empanelled / As and when required	3 [0] 3-3
	Resident	During OPD Hours only	5 [1] 1-5		Resident	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	3 [0.7] 2-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	2 [1] 1-3			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	0
Orthopedics	Consultant	During OPD Hours only	1 [2] 1-6	Plastic Surgery	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	3 [1] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 1-3			On Call during Non-OPD Hours	3 [1] 1-3
		Empanelled / As and when required	3 [0] 3-3			Empanelled / As and when required	3 [0] 3-3
	Resident	During OPD Hours only	5.5 [0.5] 5-6		Resident	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	1.5 [1.2] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	0

Radiology	Consultant	During OPD Hours only	1.5 [1.7] 1-4
		24 x 7 Physically Present	2 [1] 1-3
		On Call during Non-OPD Hours	3 [1] 1-3
		Empanelled / As and when required	3 [0] 3-3
	Resident	During OPD Hours only	1.5 [0.5] 1-2
		24 x 7 Physically Present	1 [1] 1-3
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
Anesthesia	Consultant	During OPD Hours only	2 [3.7] 1-9
		24 x 7 Physically Present	3 [1.5] 1-4
		On Call during Non-OPD Hours	3 [0] 1-3
		Empanelled / As and when required	3 [0] 3-3
	Resident	During OPD Hours only	4 [2] 1-9
		24 x 7 Physically Present	2 [2] 1-3
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
Critical Care	Consultant	During OPD Hours only	4 [4] 1-7
		24 x 7 Physically Present	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	0
Maxillofacial Surgery	Consultant	During OPD Hours only	2 [0] 2-2
		24 x 7 Physically Present	1 [0] 1-1
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
	Resident	During OPD Hours only	2 [0] 2-2
		24 x 7 Physically Present	1 [0] 1-1
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
Gastroenterology	Consultant	During OPD Hours only	2 [0] 2-2
		24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	0
	Resident	During OPD Hours only	2 [0] 2-2
		24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
Nephrology	Consultant	During OPD Hours only	2 [0] 2-2
		24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [1] 1-3
		Empanelled / As and when required	3 [0] 3-3

Critical Care	Resident	During OPD Hours only	2 [0] 2-2	Nephrology	Resident	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	3 [0] 3-3			24 x 7 Physically Present	3 [0] 3-3
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	1 [0] 1-1
		Empanelled / As and when required	0			Empanelled / As and when required	0
Opthalmology	Consultant	During OPD Hours only	1.5 [2.2] 1-5	Urology	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	2 [2] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 3-6			On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	0			Empanelled / As and when required	0
	Resident	During OPD Hours only	3 [2] 1-5		Resident	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	2.5 [1.7] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	0			Empanelled / As and when required	0
ENT	Consultant	During OPD Hours only	1 [1.5] 1-6	Neuro Radiology	Consultant	During OPD Hours only	0
		24 x 7 Physically Present	1 [0.5] 1-2			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 1-3			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	3 [0] 3-3
	Resident	During OPD Hours only	2.5 [1.5] 1-4		Resident	During OPD Hours only	0
		24 x 7 Physically Present	3 [1] 1-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	0

Psychiatry	Consultant	During OPD Hours only	1[1] 1-4
		24 x 7 Physically Present	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3
		Empanelled / As and when required	0
	Resident	During OPD Hours only	2 [0] 2-2
		24 x 7 Physically Present	3 [1] 1-3
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
Dermatology	Consultant	During OPD Hours only	1 [1] 1-4
		24 x 7 Physically Present	2 [1] 1-3
		On Call during Non-OPD Hours	3 [0] 1-3
		Empanelled / As and when required	0
	Resident	During OPD Hours only	4 [0] 4-4
		24 x 7 Physically Present	1 [1] 1-3
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
Forensic Medicine	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	2 [1] 1-3
		On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	3 [0] 3-3
Pediatric Surgery	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	0
	Resident	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	0
Neonatology	Consultant	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	0
	Resident	During OPD Hours only	0
		24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0
Hematology	Consultant	During OPD Hours only	1.5 [0.5] 1-2
		24 x 7 Physically Present	2.5 [0.5] 2-3
		On Call during Non-OPD Hours	0
		Empanelled / As and when required	0

Forensic Medicine	Resident	During OPD Hours only	1 [0] 1-1	Hematology	Resident	During OPD Hours only	1 [0] 1-1
		24 x 7 Physically Present	0			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	0
Lab Medicine	Consultant	During OPD Hours only	3 [1.5] 1-5	Oncology	Consultant	During OPD Hours only	0
		24 x 7 Physically Present	3 [0] 3-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	3 [0] 3-4			On Call during Non-OPD Hours	3 [0] 3-3
		Empanelled / As and when required	3 [0] 3-3			Empanelled / As and when required	0
	Resident	During OPD Hours only	0		Resident	During OPD Hours only	0
		24 x 7 Physically Present	3 [0] 3-3			24 x 7 Physically Present	0
		On Call during Non-OPD Hours	0			On Call during Non-OPD Hours	0
		Empanelled / As and when required	0			Empanelled / As and when required	0
Transfusion Medicine / Blood Bank	Consultant	During OPD Hours only	1 [0.5] 1-5				
		24 x 7 Physically Present	3 [0] 3-3				
		On Call during Non-OPD Hours	3 [0] 3-3				
		Empanelled / As and when required	0				
	Resident	During OPD Hours only	0				
		24 x 7 Physically Present	0				
		On Call during Non-OPD Hours	0				
		Empanelled / As and when required	0				

Suggestions:

7. Round the clock physical posting of Consultants/Faculty in emergency department for providing quality acute care.
8. Rotatory posting of doctors and nursing students from different disciplines including interns for a defined period in emergency under the administrative control of ED.
9. Creation of dedicated post of doctors, nurses and paramedics for emergency department.
10. Establish academic emergency medicine, emergency nursing and EMT.
11. Capacity building of emergency care providers.

22. EQUIPMENT AND SUPPLIES IN ED

22.1. Biomedical Equipment:

It assesses the availability of the equipment in accordance to the scope of service, inventory maintenance and periodic inspection & calibration of equipment. It was observed that the equipments are available according to the available services in 19 hospitals and the inventory and log books are maintained properly in 16 hospitals. The records of periodically inspection and calibration were found in 17 hospitals out of 34(table 30 and figure 27).

Table 30: Summary of Biomedical Equipment observed in 34 District Hospitals

Biomedical Equipment	District Hospitals		
	Yes	Partial	No
Equipments list with its scope of services	19	10	4
Medical equipment inventory and log book	16	14	3
Periodically inspected and calibrated equipment record	17	9	7

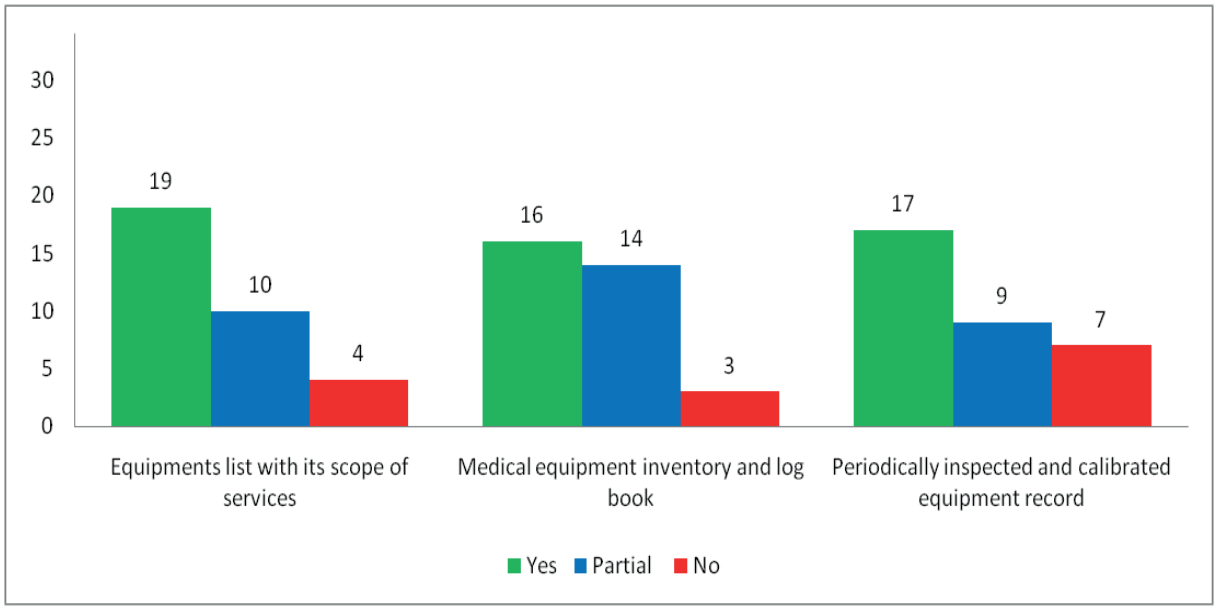


Figure 27: *Compliance of Biomedical Equipment observed in 34 District Hospitals*

22.2. Compliance of critical available equipments:

It was observed that most of the hospitals had all resuscitation/airway management equipments but basic items like cervical collar, pelvic binder and bed-sheets, broselow tape, fluid warmer were missing from most of the hospitals. It was also observed that only 23% hospitals had mobile resuscitation beds, 15% hospitals had cervical collar, 9% hospitals had transport ventilators, only 5% had Laryngeal Mask Airway, 32% hospitals had vaginal speculum and only 3% hospital had capnography.

In addition, 3% hospital had incubator, 3% hospital had emergency cricothyroidotomy kit, 3% hospital had emergency thoracotomy set and only 5% hospitals had phototherapy unit (table 31).

Table 31: Overall Summary of Equipments and Supplies list in ED available in34 District Hospitals

List of Equipments & Supplies in ED	Yes	No	List of Equipments & Supplies in ED	Yes	No
Mobile bed for resuscitation	8	26	Endotracheal tubes	21	13
Crash cart	18	16	Chest tubes with water seal drain	6	27
Hard cervical collar	5	28	Blood pressure monitor	28	6
Oxygen supply by pipeline	13	21	ECG machine	28	6
Oxygen cylinder	33	1	Ultrasonic nebulizer	13	20
Suction machine	31	3	IV cannula and IV infusion sets	29	5
Multipara monitor	16	18	Syringes and disposable needles	33	1
Simple/transport monitor	14	20	Broselow tape	1	31
Defibrillator	16	18	Protoscope	14	20
All types of forceps	14	19	Fluid Warmer	3	31
Transport ventilator	3	31	Dressing sets	23	11
AMBU bag	26	8	Personal protecting equipments	19	14
Suprapubic catheter	4	30	Central line of all sizes	2	31
Light source	19	15	Capnography	1	32
Stethoscopoe	31	2	Infusion pump and syringe drivers	7	30
Oropharyngeal airway blades	20	14	Spine board with sling & scotch tape all sizes	4	30
LMA (Laryngeal Mask Airway)	2	31	Splints for all fractures	5	29
Tourniquet	16	18	Non-invasive and invasive ventilators	2	32
Pelvic binder & bedsheets with clips	4	30	Incubators	1	33
Needle holder and suture material	24	9	Emergency Cricothyroidotomy kit	1	33

Vaginal Speculum	11	22	**Emergency Thoracotomy set**	1	33
Ryles tubes	21	13	**Emergency Decompressive craniotomy sets**	0	34
Foley's catheter	21	13	**Emergency Thrombectomy sets**	0	34
Laryngoscope	22	12	**Phototherapy unit**	2	32

**n-number of hospitals, AMBU- Artificial Manual Breathing Unit, ECG- Electrocardiography, IV- Intravenous, ED-Emergency Department*

All hospital emergency departments should ensure 100% availability of all these equipments:

1. Airway equipments:
   - Laryngeal Mask Airway (6%)
   - Endotracheal tubes (62%)
   - AMBU bag (76%)
   - Transport ventilator (9%)
   - Laryngoscope (65%)
   - Oropharyngeal airway blades (59%)
   - Capnography (3%)
   - Emergency Cricothyroidotomy kit (3%)
   - Peak Expiratory Flow (9%)
2. Breathing equipments:
   - Emergency Thoracotomy set (3%)
   - Chest tube with seal drain (18%)
   - Ultrasonic nebulizer (38%)
   - Oxygen cylinder (97%)
   - Oxygen supply by pipeline (38%)
   - Suction machine (91%)
   - Non-invasive and invasive ventilator (6%)
3. Circulation equipments:
   - Multipara monitor (47%)
   - Transport monitor (41%)
   - Pelvic binder or bed-sheets with clips (12%)
   - Fluid warmer (9%)
   - Portable Ultrasound machine (18%)
   - Central line of all sizes (6%)
   - Infusion pumps and syringe driver (20%)
   - Defibrillator (47%)
4. General equipments:
   - Mobile bed for resuscitation (23%)
   - Crash cart (53%)
   - ED blood storage (18%)
   - Hard cervical collar (15%)
   - Spine board with slings (12%)
5. Pediatric equipments:
   - Broselow tape (3%)
   - Phototherapy Unit (6%)
   - Incubators (3%)

Suggestions:

1. All essential equipments and supplies should be present in every hospital to improve the quality of care
2. There should be dedicated staff for maintenance of equipments in emergency
3. There should be dedicated training of staff regarding the maintenance of equipments (how to use and maintain)

4. Maintain checklist of supplies and equipments, they should be checked before end of every shift and beginning of every shift
5. Maintain a checklist of non-functional equipments and consumed supplies and should be communicated during handovers

23. POINT OF CARE LAB

Point of care lab for ED was observed in only 2 hospitals out of all 34 district hospitals. It was observed that in ~40-60% hospitals performed hemogram, random blood sugar, electrolytes, blood urea & serum creatinine, urinary ketones, pregnancy test for ED, while the rest of the tests were performed only in few hospitals ED.

Point of care lab for hospitals did not perform the entire listed test of annexure-4 of study tool. D-dimer, Pro-BNP, plasma ketones, toxicology screening-urinary, serum osomlality, urine osmolality, TEG and PEF also do not performed by most of the hospitals as shown in table 32.

Table 32: Overall Summary of Point of Care Lab for ED & Hospital Lab at District Hospitals (n = 34)

List of tests/investigations	Point of care lab in ED		Hospital lab	
	Yes	No	Yes	No
Hemogram- Hb, Hct, TLC, DLC, Platelet	15	14	32	0
Random blood Sugar	22	8	29	3
Coagulation profile: PT, APTT, INR	9	20	19	13
Electrolytes: Na, K, Cl,Ca	12	17	27	6
Blood Urea & Serum Creatinine	12	16	30	2
Blood Gas Analysis	5	24	7	25
Cardiac enzymes, Trop-I, Trop-T	8	21	13	19
Serum Amylase	5	23	14	17
D-Dimer	1	27	2	29
Pro-BNP	1	27	2	29
Urinary ketones	13	17	24	8
Plasma Ketones	0	28	4	27
Toxicology Screening-Urinary	0	28	2	29
Serum Osmolality	1	27	3	28
Urine Osmolality	0	28	6	25
Pregnancy test	18	11	30	2
Thromboelastogram (TEG)	0	27	1	29
Peak Expiratory Flowmeter	0	28	3	28
Microscopy: Thin & Thick Smear	12	17	28	7
Rapid Diagnostic Test (Malaria)	12	17	29	3
CSF: Microscopy & Gram staining	3	25	11	20

Portable USG	1	27	6	25
Echocardiography	4	25	7	23
Portable X ray	7	21	10	21
CT Scan	8	18	11	18

**n-number of hospitals, ED-Emergency Department, Hb- Hemoglobin, Hct- Hematocrit, TLC- Total Leukocyte Count, DLC- Differential Leukocyte Count, PT- Prothrombin Time, APTT- Activated partial thromboplastin time, INR- International Normalized Ratio, BNP- Brain Natriuretic Peptide, USG- Ultrasonography, CT- Computerized Tomography*

24. ESSENTIAL MEDICINES FOR EMERGENCY

It was observed that none of the district hospitals had all essential medicines required for emergency out of all 34 district hospitals.

Most of the district hospitals did not have essential drugs used for emergency. The checklist contains 101 essential medicines required in emergency department. Out of these 101 medicines, 30 medicines are categorized as resuscitation medicines (medicines used in resuscitation).

We had calculated the percentages of all essential equipment and medicines. The availability of essential medicines was calculated on three different scales: 50% or less (Score-0), 50% to 99% (Score-1), and 100% (Score-2).

For resuscitation medicines, the scoring was based on two scales: the score was zero if even one drug was missing from list (Score 0) and the score was two if all 30 medicines were present (Score-2). Resuscitation drugs should be must in all hospitals.

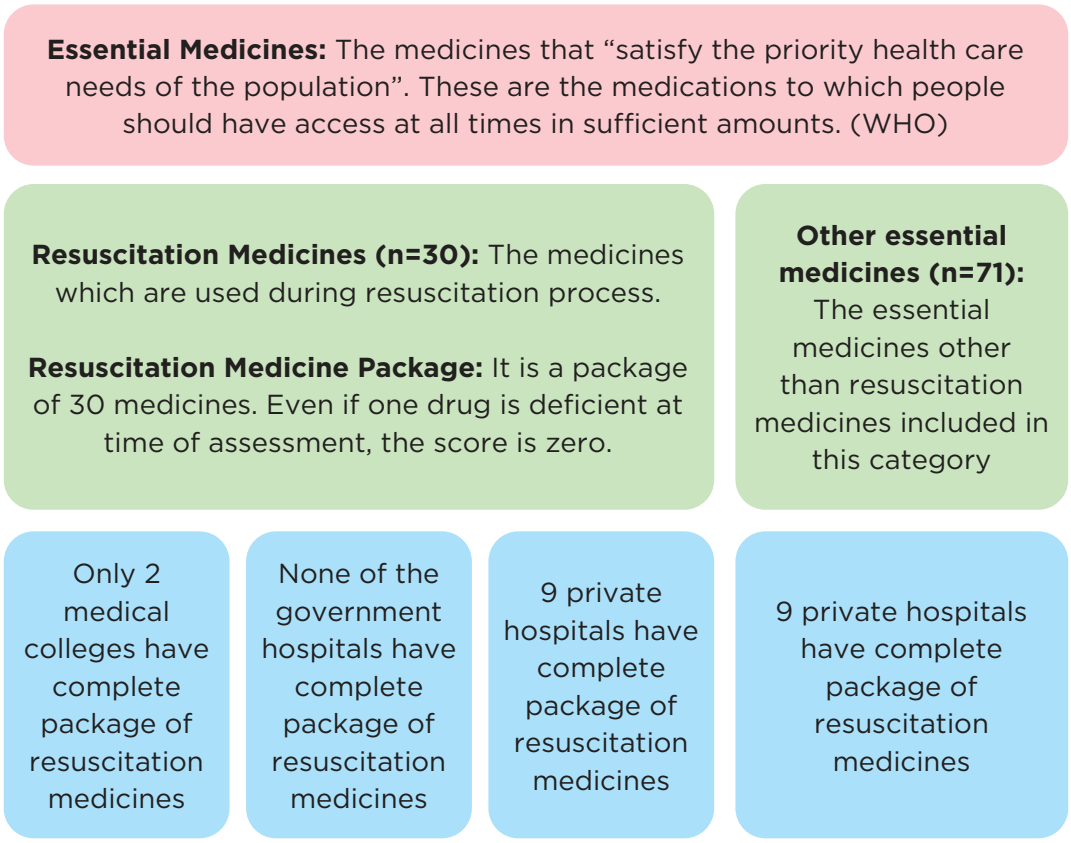


Figure 28: *Chart of Essential medicines for District Hospitals (n = 34)*

It was observed from table 33 that none of the district hospital had resuscitation drugs package as well as other essential drugs were also not fully compliant in district hospitals. The total score of all district hospitals was calculated 0 (Zero) because none of the hospital has resuscitation drugs package. Resuscitation drugs should be must in all hospitals.

Table 33: Overall Summary of Essential Medicines for Emergency in District Hospitals

S. No.	Name of Hospital	Standard	Maximum Score	Score Obtained	Compliance to each Standard in %	Total Score N(%)
1	Jamanabai General Hospital	Resuscitation Drugs	60	38	63%	0 (71.5%)
		Other Essential Drugs	142	114	80%	
2	Gomti District Hospital	Resuscitation Drugs	60	35	58%	0 (61.5%)
		Other Essential Drugs	142	93	65%	
3	Civil Hospital, Shillong	Resuscitation Drugs	60	8	13%	0 (25.5%)
		Other Essential Drugs	142	54	38%	
4	District Hospital, Peren, Nagaland	Resuscitation Drugs	60	1	2%	0 (16.5%)
		Other Essential Drugs	142	44	31%	
5	Jallianwala Bagh Matyr Memorial Hospital, Amritsar	Resuscitation Drugs	60	32	53%	0 (53.5%)
		Other Essential Drugs	142	76	54%	
6	Civil Hospital, Aizawl, Mizoram	Resuscitation Drugs	60	35	58%	0 (62%)
		Other Essential Drugs	142	94	66%	
7	District Hospital, Pasighat	Resuscitation Drugs	60	32	53%	0 (55.5%)
		Other Essential Drugs	142	83	58%	
8	District Hospital, Baramulla, Jammu & Kashmir	Resuscitation Drugs	60	45	75%	0 (74%)
		Other Essential Drugs	142	104	73%	
9	District Hospital, Ganderbal	Resuscitation Drugs	60	49	82%	0 (82.5%)
		Other Essential Drugs	142	118	83%	
10	District Hospital, Bishnupur, Manipur	Resuscitation Drugs	60	26	43%	0 (50%)
		Other Essential Drugs	142	81	57%	
11	Morigaon Civil Hospital, Assam	Resuscitation Drugs	60	28	47%	0 (63%)
		Other Essential Drugs	142	112	79%	

12	**Government Hospital Virajpet**	Resuscitation Drugs	60	38	63%	**0 (69.5%)**
		Other Essential Drugs	142	108	76%	
13	**District Hospital, Singtam**	Resuscitation Drugs	60	36	60%	**0 (65.5%)**
		Other Essential Drugs	142	101	71%	
14	**District Hospital, Karim Nagar**	Resuscitation Drugs	60	31	52%	**0 (56.5%)**
		Other Essential Drugs	142	86	61%	
15	**District Hospital, King Koti**	Resuscitation Drugs	60	30	50%	**0 (57%)**
		Other Essential Drugs	142	91	64%	
16	**Government District Hospital, Tenali**	Resuscitation Drugs	60	48	80%	**0 (80%)**
		Other Essential Drugs	142	113	80%	
17	**Govt. BDM Hospital, Kotputli**	Resuscitation Drugs	60	15	25%	**0 (28.5%)**
		Other Essential Drugs	142	46	32%	
18	**Hari Baksh Kanwatia Hospital**	Resuscitation Drugs	60	34	57%	**0 (67%)**
		Other Essential Drugs	142	109	77%	
19	**North Goa District Hospital**	Resuscitation Drugs	60	51	85%	**0 (83.5%)**
		Other Essential Drugs	142	116	82%	
20	**Dr Shyam Prasad Mukharji Civil Hospital, Lucknow**	Resuscitation Drugs	60	40	67%	**0 (78%)**
		Other Essential Drugs	142	126	89%	
21	**Government Multispeciality Hospital, Sector 16**	Resuscitation Drugs	60	36	60%	**0 (60.5%)**
		Other Essential Drugs	142	87	61%	
22	**Civil Hospital, Sector 22**	Resuscitation Drugs	60	22	37%	**0 (49%)**
		Other Essential Drugs	142	86	61%	
23	**Jai Prakash Narayan District Hospital, Bhopal**	Resuscitation Drugs	60	50	83%	**0 (87.5%)**
		Other Essential Drugs	142	130	92%	
24	**Southern Railways Hospital, Chennai**	Resuscitation Drugs	60	34	57%	**0 (69.5%)**
		Other Essential Drugs	142	116	82%	

25	**Puri District Headquarter Hospital, Orissa**	Resuscitation Drugs	60	33	55%	**0 (55%)**
		Other Essential Drugs	142	78	55%	
26	**Indira Gandhi Government General Hospital, Pondicherry**	Resuscitation Drugs	60	52	87%	**0 (88%)**
		Other Essential Drugs	142	126	89%	
27	**Sadar Hospital, Gaya**	Resuscitation Drugs	60	21	35%	**0 (39.5%)**
		Other Essential Drugs	142	63	44%	
28	**District Hospital, Peroorkada**	Resuscitation Drugs	60	28	47%	**0 (53%)**
		Other Essential Drugs	142	84	59%	
29	**General Hospital, Neyyatinkara**	Resuscitation Drugs	60	31	52%	**0 (65.5%)**
		Other Essential Drugs	142	112	79%	
30	**District Hospital, Dhamtari**	Resuscitation Drugs	60	36	60%	**0 (60%)**
		Other Essential Drugs	142	85	60%	
31	**District Hospital, Raipur**	Resuscitation Drugs	60	36	60%	**0 (59%)**
		Other Essential Drugs	142	82	58%	
32	**HNB Base Hospital, Srinagar**	Resuscitation Drugs	60	46	77%	**0 (74%)**
		Other Essential Drugs	142	99	70%	
33	**Coronation Hospital, Dehradun**	Resuscitation Drugs	60	34	57%	**0 (68%)**
		Other Essential Drugs	142	112	79%	
34	**Deen Dayal Upadhyay Hospital, Himachal Pradesh**	Resuscitation Drugs	60	42	70%	**0 (78.5%)**
		Other Essential Drugs	142	124	87%	

Suggestions:

1. Complete package of resuscitation medicines should be present in all hospitals for 24*7
2. Other essential medicines should also be present in all hospitals for 24*7
3. During third party audits, if any essential drug is missing from the resuscitation package then the license of the hospital may be cancelled

II. LIVE OBSERVATION

1. DISPOSITION TIME

The time from entry of patient at emergency department to admission/transfer-out/discharge is disposition time.

Ideally for time sensitive conditions (STEMI, stroke, trauma, cardiac arrest), patients should be immediately seen after arrival in emergency department. For red triage, patient should be seen within 10 min; for yellow triage, patient should be seen within 30 min and for green triage, patient should be seen within 4 hours after arrival in emergency.

Ideal disposition time for red triage patients should be within 6 hours, for yellow triage patients should be within 12 hours.

Table 34: Summary of Disposition Time of Patients Visited in Emergency Department at District Hospitals (n = 34)

District Hospitals	Red triage patients	Yellow triage patients	Green triage patients
	Median [IQR] Min-Max	Median [IQR] Min-Max	Median [IQR] Min-Max
More than 300 Beds	29 [205] 5-1440	105 [495] 10-3060	60 [105] 1-720
Less than 300 Beds	30 [40] 5-60	60 [169] 8-360	25 [36] 5-900

**n-number of hospitals*

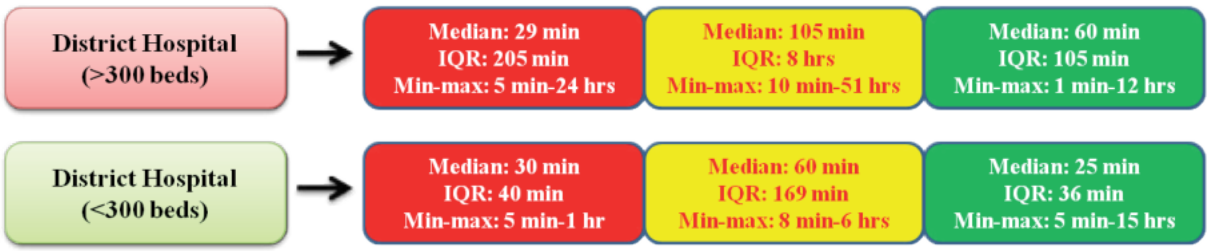


Figure 29: *Chart of Disposal time of patients in District Hospitals*

Suggestions:

1. It should be a sovereign department
2. Implementation of triage policy in all hospitals (Prioritization of patient)
3. Adequate manpower should be present in hospitals as per footfall of patients and emergency beds
4. Optimum utilization of resources
5. There should be a dedicated emergency nurse coordination (ENC) system

2. CHEST PAIN:

In this study, a total of 55 patients of chest pain were observed by our assessor's team from 34 district hospitals.

Percutaneous coronary intervention (PCI) is a non-surgical procedure used to treat narrowing (stenosis) of the coronary arteries of the heart found in coronary artery disease. PCI is also used in people after other forms of myocardial infarction or unstable angina where there is a high risk of further events.

The management of chest pain was not observed well in district hospitals. Firstly, 76% district hospitals did not have triage. Secondly, ECG was not performed within 10 min in 48% hospitals. Some hospitals didn't even have ECG machines. Thirdly, Door to needle was not performed in 89% hospitals within 30 minutes. Lastly, Door to PCI was totally absent in all district hospitals.

Table 35: Overall Summary of Chest Pain Management in District Hospitals N (%)

Key Performance Indicators of Chest Pain	District Hospitals >300 beds (n=15) (Pts=24)		District Hospitals <300 beds (n=19) (Pts=31)	
	Yes	No	Yes	No
Triage	6	18	7	24
Door to ECG (<10 min)	15	9	13	17
Door to Needle (<30 min)	3	12	1	20
Door to PCI (<90 min)	0	12	0	16

**n= number of hospitals, Pts=Number of red patients of chest pain, 24 patients were observed from district hospitals >300 beds; 31 patients were observed from district hospitals <300 beds*

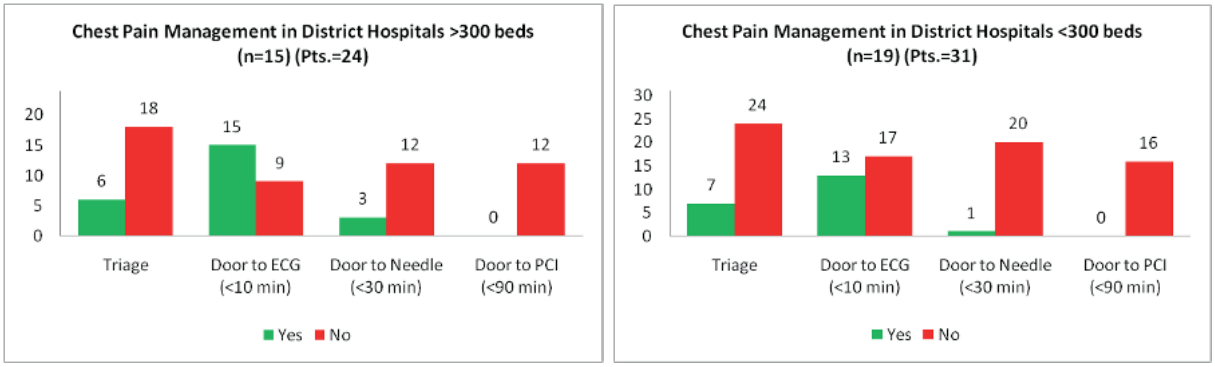


Figure 30: *Representation of Chest Pain Management in District Hospitals*

**n= number of hospitals, Pts=Number of red patients of chest pain, 24 patients were observed from district hospitals >300 beds; 31 patients were observed from district hospitals <300 beds*

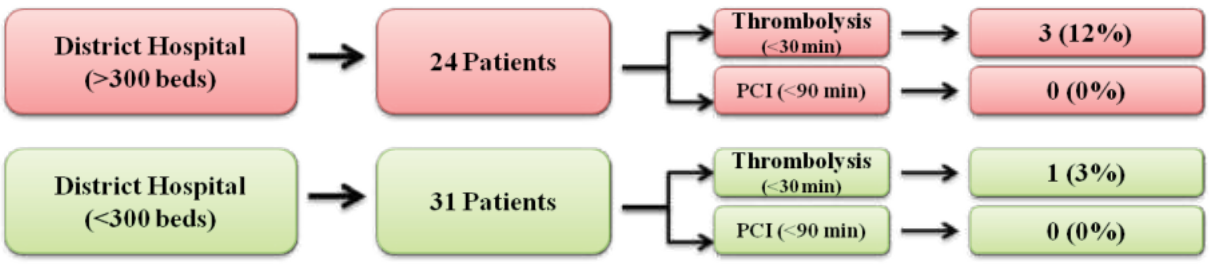


Figure 31: *Chart of Chest Pain Management of patients in District Hospitals*

Factors affecting Chest Pain Management:

1. Lack of manpower (such as ECG technician)
2. Lack of training
3. Lack of supplies (such as ECG machine)
4. Lack of infrastructure
5. Lack of policy

Suggestions:

1. Upgrade them for thrombolysis
2. Adequate trained emergency care provider
3. All district hospitals must have ECG machine and technician
4. Use Tele-ECG and Tele-Medicine programme
5. Resuscitate patient in district hospital and refer them to other higher government hospital
6. Develop a STEMI Programme by Hub and Spoke Model (figure 32)
7. Develop PCI centres in multi-speciality hospitals

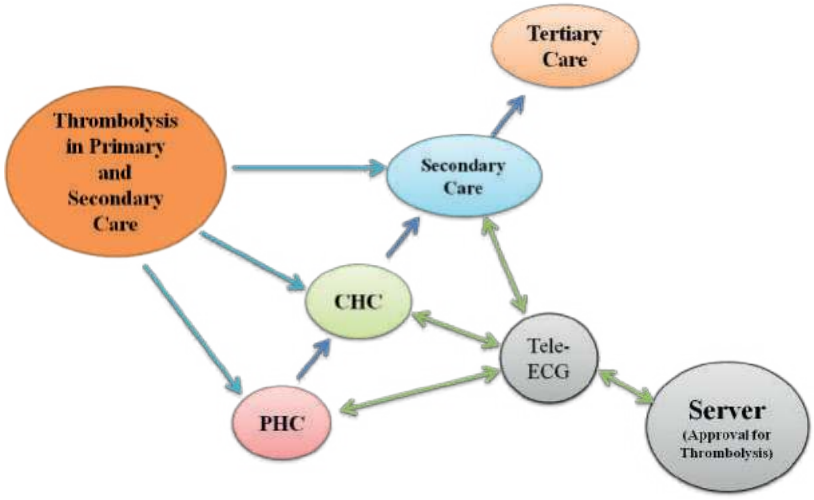


Figure 32: *Hub and Spoke model for Thrombolysis near home – STEMI*

Requirements for STEMI Hub and Spoke Model:

1. MOU (Memorandum of Understanding) with Local Government
2. Training
3. Supplies
4. Consent of patient
5. Governance
6. Budget Allocation
7. Cashless care in all hospitals for red triaged patients

Best practice in District Hospitals for Thrombolysis:

1. District Hospital, Baramulla, J&K
2. North Goa District Hospital, Goa
3. Jai Prakash Narayan District Hospital, Bhopal
4. Southern Railway Hospital, Madras

3. STROKE:

A stroke is a medical condition in which poor blood flow to the brain results in cell death. There are two main types of stroke: ischemic, due to lack of blood flow, and haemorrhagic, due to bleeding. Both result in parts of the brain not functioning properly.

The management of stroke was also not observed well in district hospitals due to lack of thrombolysis and CT scan machine.

Door to Doctor was achieved within 10 minutes in 73% hospitals. But Door to CT completion was performed within 25 minutes in 29% (for 6 patients only out of 22 patients of stroke). Door to thrombolytic was nearly absent in all hospitals as given in table 36 and figure 33.

Table 36: Overall Summary of Stroke Management in District Hospitals N (%)

Key Performance Indicators of Stroke	District Hospitals > 300 beds (n = 15) (Pts = 8)		District Hospitals < 300 beds (n = 19) (Pts = 14)	
	Yes	No	Yes	No
Door to Doctor (< 10 min)	7	1	9	5
Door to CT Completion (< 25 min)	5	3	1	12
Door to CT reading (< 45 min)	4	4	1	12
Door to Thrombolytic (< 60 min)	1	6	0	9
Door to First Pass (< 90 min)	1	5	1	9

**n = number of hospitals, Pts = Number of red patients of stroke, 8 patients were observed from district hospitals > 300 beds; 14 patients were observed from district hospitals < 300 beds*

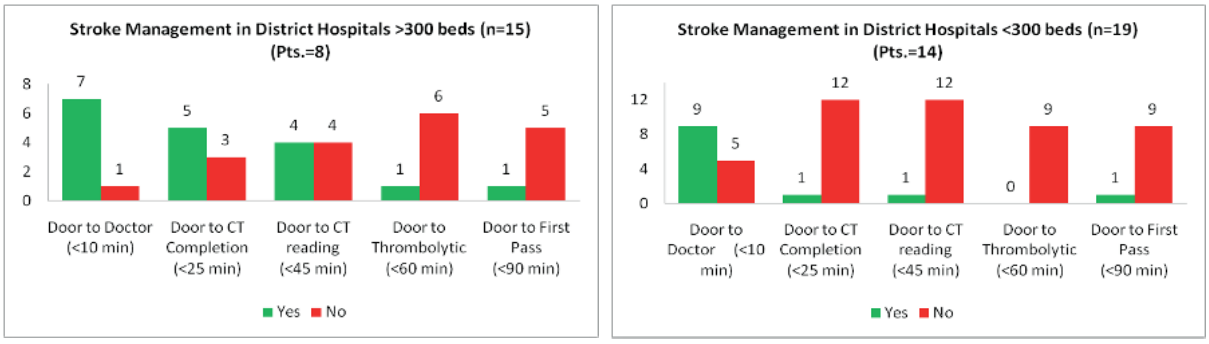


Figure 33: *Representation of Stroke Management in District Hospitals*

**n = number of hospitals, Pts = Number of red patients of stroke, 8 patients were observed from district hospitals > 300 beds; 14 patients were observed from district hospitals < 300 beds*

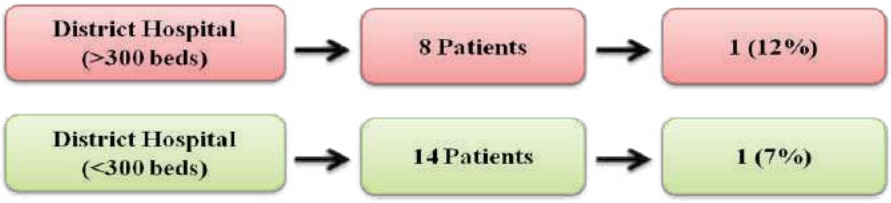


Figure 34: Chart of Stroke Management of patients in District Hospitals

Factors affecting Stroke Management:

1. Lack of manpower
2. Lack of training
3. Lack of supplies (such as CT Scan machine)
4. Lack of infrastructure
5. Lack of policy

Suggestions:

1. Thrombolysis near home – Hub and Spoke Model (figure 32)
2. Develop Tele-stroke programme
3. Stroke management by PPP (Public-Private Partnership) model in district hospitals

Best Practice for CT Scan in District Hospitals:

1. District Hospital, Tenali
2. Deen Dayal Upadhyay Hospital, Shimla
3. Morigaon Civil Hospital, Assam

4. TRAUMA

It was observed that trauma management is average in district hospitals. 18 patients resuscitate within 15 mins out of 38 trauma patients. Only 4 patients undergone CT scan due to lack of CT scan machine in district hospitals.

Table 37: Overall Summary of Trauma Management in District Hospitals N (%)

Key Performance Indicators of Trauma	District Hospitals >300 beds (n=15) (Pts=19)		District Hospitals <300 beds (n=19) (Pts=19)	
	Yes	No	Yes	No
Door to Resuscitation time (<15 min)	11	8	7	12
Door to CT Completion time in Head Injury (<45 min)	4	15	0	16
Disposal Time (in minutes)	97 mins		20 mins	

**n= number of hospitals, Pts=Number of red patients of trauma, 19 patients were observed from district hospitals >300 beds; 19 patients were observed from district hospitals <300 beds*

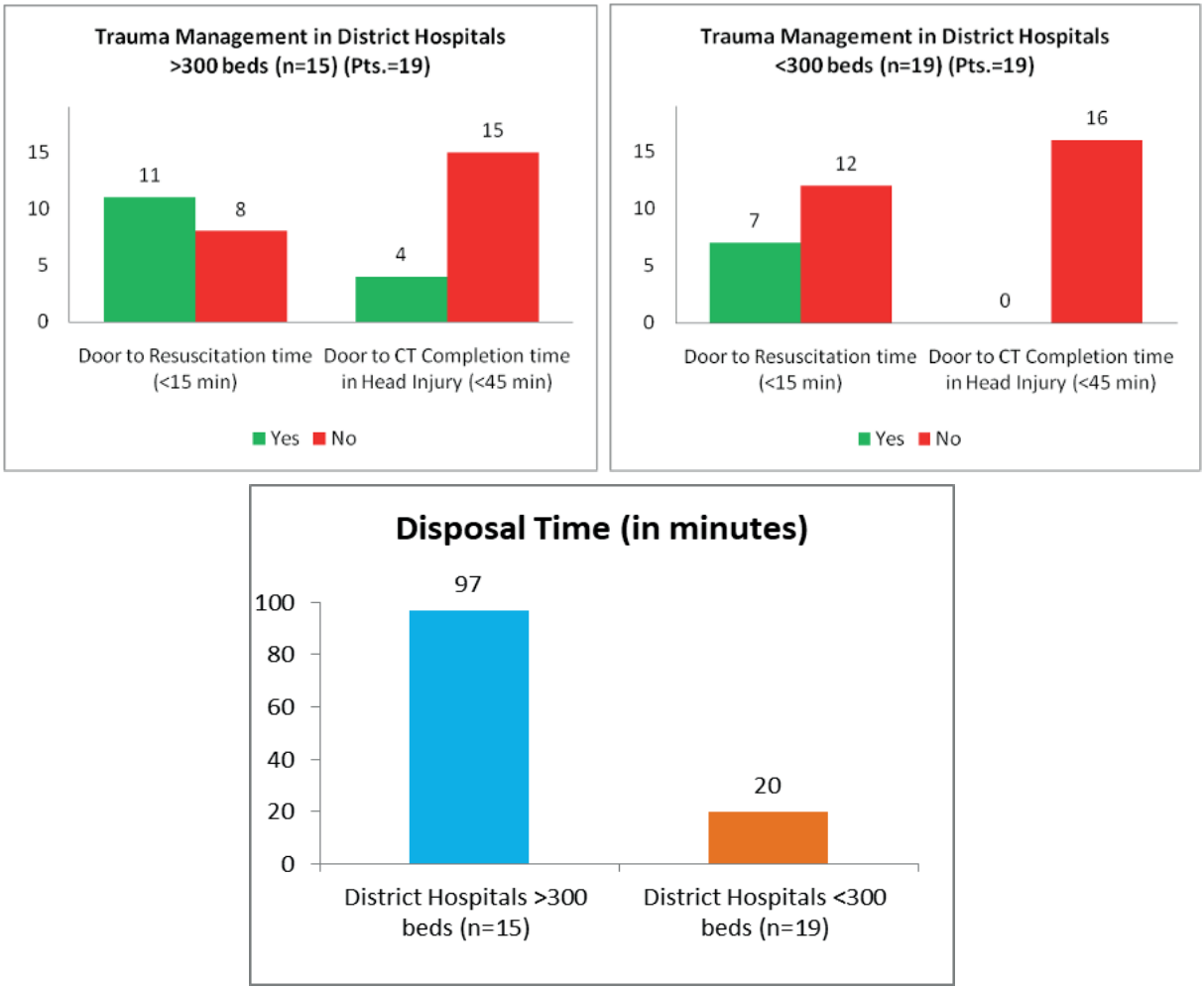


Figure 35: *Representation of Trauma Management in District Hospitals*

***n = number of hospitals, Pts = Number of red patients of trauma, 19 patients were observed from district hospitals > 300 beds; 19 patients were observed from district hospitals < 300 beds*

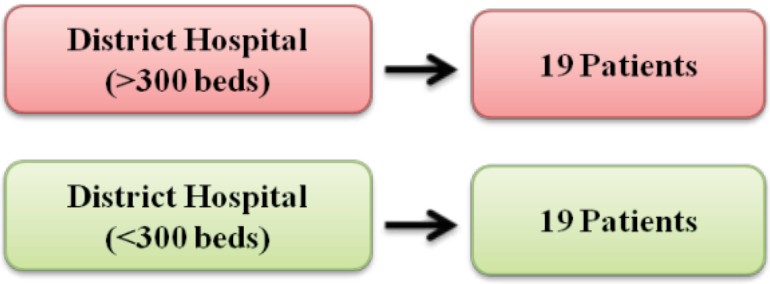


Figure 36: *Chart of Trauma Management of patients in District Hospitals*

Best Practice for CT Scan in District Hospitals:

1. District Hospital, Tenali
2. Deen Dayal Upadhyay Hospital, Shimla
3. HNB Base Hospital, Shimla

Factors affecting Trauma management:

1. Lack of staff
2. Lack of policy
3. Lack of training
4. Lack of resources (such as CT Scan machine)

Suggestions:

1. Adequate staff
2. Training
3. NABH Accreditation

5. INCIDENCE OF VIOLENCE:

During assessment, incidence of violence was observed in the hospital and assessors noted the observation in the given study tool. In the given table 38and figure 37, the ratio of incidence of violence is shown for district hospitals.

Table 38: Summary of incidence of Violence in District Hospitals

District Hospitals	Incidence of Violence	
	Yes	No
More than 300 beds	8	4
Less than 300 beds	8	9

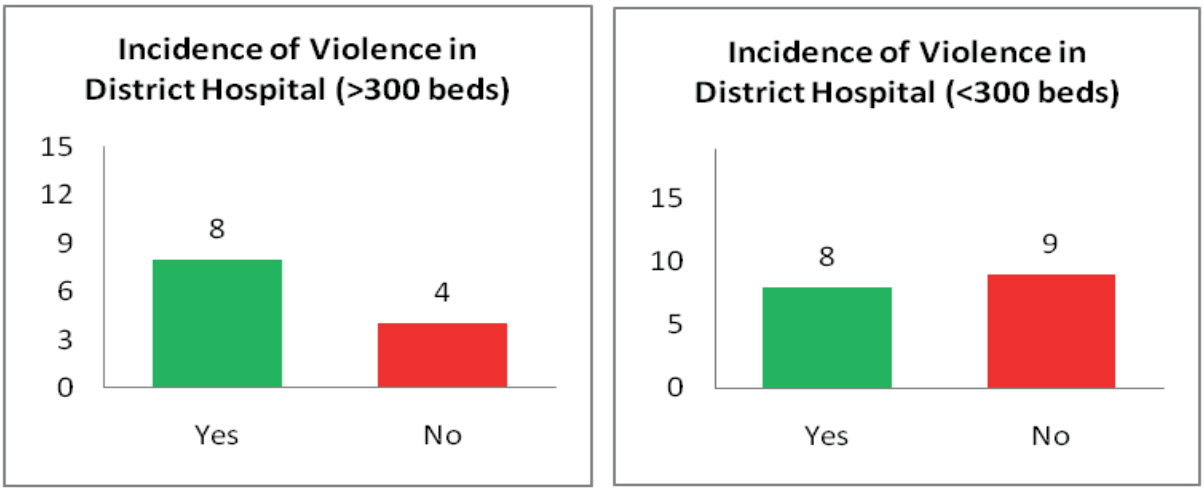


Figure 37: Representation of Incidence of Violence Observed in District Hospitals

5.1 Reason of Violence:

It was also observed during live observation about the reason of violence incident in hospitals. The reason of violence was either communication failure or care delay.

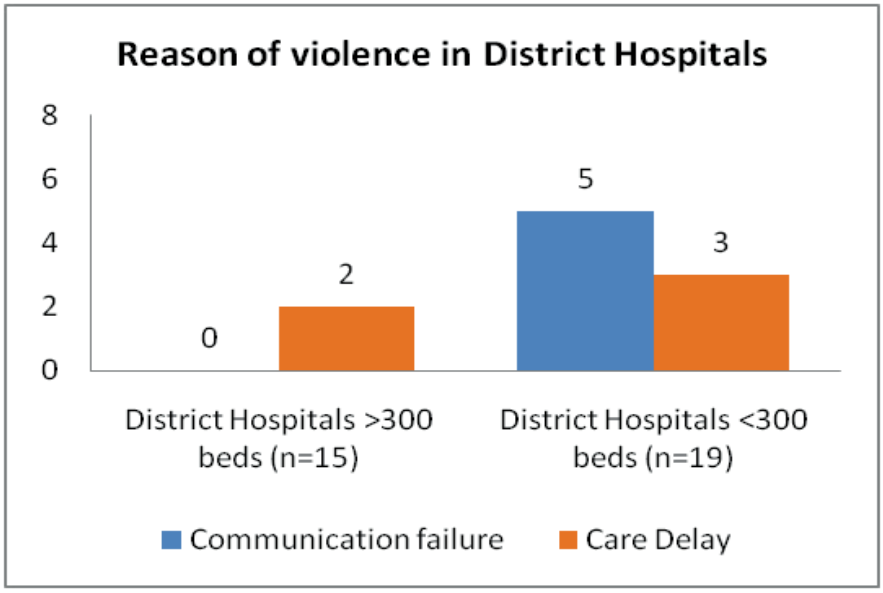


Figure 38: *Representation of the reason of Violence in District Hospitals*

5.2 Mitigation measures:

Mitigation measures were also recorded for district hospitals like availability of security guard in hospital, availability of police in hospital and availability of anti-violence mitigation policy.

Table 39: Summary of Mitigation measures available in District Hospitals

Mitigation Measures	District Hospitals >300 beds (n=15)		District Hospitals <300 beds (n=19)	
	Yes	No	Yes	No
Private Security Guard	5	6	10	6
Private Security Guard for 24*7	5	2	4	3
Police Available	7	4	7	8
Police Available Guard for 24*7	5	2	5	3
Anti-violence mitigation policy available	1	7	2	11

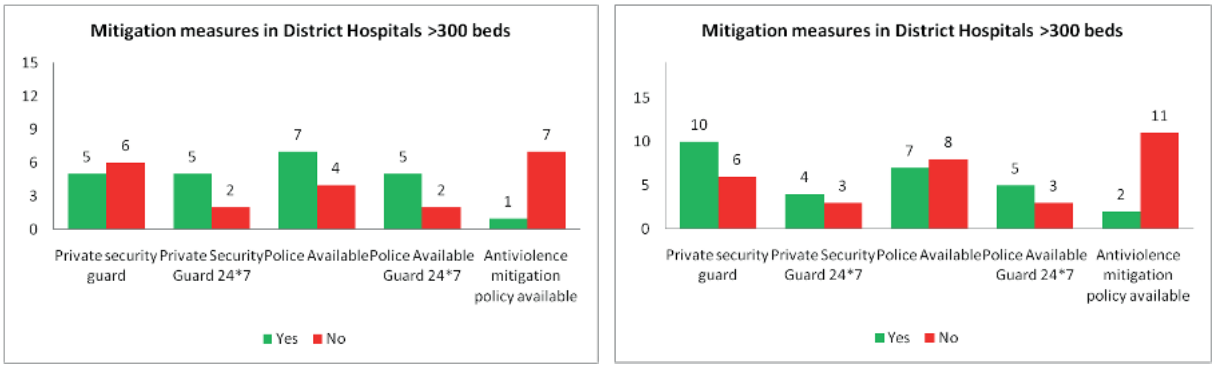


Figure 39: *Representation of Mitigation measures available in District Hospitals*

6. COMMUNICATION SKILLS IN EMERGENCY DEPARTMENT:

During/after treatment of any patient, the health care provider/staff/nurses communicate with the patient/patient attendant/relative and inform them about the condition of patient. It was observed that sometimes the health care provider/staff/nurses do not communicate properly with the patient/ patient attendant/relative.

For knowing the way of communication, assessor's team observed the communication between hospital staff and patient during live observation and the summary of communication is shown in table 40 and figure 40.

Table 40: Summary of Communication Skills in Emergency Department of District Hospitals

Communication Skills in ED	District Hospitals > 300 beds (n = 13)	District Hospitals < 300 beds (n = 16)
Full content with empathy and share decision making	6	7
Full content with empathy and no share decision making	3	6
Full content with no empathy	4	1
Minimal Communication and inappropriate behaviour	0	2

*n- number of hospitals

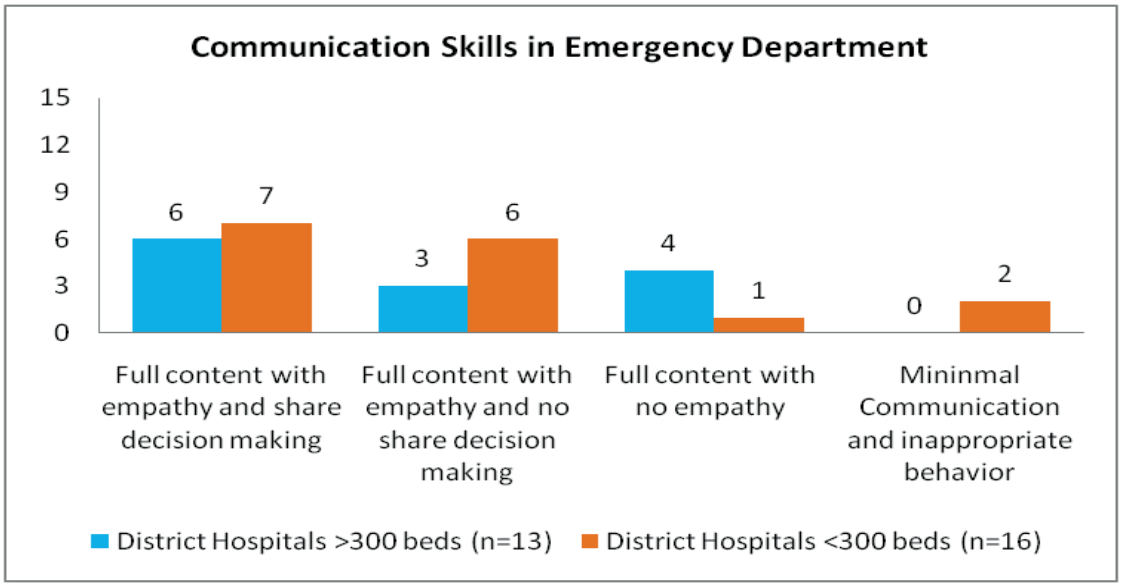


Figure 40: *Representation of Communication Skills in Emergency Department of District Hospitals*

Suggestions:

1. Create a cadre of emergency nurse coordinator (ENC) from the existing pool of nursing officers with defined roles and responsibility.
2. Training of staff on communication skills from under-graduate level (for doctors, nurses and paramedics).
3. Establish a concept of shared decision making.

7. PATIENT SATISFACTION:

During live observation by assessor's team for 24 hours, 3-5 random patients from each triage category (red, yellow and green) were asked few questions about the care (in terms of satisfaction) provided in the hospital.

Table 41: Summary of Triaged Patient Satisfaction for care provided in District Hospitals

Level of Satisfaction	District Hospitals >300 beds (n=15)			District Hospitals <300 beds (n=19)		
	Red Triaged	Yellow Triaged	Green triaged	Red Triaged	Yellow Triaged	Green triaged
Extremely satisfied	1 (11%)	0 (0%)	1 (10%)	0 (0%)	1 (8%)	4 (31%)
Very satisfied	1 (11%)	3 (27%)	4 (40%)	3 (25%)	4 (33%)	4 (31%)
Moderately satisfied	6 (67%)	7 (64%)	3 (30%)	5 (42%)	4 (33%)	3 (23%)
Slightly satisfied	1 (11%)	1 (9%)	2 (20%)	4 (33%)	3 (25%)	2 (15%)

**n- number of hospitals*

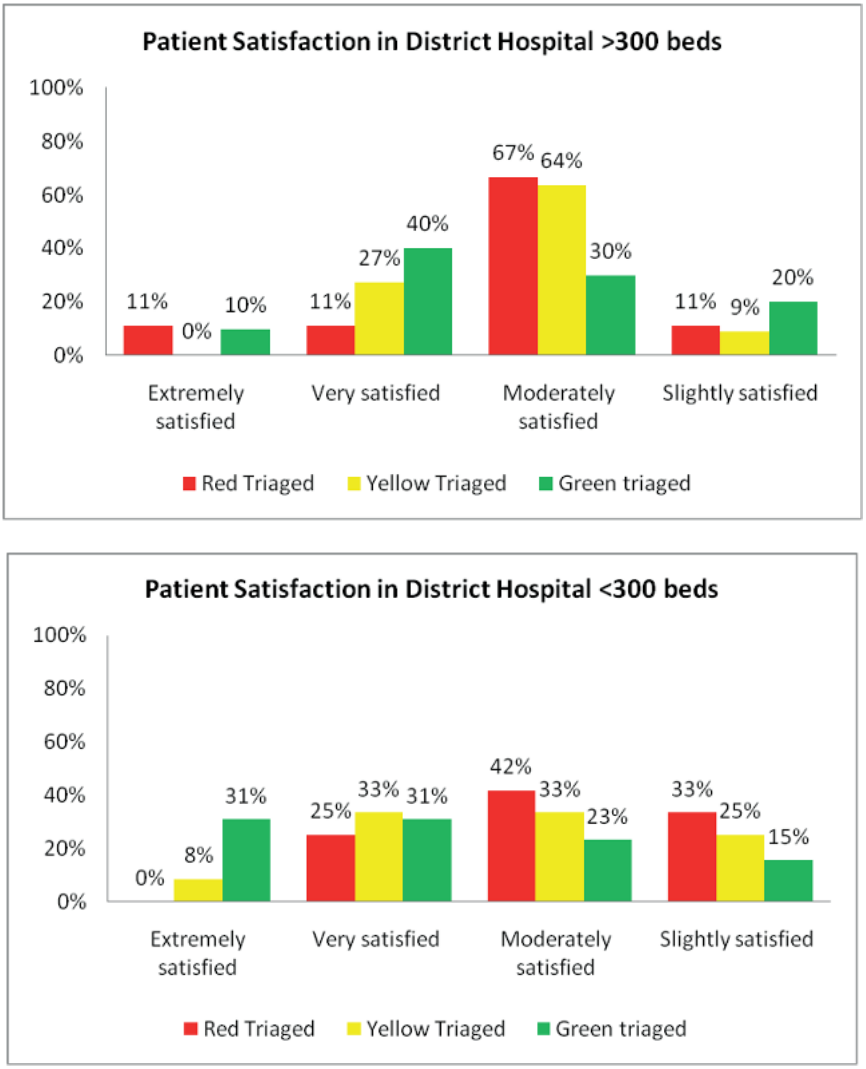


Figure 41: *Representation of Triaged Patient Satisfaction for care provided by District Hospitals*

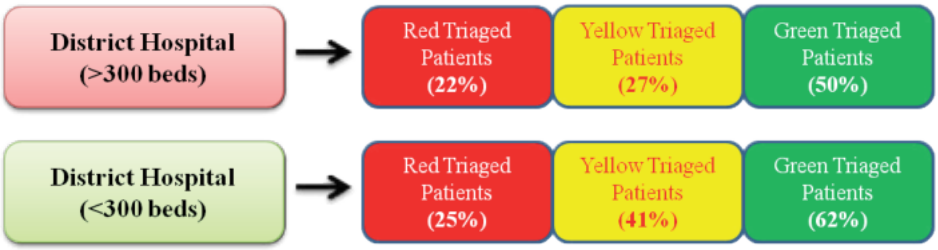


***Figure 42:** Chart of Patient Satisfaction in District Hospitals*

***Note:** Patient satisfaction was individually observed and calculated for red, yellow and green triaged patients. The percentage in brackets shows extremely satisfied and very satisfied patients/ patient attendant from the level of care provided by healthcare facility*

Suggestions

1. Establish a suggestion box in the hospital, especially within the emergency department premises.
2. Establish patient information display system.
3. Train emergency care providers on communication skills including grief counselling and shared decision making.

8. REFERRAL OF THE PATIENT:

During live observation, referral of patient was observed. Organization referral policy was checked. It was also observed that the hospital provides proper arrangement to the patient or not and the patient was assisted with any assistance or not from the hospital during referral.

Table 42: Summary of Referral of Patient from District Hospitals

Referral of Patient	District Hospitals >300 beds (n=15)		District Hospitals <300 beds (n=19)	
	Yes	No	Yes	No
Any referral policy	7	6	11	5
Any proper arrangement	7	6	9	7
Any assistance during referral	7	6	7	9

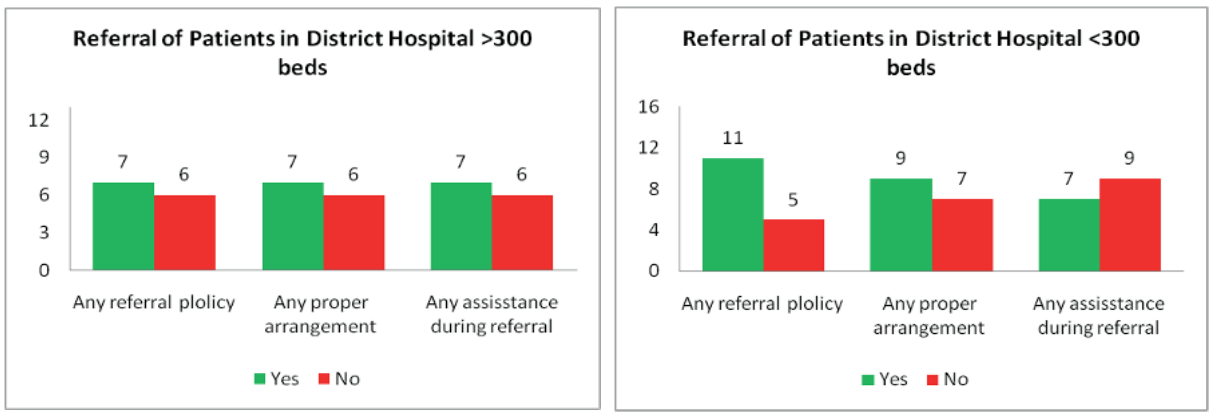


***Figure 43:** Graphically representation of Referral of Patient from District Hospitals*

Suggestions:

1. Develop National Forward and Backward Referral Policy with safe transport integrated with local EMS system
    a. Hub and Spoke Model (figure 75)
    b. Structured referral protocols
    c. There should be informed transfer.
2. NABH Accreditation

There should be a Standard Referral back policy (Standard Forward & Backward Policy) and it has to be in the form of hub and spoke model. In this policy, there should be a MOU of tertiary care centres with mid-level government hospitals with multi-speciality district hospitals as well as with private hospitals (cashless scheme).

In this policy, the referral should be on the basis of lack of facilities in secondary care. The tertiary care should mandate to admit all red triaged patients as well as yellow triaged patients.

In case of fully utilized tertiary care centres, they need to admit patients through emergency then they need to stabilize the patients and then they can transfer the stabilized yellow patient to other middle level government hospital for further care to cater the load.

The red triaged patients need to admit through emergency in tertiary care then after stabilization of patient transfer it either to ICU (who require ventilator) or HDU (who do not need ventilator). It will vacant the red triaged beds in emergency and be available for other patients.

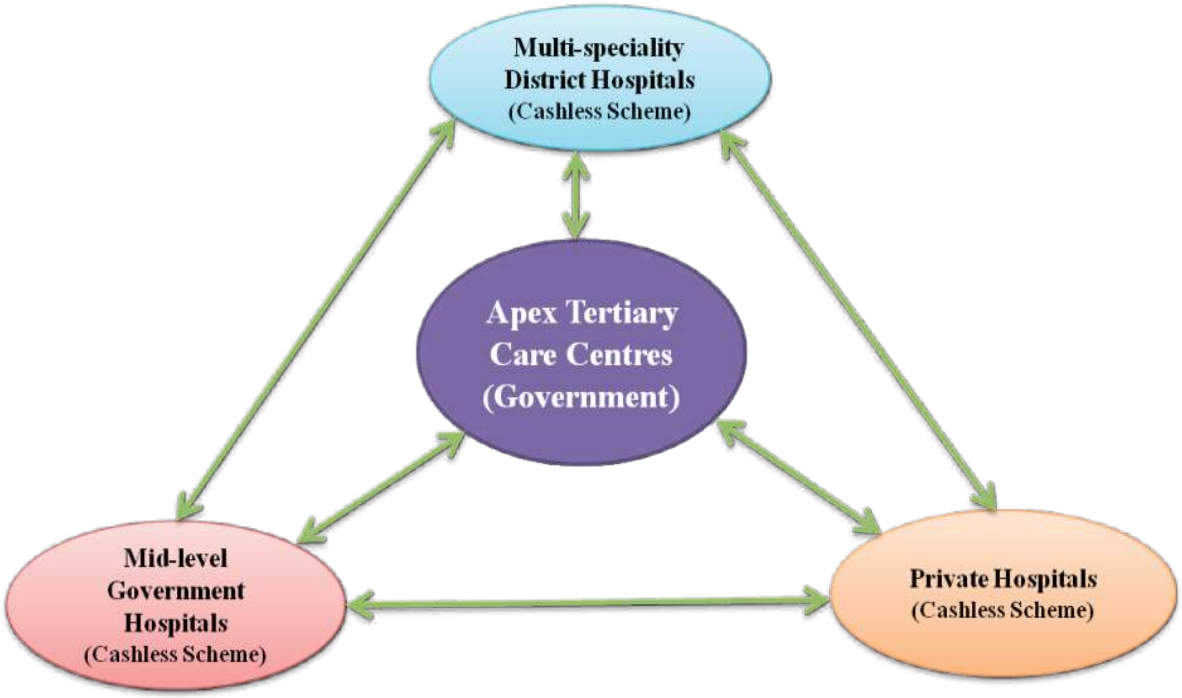


Figure 44: *Hub and Spoke Model for National Forward and Backward Referral Policy*

It is summarized in table 42 and figure 43 that 38% of district hospitals do not have any referral policy, 45% hospitals do not provide proper arrangement to patients and assistance was provided in only 48% hospitals during referral.

Requirements:

1. MOU with Government and EMS
2. There should be trade-off between tertiary and secondary care system for management of complex cases which are resource intensive in tertiary care with cases, which can be stabilized in secondary care centres.
3. Optimal utilization of all tiers of healthcare system based on capacity and capabilities.

III. LIVE OBSERVATION (ONE DAY DATA OF EMERGENCY)

1. BURDEN OF PATIENTS (OPD AND EMERGENCY):

One day data (24 hours data either of previous day or same day) was collected by assessor's team from registration desk of the hospital containing information regarding total visits of patients in hospital both OPD and emergency, admissions/transfer-out/discharge, death etc.

The burden of patients needing emergency came in 24 hours was 12% in district hospitals >300 beds and 10% in district hospitals <300 beds.

Table 43: Summary of Patients visited in OPD and Emergency of Assessed District Hospitals (ONE DAY)

District Hospitals	Emergency and Injury care Patients		OPD Patients		% of ED Patients out of all patients visited in hospital
	n	Median [IQR] Min-Max	n	Median [IQR] Min-Max	
More than 300 Beds	14	97 [88] 22-769	12	1024 [930] 54-5164	**12%**
Less than 300 Beds	14	95 [99] 15-960	10	810 [618] 40-2769	**10%**

**n: number of hospitals which shared data with assessor's team, IQR: Interquartile range*

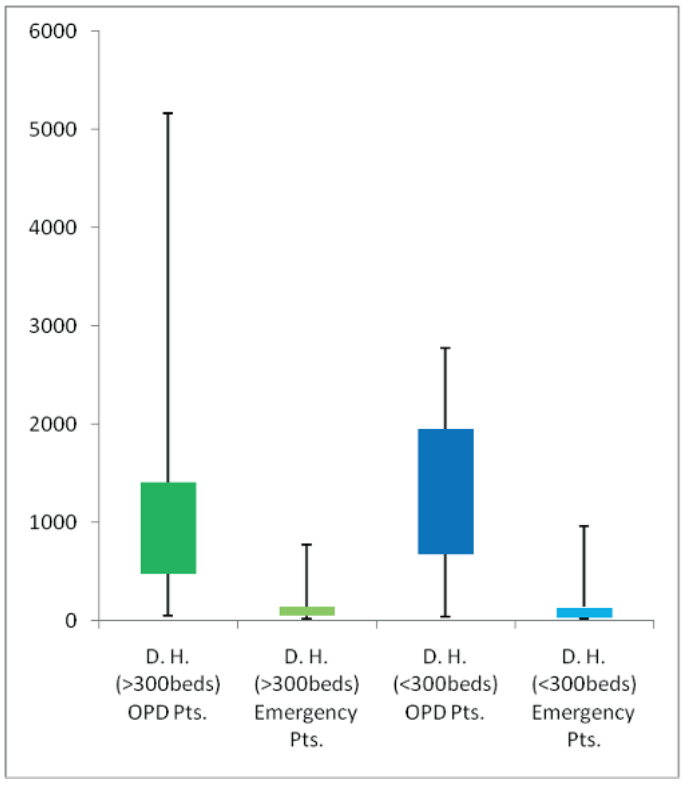


Figure 45: *Comparison of Patients visited in OPD and Emergency in District Hospitals (ONE DAY)*

**D.H.: District Hospitals, OPD: Out-patient Department, Pts.: Patients*

In district hospitals >300 beds, the burden of patients needing emergency for 24 hours as well as in OPD was maximum at Indira Gandhi Government General Hospital, Puducherry and minimum at District Hospital, Dhamtari.

In district hospitals <300 beds, the burden of patients in emergency was maximum at Puri District Headquarter Hospital and minimum at Jamanabai General Hospital.

2. SPECTRUM OF DISEASES

According to World Health Organization a state in which normal procedures are suspended and extra-ordinary measures are taken is termed as emergency condition.

The spectrum of diseases present at ED were assessed for adult (10 diseases) and pediatric patients (9 diseases) separately. Most of the hospitals maintained separate data for adult and pediatric, while others did not have pediatric patient data.

2.1 Adult Patients

In table 44, the summary of adult diseases reported at the emergency department for all district hospitals is depicted.

Table 44: Summary of Spectrum of Diseases for Adults in District Hospitals

Spectrum of Diseases	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=14)		
	N	Median [IQR] Min-Max	% Out of total ED visits	N	Median [IQR] Min-Max	% Out of total ED visits
Chest Pain	37	2 [3] 1-9	**3.4%**	52	5 [4] 2-15	**5%**
Stroke	5	1 [0] 1-2	**1%**	22	2 [3] 1-9	**4.1%**
Altered Mental Status	29	3 [2] 1-7	**2.3%**	20	3 [1] 1-5	**3.7%**
Trauma/Road traffic accident/injuries	123	5 [7] 1-45	**7.4%**	124	5 [6] 1-40	**10.3%**
Respiratory Distress	70	4 [5] 1-22	**5.2%**	58	5 [9] 1-17	**3.8%**
Pain in Abdomen	88	5 [6] 1-22	**6.2%**	149	13 [17] 1-27	**15.7%**
Poisoning	92	2 [1] 1-79	**2.5%**	6	1 [0] 1-3	**0.6%**
Snake Bite	12	6 [4] 2-10	**4.7%**	3	1 [0] 1-2	**0.7%**

Fever	132	8 [9] 1-25	**12.4%**	246	12 [16] 2-80	**16.3%**
Pregnancy related	32	5 [5] 2-10	**4.6%**	12	2 [0] 1-5	**2.3%**

**n: number of hospitals, N: total number of patients recorded in 24 hours from district hospitals, IQR: Interquartile range*

In district hospital >300 beds, the complaint of fever accounted for the maximum number of patients visiting in hospital emergency department followed by those with trauma patients.

In district hospitals <300 beds, the complaint of fever accounted for the maximum number of patients visiting in hospital emergency department followed by those with complaint of pain in abdomen.

2.2 Pediatric Patients

In table 45, the summary of pediatric diseases reported for all district hospitals is depicted.

Table 45: Summary of Spectrum of Diseases for Pediatrics in District Hospitals

Spectrum of Diseases	District Hospitals (>300 beds) (n=15)			District Hospitals (<300 beds) (n=14)		
	N	Median [IQR] Min-Max	% Out of total ED visits	N	Median [IQR] Min-Max	% Out of total ED visits
Respiratory Distress	21	3 [2] 1-11	**2.1%**	10	2 [0] 1-3	**0.8%**
Diarrheal Disease	22	3 [2] 1-6	**2.6%**	36	3 [1] 2-9	**3.4%**
Altered Mental Status	1	1 [0] 1-1	**0.7%**	1	1 [0] 1-1	**0.1%**
Trauma/Road traffic accident/injuries	9	1 [1] 1-4	**1.4%**	30	3 [3] 1-17	**3.1%**
Seizure	10	2 [1] 1-5	**2.6%**	5	2 [0] 1-2	**0.8%**
Pain in Abdomen	14	2 [1] 1-3	**1.9%**	19	3 [2] 1-5	**2.5%**
Poisoning	0	0	**0%**	0	0	**0%**
Snake Bite	0	0	**0%**	3	3 [0] 3-3	**2.3%**
Fever	35	3 [2] 1-7	**2.8%**	34	2 [2] 0-11	**2.1%**

**n: number of hospitals, N: total number of patients recorded in 24 hours from district hospitals, IQR: Interquartile range*

In district hospitals >300 beds, it was observed that the maximum number of patients visiting in hospital emergency accounted for complaint of fever followed by those with diarrheal diseases along with seizure patients.

In district hospitals <300 beds, it was observed that the maximum number of patients visiting in hospital emergency accounted for complaint of diarrheal diseases followed by those with trauma patients.

DISCUSSION 07

07

DISCUSSION

This study is the first cross-sectional stratified multi stage comprehensive assessment of emergency and trauma care facilities using consensus based study tool in India. We found significant gaps in whole system at various levels.

According to Medical Council of India, each hospital must have 5% emergency beds. It was observed that district hospitals have an average of 3%-5% emergency beds. On the other hand, the annual burden of patients visited in emergency is 16%, which is much more than the available emergency beds present in district hospitals.

A major concern was that only a few facilities had ED blood storage, protocols for massive blood transfusion and ED blood transfusion. A major gap in definitive care services was that nearly all district hospitals do not have general ICU and general OT.

Another major concern was lack of protocols/SOP/guidelines for emergency department. Majority of hospitals do not have emergency care protocols (alert system for time sensitive conditions) and most of the district hospitals do not have alarm bell/code announcement in ED.

The major gaps in disaster management in the healthcare facilities assessed were lack of separate decontamination area in ED, separate disaster stock in ED, absence of drill and debriefing for disaster management and the system for redistribution of patients to other network hospitals during disaster was present in few hospitals. The quality indicators for urgent and interventional procedures monitored were found missing from most of the hospitals.

Also, gaps were observed in data management system, most of the district hospitals do not have trauma registry system. Nearly all district hospitals do not have injury and ED surveillance system.

A major concern and gap in financing was observed in nearly all facilities from central government and also from state government. There are no protected funds for emergency and injury care including trauma from government.

We found significant gaps in the manpower, availability of essential medicines, equipments and supplies in district hospitals. A critical gap was the scarcity in manpower, essential medicines and equipments most crucial to emergency care such as cervical collar, transport ventilator, resuscitation medicines, etc. Many of the frequently absent equipment were inexpensive items,

which could save lives in many emergency conditions. None of the district hospitals have complete package of resuscitation drugs.

Additionally, we found major gaps in physical infrastructure present outside and inside emergency, which can be rectified by little financing and renovation of emergency and hospital premises so that we will be able to save lives in future due to these small things. This suggested, for example shift parking from in front of emergency to any side of the hospital, so that the ambulances and the other vehicles carrying patients will enter easily. Develop a proper ambulance drop zone, allocate adequate space for emergency, start triage policy in emergency, etc.

Lack of manpower was identified in most of the emergency department of district hospitals, while the hospital has sufficient and enough manpower in terms of doctors and nurses. This is suggested, rotate duties of specialist and super specialist residents from hospital to emergency department to save lives of patients in emergency department; it will help to increases manpower in emergency department.

Another major gap was observed for point of care lab for ED; most of the hospitals do not have separate 24*7 point of care lab for ED and life of several patients ruin because of lack of lab for ED. ED Patients have to wait for laboratory investigation results and examination and sometimes they die, if hospitals have separate lab for ED or hospital lab for 24 x 7 basis (ED test sample priority) then the results will come on priority basis.

There are several limitations to the study. First, most of the information of the healthcare facilities was obtained from the direct interviews with one or two administrative official per facility. The number of patients seen by live observation assessors was likely to be more accurate. Second, most of the facilities did not have data systems to capture the information and the data was based on an individual person's estimate in some cases.

CONCLUSIONS 08

08

CONCLUSIONS

Facility-level physical infrastructure, human resource, equipment & supplies, point of care lab and essential medicines gaps existed in the current emergency care system in district hospitals. Gaps in financing, protocols, blood bank, etc also existed in the current emergency care system in district hospitals.

Gaps also existed between pre-hospital care and definitive care services, proper linkage should be there. A major gap is lack of academic emergency medicine department at different healthcare facilities in India. All of these gaps were likely to compromise the provisions of quality emergency care.

These findings point towards the implementation of a comprehensive programme of emergency care system reforms in the country of India.

KEY SUGGESTIONS EMERGING FROM THE STUDY

09

KEY SUGGESTIONS EMERGING FROM THE STUDY

09

HEADING	SUGGESTIONS
Huge Mismatch between Emergency Beds & Burden of Emergency and Injury Cases	◆ We need to increase the emergency beds (12% emergency beds +10% buffer beds) **as per the existing and expected footfall.** ◆ Develop Cashless emergency care scheme for all red triaged patients because of out of pocket expenditure during emergency conditions ◆ To provide quality of care as per the existing and expected footfall we need to strengthen district hospitals by- 1. Upgrade them into medical college 2. Develop residency programme (DNB) 3. Initiate incentivization and decentivization according to the performance of hospital
Burden of Medico-legal Cases	◆ Develop dedicated EMO (Emergency Medical Officer) / Senior Resident (Forensic Medicine) to deal with MLC documentation and representation to court ◆ In-house or nearby police post for mitigating violence and protection of emergency care provider and for better co-ordination of MLC documentation and legal service
Hospital Blood Bank Services	◆ For running acute care services, we need blood bank services for 24*7 in all district hospitals. ◆ Emergency blood storage is mandatory for those district hospitals (>300 beds) which deals with more trauma cases

Hospital Definitive Care Services	District hospitals >300 beds should have ◆ trauma, non-trauma operative services, ◆ general ICU (Intensive Care Unit), ◆ HDU (High Dependency Unit), ◆ NICU (Neonatal ICU) and PICU (Pediatric ICU). District hospitals <300 beds should have ◆ general operative services, ◆ general ICU (Intensive Care Unit) / HDU (High Dependency Unit) and NICU (Neonatal ICU). District hospitals may be upgraded into multi-speciality hospitals to improve the quality of care
Hospital Ambulance Services	◆ The in-hospital ambulances should be optimally utilized in the common resource pool of EMS (Emergency medical Service) of the region as per requirement. ◆ Regular maintenance of ambulance should be done. ◆ The ALS ambulances can be used for mobile stroke unit as well as for STEMI programme. ◆ Creation of EMT (Emergency Medical Technician) course as a residency programme ◆ Dedicating job creation ◆ Paramedic Council
ED Protocols / SOP / Guidelines	◆ Development of academic residency programme ◆ Implementation of triage policy in each hospital ◆ NABH Accreditation
Disaster Management	◆ There should be standard protocols for implementation of in-hospital disaster management plan ◆ Implementation of hospitals prepared for disaster management for both external and internal ◆ Establish academic emergency medicine ◆ There should be separate decontamination area at entrance of emergency ◆ Every hospital should have surge capacity with separate disaster stock in emergency ◆ There should be drill and debriefing for disaster management ◆ Regular monitoring and evaluation of implementation of disaster management should be done from NDMA

Continuous Quality Improvement	◆ There should be dedicated quality manager for gap identification and loop closure ◆ Develop a quality council among emergency care providers ◆ Mandatory Emerald certification under NABH ◆ Regular mortality and morbidity meeting ◆ Regular third party audit of external agencies by using KPI and the funding of the hospital should be linked with it ◆ Continuous training of quality council provider as well as manager
Computerized Data Management System	◆ Develop National Emergency Department Information System (EDIS) ◆ Implement and integrate the computerized care delivery template which will serve as clinical notes, registry and surveillance ◆ It will use the data for quality improvement initiative and research ◆ Develop various emergency conditions registries such as cardiac arrest, poisoning, snake bite including trauma registry
Financing	◆ Protected funding for emergency and injury care services and for establishment of residency programme in emergency medicine, emergency nursing and EMT (Emergency Medical Technician) course ◆ Integration and aggregation of financial schemes for emergency and injury care ◆ Cashless scheme- Increase Ayushman Bharat scheme for all red-triaged patients in all hospitals to save out of pocket expenditure
Physical Infrastructure	◆ Uniformity of name (Emergency/Emergency Medicine Department) in every hospital for emergency / casualty / injury care etc. ◆ The capacity and capability of ED should be standardize based on the tier of facility, footfall of patients and academic programme ◆ Availability of either point of care lab or hospital lab (24*7) for emergency services ◆ Adequate space for ambulance drop zone ◆ There should be demarcated triage area ◆ There should be small ICU in each hospital
Manpower in Emergency Department	◆ Rotator posting of doctors and nursing students from different disciplines including interns for a defined period in emergency ◆ Creation of dedicated post for emergency department of doctors, nurses and paramedics ◆ NABH Accreditation ◆ Establish academic emergency medicine, emergency nursing and EMT

Equipments and Supplies in ED	◆ All essential equipments and supplies should be present in every hospital to improve the quality of care ◆ There should be dedicated staff for maintenance of equipments in emergency ◆ There should be dedicated training of staff regarding the maintenance of equipments (how to use and maintain) ◆ Maintain checklist of supplies and equipments, they should be checked before end of every shift and beginning of every shift ◆ Maintain a checklist of non-functional equipments and consumed supplies and should be communicated during handovers
Point of Care Lab	◆ All healthcare facilities should have either basic point of care lab or emergency lab in hospital for 24*7
Essential Medicines for Emergency	◆ Complete package of resuscitation medicines should be present in all hospitals for 24*7 ◆ Other essential medicines should also be present in all hospitals for 24*7
Entry to Admission/ Transfer-out/Discharge Time of Patients Visited in Emergency Department	◆ It should be a sovereign department ◆ Implementation of triage policy in all hospitals (Prioritization of patient) ◆ Adequate manpower should be present in hospitals as per footfall of patients and emergency beds ◆ Optimum utilization of resources ◆ There should be a dedicated emergency nurse coordination (ENC) system
Chest Pain Management	◆ Upgrade them for thrombolysis ◆ Adequate trained emergency care provider ◆ All district hospitals must have ECG machine and technician ◆ Use Tele-ECG and Tele-Medicine programme ◆ Resuscitate patient in district hospital and refer them to other higher government hospital ◆ Develop a STEMI Programme by Hub and Spoke Model ◆ Develop PCI centres in multi-speciality hospitals
Stroke Management	◆ Thrombolysis near home – Hub and Spoke Model ◆ Develop Tele-stroke programme ◆ Stroke management by PPP (Public-Private Partnership) model in district hospitals
Communication Skills in Emergency Department	◆ Dedicated emergency nurse coordinator (ENC) ◆ Training of staff on communication skills from under-graduate level (for doctors, nurses and paramedics)

Referral of the Patient	◆ Develop National Forward and Backward Referral Policy with safe transport integrated with local EMS system – Hub and Spoke Model – Structured referral protocols – There should be informed transfer ◆ NABH Accreditation
Burden of Death of Trauma Patients	Develop a robust integrated emergency care system which includes injuries
Burden of Brought Dead Patients	◆ Develop preventive emergency healthcare strategy such as National Injury Prevention Programme ◆ Developing a robust emergency injury care initiative  ◆ There should be installation of public access device of AED (Automated external Defibrillator) as a national policy in mass gathering areas such as schools, shopping mall, railway station, etc.

SUGGESTED KEY POLICY RECOMMENDATIONS

10

10

SUGGESTED KEY POLICY RECOMMENDATIONS

These findings were suggestive for the following suggestions:

1. **Develop a robust integrated emergency care system including injuries**
2. **Standardize the Protocols / SOP and Guidelines including Triage:** The policies, protocols and guidelines for emergency department should be standardized across all EDs irrespective of their status of being either single speciality/super speciality specific hospital. The most important is an emergency manual and its availability at the point of care. It should contain all SOPs and documented protocols for the disease management and policies of the organization for every situation. Most of the hospitals do not use triage system and hence compromises with the care of patient in emergency system. Triage should be strictly followed at each level of healthcare system to improve the current status of emergency care.
3. **Adequate Space allocation for Emergency and Injury Care:** Adequate space should be allotted for emergency in each hospital as per the footfall.
4. **Develop Standardize Emergency Department:** There is a need to develop a separate department of emergency medicine to deal with the current patient load in hospital emergency.
5. **Establish Academic Emergency Medicine, Emergency Nursing and Emergency Medical Technician:** The first program of academic emergency medicine was started in year 2009 in India, till now only 30 institutes have academic emergency medicine. It is a basic need in today's generation to have academic emergency medicine in those district hospitals which deals with high patient load in emergency.
6. **Continuous Training and Skill Development of ED Staff:** There should be capacity building of doctors, nurses and paramedics. The staff of emergency should be trained for life support courses e.g., ACLS, BLS, PALS, ATLS and Point of care ultrasound. This might take the form of 2-3 days BLS courses or regular 1-2 hours sessions addressing lifesaving skills at regular interval.

7. **Accreditation of all Emergency and the health facility for providing quality of care:** There should be accreditation of all EDs and health facility for delivering and improving the quality care. The accredited hospitals performed better than the non-accredited hospitals. There should be regular inspection and audits in EDs to enhance the performance of emergency care.
8. **Upgradation and maintenance of existed Emergency and Health facility:** The ED is like a mini hospital in itself requires separate wide variety of resources. The availability of resources should be supported with optimum utilization for maximum output. The management of staff for 24 hours in right number should be a policy and same should be followed for equipments and medicines. An effort should be made to integrate the EMS so that the patients should be shift earliest to the appropriate facility on basis of its capacity and manage the disease profile.
9. **Pooling of Ambulances (Integration and aggregation of ambulances):** The in-hospital ambulances should be optimally utilized in the common resource pool of EMS services of the region as per requirement.
10. **Optimization of Resources (manpower, infrastructure, supplies and medicines):** Optimization of resources needs less financing and will improve the current status of healthcare facilities.
11. **Protected Funding for Emergency and Injury Care as well as for developing academic department / DNB Emergency Medicine:** Separate fund will be required to strengthen the current status of emergency.
12. **Cashless care for all red triaged patients in all hospitals**

PHASE-I SUGGESTED KEY POLICY RECOMMENDATIONS

- Uniformity of name–Emergency or Emergency Medicine Department
- Initiate quality improvement programme
- Create a empowered hospital committee of different disciplines headed by in-charge/ MS and the member secretary–EMO
- Reorganization of the existing emergency department for managing patients for all tiers of healthcare facility based on the number of footfall of patients
- Implementation of triage policy
- Initiate data recording in each hospital
- Optimization of existing manpower, infrastructure and supplies
- Adequate dedicated emergency staff such as doctors, nurses and paramedics
- Training of doctors, nurses and paramedics for treating patients with time sensitive conditions
- Develop standardized care delivery template for time sensitive conditions
- Link pre-hospital care services with emergency care service and develop pre-hospital notification system
- Protected funding for supplies

REFERENCES 11

11

REFERENCES

1. World Health Organization. The world health report 2003: Shaping the Future. Geneva: WHO; 2003.
2. Chang CY, Abujaber S, Reynolds TA, Camargo CA, Obermeyer Z. Burden of emergency conditions and emergency care usage: new estimates from 40 countries. Emerg Med J EMJ. 2016 Nov; 33(11):794–800.
3. Strengthening Health Systems to Provide Emergency Care | DCP3 [Internet]. [Cited 2018 Aug 25]. Available from: http://dcp-3.org/chapter/2586/implications-urgent- care-needs-health-systems
4. WHO | Projections of mortality and burden of disease, 2004-2030 [Internet]. WHO. [Cited 2018 Aug 11]. Available from: http://www.who.int/healthinfo/global_burden_disease/projections2004/en/
5. WHO | Global status report on road safety 2015 [Internet]. WHO. [Cited 2018 Aug 20]. Available
6. from: http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/
7. Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016 in the Global Burden of Disease Study. India State-Level Disease Burden Initiative Collaborators, Lancet 2017; 390: 2437–60.Available from http://dx.doi.org/10.1016/S0140-6736 (17)32804-0
8. Subhan I, Jain A. Emergency care in India: The building blocks. Int J Emerg Med.2010; 3(4):207-211.
9. Ambulance service under national rural health mission. (Dec. 13, 2013.) Press Information Bureau, Government of India. Retrieved Dec. 29, 2016, from http://pib.nic.in/newsite/erelease.aspx?relid=101671.
10. Rajagopal D, Mohan R. (Oct. 31, 2015.) India's disproportionately tiny health budget: A national security concern? The Economic Times. Retrieved Dec. 30, 2016, from http://economictimes.indiatimes.com/articleshow/49603121.cms.

11. Road accidents in India, 2015. (May 23, 2016.) Government of India Ministry of Road Transport & Highways Transport Research Wing. Retrieved Dec. 29, 2016, from http://pibphoto.nic.in/documents/rlink/2016/jun/p20166905.pdf.

12. Trauma in India: Factfile. (n.d.) Indian Society for Trauma and Acute Care. Retrieved Dec. 29, 2016, from www.traumaindia.org/traumainindia.htm.

13. National Snakebite Management Protocol. (2009.) Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India. Retrieved Dec. 29, 2016, from http://164.100.130.11:8091/nationalsnakebitemanagementprotocol.pdf.

14. Strengthening Health Systems to Provide Emergency Care | DCP3 [Internet]. [cited 2018 Aug 25]. Available from: http://dcp-3.org/chapter/2586/implications-urgent- care-needs-health-systems

15. Altintas KH, Bilir N, Tuleylioglu M. 1999. Costing of an ambulance system in a developing country, Turkey: costs of Ankara Emergency Aid and Rescue Services' (EARS) ambulance system. European Journal of Emergency Medicine 1999; 6:355- 62.

16. Buntman AJ, Yeomans KA. The effect of air medical transport on survival after trauma in Johannesburg, South Africa. South African Medical Journal 2002; 92:807- 11.

17. Sethi D, Kwan I, Kelly AM, Roberts I, Bunn F. Advanced trauma life support training for ambulance crews. Issue 2. Oxford: Update Software; 2003 (Cochrane Review).

18. Husum H, Gilbert M, Wisborg T. Training pre-hospital trauma care in low-income countries: the 'Village University' experience. Medical Teacher 2003; 25:142-8.

19. Husum H, Gilbert M, Wisborg T, Van Heng Y, Murad M. Rural pre-hospital trauma systems improve trauma outcome in low-income countries: a prospective study from North Iraq and Cambodia. Journal of Trauma 2003; 54:1188-96.

20. Sethi D, Kwan I, Kelly AM, Roberts I, Bunn F. Advanced trauma life support training for ambulance crews. Issue 2. Oxford: Update Software; 2003 (Cochrane Review).

21. Black RS, Brocklehurst P. A systematic review of training in acute obstetric emergencies. International Journal of Gynaecology and Obstetrics 2003; 110:837-41.

22. Ali J, Adam R, Butler AK, Chang H, Howard M, Gonsalves D, et al. Trauma outcome improves following Advanced Trauma Life Support (ATLS) program in a developing country. Journal of Trauma 1993; 34:890-9.

23. Prevention of Maternal Mortality Network. Situation analysis of emergency obstetric care: examples from eleven operations research projects in West Africa. Social Science and Medicine 1995; 40:657-67.

24. Oyesola R, Shehu D, Ikeh AT, Maru I. Improving emergency obstetric care at a state referral hospital, Kebbi state, Nigeria. International Journal of Gynaecology and Obstetrics 1997;59 Suppl 2:S75-81

25. World Health Organization. Management of the child with a serious infection or severe malnutrition: guidelines for care at the first-referral level in developing countries. Geneva: WHO, Department of Child and Adolescent Health and Development; 2000.

26. Wilkinson DA, Skinner MW. Primary trauma care manual: a manual for trauma management in district and remote locations. Oxford: Primary Trauma Care Foundation; 2000

27. American Academy of Family Physicians CME Center. Advanced life support in obstetrics, 2000. Available from: http://www.aafp.org/also

28. Joshipura MK, Shah HS, Patel PR, Divatia PA, Desai PM. Trauma care systems in India. Injury 2003; 34:686-92

29. White Paper on Academic Emergency Medicine in India: INDO-US Joint Working Group (JWG): AK Das, SB Gupta, SR Joshi et al; JAPI: vol. 56: 789-797

30. Global Forum for Health Research. 10/90 report on health research 2002.Geneva: Global Forum for Health Research; 2002.

31. Waters H, Hyder AA, Phillips T. Economic evaluation of interventions for road traffic injuries – application to low middle income countries. Asia Pacific Journal of Public Health 2004;16:23-31

32. Macintyre K, Hotchkiss D. Referral revised: community financing schemes and emergency transport in rural Africa. Social Science and Medicine1999; 49:1473-87.

33. Ande B, Chiwuzie J, Akpala W, Oronsaye A, Okojie O, Okolocha C, *et al*. Improving obstetric care at the district hospital, Ekpoma, Nigeria. International Journal of Gynaecology and Obstetrics 1997; 59Suppl 2:S47-53.

34. Essien E, Ifenne D, Sabitu K, Musa A, Alti-Mu'azu M, Adidu V, *et al*. Community loan funds and transport services for obstetric emergencies in northern Nigeria. International Journal of Gynaecology and Obstetrics1997; 59Suppl 2:S237-44.

35. Shehu D, Ikeh AT, Kuna MJ. Mobilising transport for obstetric emergencies in north western Nigeria. International Journal of Gynaecology and Obstetrics1997;59 Suppl 2:S173-80.

ANNEXURES 12

12

ANNEXURE-I: LIST OF HOSPITALS

Zone	Sl. No	State	District Hospitals(>300 Bed Strength)	District Hospitals(<300 Bed Strength)
NORTH ZONE	1	**Jammu & Kashmir**	District Hospital Hospital, Barahmulla, Jammu & Kashmir	District Hospital Ganderbal
	2	**Himachal Pradesh**	District Hospital,Shimla	
	3	**Punjab**	Jallianwala Bagh Martyr's Memorial Civil Hospital, Rambagh, Amritsar	
	4	**Uttarakhand**	HNB Base Hospital	Coronation Hospital, Dehradun
	5	**Utttar Pradesh**	Civil Hospital- Lucknow	
	6	**Chandigarh**	Government Superspeciality Hospital, Sector-16	Civil Hospital Sector-22, Chandigarh
	7	**Rajasthan**	Hari Baksh Kanwatia Hospital, Shastri Nagar, Jaipur	Govt. BDM Hospital, Kotputli, Rajasthan
WEST ZONE	1	**Gujarat**		Jamanabai Government Hospital, Mandvi
	2	**Madhya Pradesh**	Jai Prakash District Hospital, Shivaji Nagar, Bhopal	
	3	**Chhattisgarh**	District Hospital, Dhamtari, Chhattisgarh	District Hospital, Tikarpara, Raipur, Chhattisgarh
	4	**Goa**		North Goa District Hospital, Mapusa
EAST ZONE	1	**Bihar**		Sadar Hospital, Gaya
	2	**Jharkhand**		
	3	**Orissa**		District Headquarter Hospital, Puri

NORTH EAST ZONE	1	**Sikkim**		Singtam District Hospital
	2	**Arunachal Pradesh**		BakinPertin General Hospital, Medog, Pasighat
	3	**Assam**		Morigaon Civil Hospital
	4	**Meghalaya**	Civil Hospital Shillong, Meghalaya	
	5	**Nagaland**		District Hospital, Peren
	6	**Manipur**		District Hospital, Bishnupur
	7	**Tripura**		Gomti District Hospital, Udaipur
	8	**Mizoram**		Civil Hospital, Aizawl
SOUTH ZONE	1	**Telangana**	District Hospital, Karim Nagar, Hyderabad	District Hospital, King Koti, Hyderguda, Hyderabad
	2	**Karnataka**		Government Hospital, Virajpet
	3	**Andhra Pradesh**	Government District Hospital, Tenali	
	4	**Kerala**	District Hospital, Neyyattinkara	District Hospital, Peroorkada
	5	**Tamil Nadu**	Madras Railway Hospital, Madras (Southern Railway Headquarters Hospital)	
	6	**Pondicherry**	Indira Gandhi Government General Hospital, Pondicherry	

ANNEXURE-II: STUDY TOOL

Section A: Background Information of the Hospital:

Date of Inspection:

<table>
<tr><td>1.</td><td>Name of the hospital:</td><td colspan="2"></td><td colspan="2" rowspan="3">Name of Inspection Team Member:
1.
2.
3.</td></tr>
<tr><td>2.</td><td>Address of the hospital:</td><td colspan="2"></td></tr>
<tr><td rowspan="2">3.</td><td rowspan="2">Type of Health Care Facility</td><td colspan="2">Government/Non Govt. (Trust/society/ Corporate/..... Specify)</td></tr>
<tr><td colspan="2">Large Tertiary(>500 Beds) / Secondary (300-500 Beds) / Secondary (100-300 Beds)</td></tr>
<tr><td>4.</td><td>Total no of Inpatient Beds in the hospital ☐</td><td colspan="2">Total no. of beds in Emergency care area</td><td colspan="2">Red (ESI:1-2) ☐
Yellow (ESI: 3-4) ☐
Green (ESI: 5) ☐</td></tr>
<tr><td>5.</td><td colspan="3">Total number of patients visited in hospital outpatient department (OPD) (During 1st Jan 2018 to 31st Dec 2018)</td><td>Adult ☐</td><td>Pediatric (Age - 0 to .....) ☐</td></tr>
<tr><td>6.</td><td colspan="3">Total number of patients visited in emergency (During 1st Jan 2018 to 31st Dec 2018)</td><td>Adult ☐</td><td>Pediatric (Age - 0 to .....) ☐</td></tr>
</table>

7.	Total number of death of trauma patients in emergency department (During 1st Jan 2018 to 31st Dec 2018)	Adult ☐	Pediatric (Age - 0 to .....) ☐
8.	Total number of patient's death due to road traffic injury in emergency department (During 1st Jan 2018 to 31st Dec 2018)	Adult ☐	Pediatric (Age - 0 to .....) ☐
9.	Total number of patients which are brought dead to the hospital (During 1st Jan 2018 to 31st Dec 2018)	Adult ☐	Pediatric (Age - 0 to .....) ☐
10.	Total number of Medicolegal cases attended in Emergency (During 1st Jan 2018 to 31st Dec 2018) ☐		
11.	Total Number of admissions through Emergency (last 1yr)	..... /Data Not Available	

Section-B: Hospital Services

1. BLOOD BANK(SCORE- 1: Full Compliance, 2: Partial Compliance, 3: Non Compliance)

S.No.	OBJECTIVE ELEMENTS	Check point	SCORE	REMARKS (If any)
1.	Does the facility have a licensed in-house blood bank?	Admin Interview/ Facility Visit	SCORE	
2.	If yes, does the blood bank available for 24x7?	Admin Interview/ Facility Visit	SCORE	
3.	If no, any tie up with external Blood bank facility?	Admin Interview/ Facility Visit	SCORE	
4.	Does the emergency have separate component facility: Packed cell (RBC), FFP, Platelet, Cryoprecipitate?	Admin Interview / Blood bank Visit/ Stock Register	SCORE	
5.	Does the facility have 0-Negative Blood availability?	Blood bank Visit/ Stock Register	SCORE	
6.	ED Blood storage	Facility available in ED	SCORE	
7.	ED Blood Transfusion Protocol	Written protocol	SCORE	
8.	Massive Blood Transfusion Protocol	Written protocol	SCORE	

Definitive Care Services (Score: 1-No, 2- Partial, 3- Yes)

**NOTE:* Question no 12 to 16 is not applicable for district hospital*

S. No.	OBJECTIVE ELEMENTS	Check point	SCORE	REMARKS (If Any)
1.	Emergency operative services for Trauma patients	Admin interview / 24 hours available facility/OT Register	SCORE	
2.	Emergency operative services for Non-Trauma (Surgical, Orthopedics etc.) patients	Admin interview / 24 hours available facility/OT Register	SCORE	
3.	Emergency operative services for Obstetrics patients	Admin interview / 24 hours available facility/OT Register	SCORE	
4.	Elective Operative services for Orthopedic patients	Admin interview / OT facility/OT Register	SCORE	
5.	Elective Operative services for neurosurgical patients	Admin interview / OT facility/OT Register	SCORE	
6.	Common Intensive care services (ICU)	Admin interview / facility/ Facility Register	SCORE	
7.	Common High dependency Unit (HDU)	Admin interview / facility/ Facility Register	SCORE	
8.	Pediatric ICU	Admin interview / facility/ Facility Register	SCORE	
9.	Neonatal ICU	Admin interview / facility/ Facility Register	SCORE	
10.	Neurosurgery ICU	Admin interview / facility/ Facility Register	SCORE	
11.	Cardiac Intensive care Unit	Admin interview / facility/ Facility Register	SCORE	
12.	Cardiac Cath lab*	Admin interview / facility/ Facility Register	SCORE	
13.	Intervention Radiology*	Admin interview / facility/ Facility Register	SCORE	
14.	Intervention Neuroradiology service with DSA*	Admin interview / facility/ Facility Register	SCORE	
15.	Facility for Emergency CABG services*	Admin interview / facility/ Facility Register	SCORE	
16.	Facility for Radiofrequency ablation services*	Admin interview / facility/ Facility Register	SCORE	

Hospital Ambulance Services(Score: 1-No, 2- Partial, 3- Yes)

SN.	OBJECTIVE ELEMENTS	Check point	SCORE	REMARKS (if any)
1.	Do you have ambulances in your hospital?	Admin interview / Facility/Ambulance visit	SCORE	
2.	If Yes, total number of ambulances.	Admin interview / Facility/Ambulance visit	NUMBERS	
3.	Total Number of Functional ambulances and Non-Functional ambulances.	Admin interview / Facility/Ambulance visit	Functional- Numbers Non-functional- Numbers	
4.	Number of BLS/ALS (Advance life support) ambulances.	Admin interview/ Ambulance visit	ALS- (Numbers only) BLS- (Numbers only)	
5.	For what purpose, hospital uses these ambulances?	Admin interview/ Ambulance driver	Pick up the patient/ Drop Patient / Intra-transfer of patient in hospital / Inter transfer of patient to other hospital	
6.	If hospital doesn't have any ambulance, then how you transfer patient from your hospital to other hospital?	Admin interview	COMMENT	
7.	Do you get Pre-Hospital Notification (Prior information about patient's condition is communicated to ED)?	Admin interview / Paramedic/Ambulance driver/Patient Interview	SCORE	
8.	Does the ambulance is manned with appropriately trained paramedics as per the level of ambulance services?	Admin interview / Paramedic Interview	SCORE	
9.	Do you have mobile stroke unit?	Admin interview / Mobile stroke unit visit	SCORE	
10.	a. Do you have Tele-Medicine facility? b. If no, did you start this facility in coming days? c. If Yes, how are you using it for patient care? d. Does it have minimum requirements?	Admin interview / Tele-stroke facility visit (whether the facility is mentoring the thrombolysis in at district hospital via tele technology platform)	a. YES/NO b. SCORE c. COMMENT d. sSCORE	

Section-C: Ed Protocol/Sop and Guidelines (Score: 1-No, 2- Partial, 3- Yes)

SN.	OBJECTIVE ELEMENTS	Check Point	SCORE	Remarks (If any)
1.	a. Do you have documented Emergency Manual at the point of care? b. If yes, only documented/ implemented? c. If implemented, off-on implemented/regular? d. If no, what is the protocol?	Protocol /SOP and procedures for emergency care are documented and operations in ED must be guided by them (e.g. Clinical Protocol/Treatment guidelines.)	SCORE SCORE SCORE	REMARKS
2.	a. Do you have documented triage guidelines and protocol? b. If no, how you manage patients in emergency department?	Triage protocol /SOP and procedures for emergency care are documented and operations in ED must be guided by them	SCORE	REMARKS
3.	a. Do you have documented policies and procedures which guide the transfer of patients into the organization? b. If yes, only documented/ implemented? c. If implemented, off-on implemented/ regular? d. If no, what is the protocol?	Outside patients are admitted only after proper referral by a doctor with prior communication depending on the services provided and bed availability.	SCORE SCORE SCORE	REMARKS
4.	a. Do you have documented policies and procedures which guide the transfer-out/ referral of stable and unstable patients after stabilization to another facility in appropriate manner with documentation? b. If yes, only documented/ implemented? c. If implemented, off-on implemented/ regular? d. If no, what is the protocol?	Documentation of referrals, advance communication, written orders by treating doctor and consent of the attendant/patient taken.	SCORE SCORE SCORE	d) REMARKS
5.	a. Do you give discharge summary to all patients? b. If no, which procedure you follow?	Discharge with regard to LAMA, DAMA, MLC, Abscond (Clearly mentions the treatment given, name of the treating doctor etc.)	SCORE	b) REMARKS

6.	a. Do you have policy on handling cases of death (outside and inside hospital) mentioned in manual? b. If no, how you manage death cases?	To make MLC, intimate police, dead body hand over etc.	SCORE	b) REMARKS
7.	a. Do you have documented disaster management plan? b. If no, which procedure you follow?		SCORE	b) REMARKS
8.	Is there a triage policy/system at your emergency department? If Yes then: a. Are you using triage? b. Is there a dedicated triage nurse? c. Is there a colour triage band available? d. Is there any regular audit of your triage system?	Verify written SOP & Interview	YES/ NO a) SCORE b) SCORE c) SCORE d) SCORE	
9.	Do you have alert system: code Blue?	Verify written SOP & Interview	SCORE	
10.	Do you have alert system: Trauma?	Verify written SOP & Interview	SCORE	
11.	Do you have alert system: Chest Pain?	Verify written SOP & Interview	SCORE	
12.	Do you have alert system: Sepsis?	Verify written SOP & Interview	SCORE	
13.	Do you have alert system: Stroke?	Verify written SOP & Interview	SCORE	

Section-D: Safety & Security (Score: 1-No, 2- Partial, 3- Yes)

S. No.	Objective Elements	Check Point	Score	Remarks (If Any)
1.	Do you have fire safety?	Admin interview/smoke detectors, fire extinguishers (class A, B , C or ABC type) Sign postings, Fire exits etc.	SCORE	
2.	Do you have building safety?	Admin Interview	SCORE	
3.	Do you have electrical safety?	Admin interview/UPS, Generators for monitors and ventilators etc.	SCORE	
4.	Do you have patient and provider safety?	Side rails, window grills, etc.	SCORE	
5.	Do you have chemical safety?	Regular sterilization, safety hazard specially PEP, Pre-exposure immunization such as swine flow, etc.	SCORE	

6.	a) Do you have periodic training of staff? (Every 6 months) b) Do you have periodic mock drill? (Every 6 months)	Admin interview/Response time measured and corrective measures taken (Record maintained)	SCORE	
5	Do you have police post available within the premises?	Admin interview/Facility visit	SCORE	
6	Do you have alarm bell in Emergency/ Code announcement available for extra help?	Admin interview/ Facility visit/Security system is in place in case of violence, mass situation in ED	SCORE	

Section-E: Disaster Management (Score: 1-No, 2- Partial, 3- Yes)

S. No.	Objective Elements	Check Point	Score	Remarks
1	Do you have disease outbreak management plan?	Admin interview/ See Plan document [e.g. for Dengue, malaria etc. and other community emergencies]	SCORE	
2	Do you have surge capacity in your hospital?	Admin interview/ Facility visit [Triage area is marked, expansion of care area, line of authority is clear, internal communication system]	SCORE	
3	Do you have separate decontamination area at ED entrance?	Admin interview/ Facility visit [Provision for flexible and expandable facility]	YES/NO	
4	Do you have separate disaster stock in ED? If yes, for how many patients (e.g. 50, 100)?	Admin interview/ Facility visit [Medical supplies, manpower, medicines etc.]	SCORE NUMBER	
5	Does drill is conducted and debriefing is done for disaster management?	Admin interview/ See Plan document [Role and responsibility of staff in disaster is checked and recorded]	SCORE	
6	Do you have system to redistribution of patients to other network hospitals during disaster?	Admin interview/ See Plan document [Prior plan for increased load of patients]	SCORE	

Section-F: Continuous Quality Improvement (Score: 1-No, 2- Partial, 3- Yes)

S.No.	Objective Elements	Check Point	Score	Remarks (If Any)
1.	Do you have dedicated staff for gap identification and loop closure?	Admin interview (Dedicated staff can be: Patient safety nurse, Infection control nurse, Emergency nurse coordinators, Quality manager)	SCORE	
2.	Do you have regular audits in your hospital?	Admin interview [Death audits and post event analysis etc./ Clinical audit]	SCORE	
3.	Do you have continuous education and training programs cycles for professional development and skill improvement?	Admin interview (Trainings like- ACLS, BLS, ATLS, etc.)	SCORE	
4.	Do you have key indicators of quality monitored?	Admin interview [Key Indicators are Mortality rate, Referral rate, Return to ER, LAMA, Absconding rate]	SCORE	
5.	Are quality indicators for urgent and interventional procedures monitored? (% of patients receiving interventions is documented, at-least 50%)	Admin interview [e.g. 1. MI- (Door to needle -30 mins thrombolysis, door to balloon time 90 mins PCI) 2. Stroke: (door to needle time 60 mins) 3. Trauma resuscitation (30 min of arrival)]	SCORE	
6.	Do you have death review committee?	Admin interview	SCORE	
7.	Do you have Central Empowered Hospital committee for continuous quality improvement of Emergency services?	Admin interview	SCORE	

Section-G: Data Management System (Score: 1-No, 2- Partial, 3- Yes)

S.No.	Objective Elements	Check Point	Score	Remarks (If Any)
1.	Do you have Integrated Computerized EHR (Registration, Clinical care, Lab, Radiology, Others and Disposal)?	Admin interview	SCORE	
2.	Do you have Computerized Patient Registration system?	Admin interview	SCORE	
3.	Do you have Computerized Patient clinical examination notes?	Admin interview	SCORE	
4.	Do you have Computerized Patients investigation Lab reports?	Admin interview	SCORE	
5.	Do you have Computerized Patients radiological investigation reports?	Admin interview	SCORE	
6.	Do you have Trauma registry?	Admin interview	SCORE	
7.	Do you have Injury Surveillance system?	Admin interview	SCORE	
8.	Do you have Emergency Department Surveillance system?	Admin interview	SCORE	
9.	Do you have data retrieval system for Quality Improvement & Research?	Admin interview	SCORE	

Section-H: Financing (Score: 1-No Funds, 2-Not Sufficient, 3-Sufficient)

Sn.	Objective Elements	Check Point	Score	Remarks
1.	Do you have Central Govt. funds for Emergency and Trauma services?	Admin interview	SCORE	
2.	Do you have dedicated State Govt. funds for Emergency and Trauma services?	Admin interview	SCORE	
3.	If funds are available, which health protection schemes are covering your emergency care system?	Admin interview	—	NAME THE SCHEME
4.	Full Utilization of funds (Annual utilization)?	Admin interview	SCORE	
5.	Is there any delay in release of funds?	Admin interview	SCORE	

ANNEXURE-1: PHYSICAL INFRASTRUCTURE

1. OUTSIDE EMERGENCY (SCORE: 1-NO, 2- PARTIAL, 3- YES)

S.N.	Objective points	Check point	Score
1.	Does the hospital have easy and direct access to the Emergency Department?	Adequate Signage on the major road and boundary of the Hospital, E.D Board is prominently displayed with illumination in night facility	Score
2.	Does the access road of hospital is wide enough?	Can pass three ambulances at a time	Score
3.	Does the vehicles parked on the way /in front of emergency department?	People are using as parking lot	Score
4.	Does the hospital have separate access for ambulance services?	Sufficient space for Ambulance offloading and turn-around	Score
5.	Does the hospital have designated parking area for Ambulance, Staff and Public?	No vehicles parked on the way/in front of emergency parking, "No Parking Board" placed outside emergency	Score
6.	Does the hospital have smooth entry area with adequate wheel chair, trolley and stretcher bay?	Entrance have a canopy, ramp for stretchers and wheelchairs with Demarcated space for trolleys and wheelchair	Score
7.	Does the hospital have patient attendant at the entrance of hospital to help the patient with the wheel chair, stretcher, etc.?	Staff Responds with a wheel chair, stretcher, trolley promptly	Score
8.	Seamless flow of the patient	Unidirectional flow, separate entrance, no crisscross.	Score
9.	Does the services provided to the patients are clearly defined, displayed prominently?	signage/ boards	Score
10.	Does the names of the doctors and nursing staff on shift/duty/call are displayed and updated?		Score
11.	Is important Telephone numbers are displayed in hospital?	numbers including emergency no, ambulance, blood bank, police, referral centers etc. displayed	Score
12.	Does all relevant information is displayed for the patients and visitors including user charges wherever applicable at the time of procedure/ investigation/admission?	Service charges/ User charges are displayed on a board/printed on pamphlet/ personally counseled, enquiry counter/Help desk/ registration counter / designated staff.	Score

13.	Do you have adequate waiting area?	It has comfortable seating , information board	Score
14.	Do you have safe drinking water facility?	24hrs drinking water facility	Score
15.	Do you have functional male toilets? Do you have functional female toilets? Do you have functional toilets for differently able person with wheel chair?	Male toilet, Female toilet, Toilet for differently able with (at least 1 wheelchair accessible W.C and wash basins present)	Score
16.	Do you have clean facility and is that maintained adequately?	Building is painted, plastered, no cracks and seepage visible and furniture fixtures clean and intact with no junk around	Score
17.	Do you have Cafeteria facility for the family members/ attendants?		Score
18.	Do you have police control room?		Score
19.	Do you have Emergency Registration Counter?		Score
20.	Do you have ambulance driver's room?	Ambulance drivers	Score
Remarks (if any):			

2. INSIDE EMERGENCY (SCORE: 1-NO, 2- PARTIAL, 3- YES)

SN	Objective Elements	Check Point	Score
1.	Do you have emergency department with adequate space as per patient load (Circulation space and open space)?	Admin interview / 1000 m2 per 100patient daily load (NQAS standards),Corridors are broad enough (2-3m) for easy movement of stretcher and Trolley	Score
2.	Does your department has proper layout and demarcated areas as per Triage?	1.Resuscitation Area(Red) 2.Observation Area(Yellow) 3 Ambulatory Area (Green)	Score
3.	Do you have demarcated station for doctors and nurses?	Preferably in the center from where all beds are visible	Score
4.	Do you have demarcated plaster room?		Score
5.	Do you have dedicated Isolation rooms (Emergency Infections)?	Negative pressure and separate AHUe.g. Swine flu/Ebola pts.	Score
6.	Do you have dedicated minor OT?		Score
7.	Do you have provision for Emergency OT?		Score

8.	Do you have point of care lab?	Designated lab area in emergency	Score
9.	Do you have linkage to other facility on the same floor?	Radiology department, OT, Lab etc.	Score
10.	Do you have separate room for examination of rape / sexual assault victim?	As per One stop Centre	Score
11.	Do you have availability of sexual assault forensic evidence kit?	Kit has protocols and guidelines for collection of forensic evidence.	Score
12.	Do you have counselling services for Sexual assault / domestic violence cases?		Score
13.	Do you have demarcated area for keeping dead bodies?		Score
14.	Do you have availability of clean utility room?		Score
15.	Do you have availability of dirty utility room?		Score
16.	Do you have store?	Storage to refrigerate, keep equipment & Emergency supplies	Score
17.	Do you have curtains/screens at point of care?	Privacy and dignity of patients maintained.	Score
18.	Do you have demarcated duty room for doctors?		Score
19.	Do you have demarcated duty room for nursing staff?		Score

ANNEXURE-2: MANPOWER IN EMERGENCY

S.N.	Category	Private		Govt. Hospitals		Medical Colleges	
		Less than 300 beds	More than 300 beds	Less than 300 beds	More than 300 beds	Govt. Medical	Private Medical
1.	Faculty/Consultant						
2.	CMO (casualty medical officer)						
3.	SR (Senior Residents)						
4.	JR (Junior Residents)						
5.	MO (medical officer)						
6.	Intern						
7.	Nursing officer In charge / Team leader						
8.	Staff Nurse/ Nursing Officer						
9.	Radiology technician/ Radiographer						
10.	Lab Technician						
11.	OT. Technician						
12.	H.A*/ GDA*/ Orderly						
13.	SA*/ Housekeeping staff						
14.	EMT						
15.	Security						
16.	Registration staff						
17.	Any other						

**GDA-General Duty Assistant, SA- Sanitary Attendant HA- Hospital Attendant*

Other Specialist/ Super Specialist

S.N.	Specialty	Designation	Timings	24x7 Physically present	On-Call	Empanelled (As and when Required)
1.	Medicine	Consultant				
		Resident				
2.	General Surgery	Consultant				
		Resident				
3.	Pediatrics	Consultant				
		Resident				

4.	Gynecology& Obstetrics	Consultant				
		Resident				
5.	Orthopedics	Consultant				
		Resident				
6.	Radiology	Consultant				
		Resident				
7.	Anesthesia	Consultant				
		Resident				
8.	Critical care	Consultant				
		Resident				
9.	Ophthalmology	Consultant				
		Resident				
10.	ENT	Consultant				
		Resident				
11.	Psychiatry	Consultant				
		Resident				
12.	Dermatology	Consultant				
		Resident				
13.	Forensic Medicine	Consultant				
		Resident				
14.	Lab Medicine	Consultant				
		Resident				
15.	Transfusion Medicine/ Blood Bank	Consultant				
		Resident				
16.	Cardiology	Consultant				
		Resident				
17.	CTVS (Cardiac Surgery)	Consultant				
		Resident				
18.	Neurology	Consultant				

		Resident				
19.	Neurosurgery	Consultant				
		Resident				
20.	Plastic Surgery	Consultant				
		Resident				
21.	Maxillofacial Surgery	Consultant				
		Resident				
22.	Gastroenterology	Consultant				
		Resident				
23.	Nephrology	Consultant				
		Resident				
24.	Urology	Consultant				
		Resident				
25.	Neuro Radiology	Consultant				
		Resident				
26.	Pediatric Surgery	Consultant				
		Resident				
27.	Neonatology	Consultant				
		Resident				
28.	Hematology	Consultant				
		Resident				
29.	Oncology	Consultant				
		Resident				

ANNEXURE-3: EQUIPMENTS & SUPPLIES IN ED

BIO MEDICAL EQUIPMENT (SCORE: 1-NO, 2- PARTIAL, 3- YES)

S.N.	OBJECTIVE ELEMENT	Check points	SCORE
1.	Do you have list of equipment in accordance with its scope of services available?		SCORE
2.	Do you have medical equipment inventory and log book?	Logs are maintained for operational and maintenance purposes	SCORE
3.	Do you have periodically inspected and calibrated equipment record?		SCORE

EQUIPMENTS & SUPPLIES IN ED (SCORE: 1-NO, 2- PARTIAL, 3- YES)

S. No.	24x7 availability of	Score	Remarks
1.	Do you have mobile bed for Resuscitation?	Score	Remarks
2.	Do you have crash cart (specialized cart for resuscitation)?	Score	Remarks
3.	Do you have Hard Cervical collar?	Score	Remarks
4.	Do you have Central Oxygen Supply through pipeline?	Score	Remarks
5.	Do you have Oxygen cylinder?	Score	Remarks
6.	Do you have suction machine?	Score	Remarks
7.	Do you have Multipara Monitor (To monitor Heart rate, BP, SPO2[Essential] ECG, Respiration Rate [Desirable] etc)?	Score	Remarks
8.	Do you have simple monitor/transport monitor?	Score	Remarks
9.	Do you have defibrillator with external pacer?	Score	Remarks
10.	Do you have Toothed Forceps, Kocher Forceps, Magill's forceps, Artery forceps?	Score	Remarks
11.	Do you have transport ventilator?	Score	Remarks
12.	Do you have AMBU Bag for adult and Paediatric?	Score	Remarks
13.	Do you have suprapubic catheter?	Score	Remarks
14.	Do you have light source to ensure visibility (lamp and flash light)?	Score	Remarks
15.	Do you have stethoscope?	Score	Remarks
16.	Do you have oropharyngeal airway adult and pediatric blades?	Score	Remarks
17.	Do you have LMA?	Score	Remarks
18.	Do you have tourniquet?	Score	Remarks
19.	Do you have pelvic binder or bed sheets with clips?	Score	Remarks
20.	Do you have needle holder and suture material (absorbable and non absorbable)?	Score	Remarks

21.	Do you have vaginal speculum?	Score	Remarks
22.	Do you have different sizes of Ryles tube?	Score	Remarks
23.	Do you have different sizes of Foley's catheter?	Score	Remarks
24.	Do you have laryngoscope with all sized blades?	Score	Remarks
25.	Do you have Endotracheal Tubes of all sizes?	Score	Remarks
26.	Do you have Laryngeal Mask Airway (LMA)?	Score	Remarks
27.	Do you have Chest Tubes with Water seal drain?	Score	Remarks
28.	Do you have Blood Pressure monitor?	Score	Remarks
29.	Do you have ECG machine?	Score	Remarks
30.	Do you have ultrasonic nebulizer?	Score	Remarks
31.	Do you have IV cannula and IV infusion sets?	Score	Remarks
32.	Do you have syringes and disposable needles?	Score	Remarks
33.	Do you have broselow tape?	Score	Remarks
34.	Do you have proctoscope?	Score	Remarks
35.	Do you have fluid warmer?	Score	Remarks
36.	Do you have dressing sets (Alcohol based solution, Betadinesolution gauze, roller, adhesive tape)?	Score	Remarks
37.	Do you have personal protecting equipment's (Apron, glove, face mask, eye protection)?	Score	Remarks
38.	Do you have central line of all sizes?	Score	Remarks
39.	Do you have capnography?	Score	Remarks
40.	Do you have Infusion pump and Syringe Drivers?	Score	Remarks
41.	Do you have spine board with sling and scotch tapes all sizes?	Score	Remarks
42.	Do you have splints for all types of fracture?	Score	Remarks
43.	Do you have non-invasive and invasive ventilators?	Score	Remarks
44.	Do you have incubators?	Score	Remarks
45.	Do you have emergency cricothyroidotomy kit?	Score	Remarks
46.	Do you have emergency thoracotomy set?	Score	Remarks
47.	Do you have emergency decompressive craniotomy sets?	Score	Remarks
48.	Do you have emergency thrombectomysets?	Score	Remarks
49.	Do you have phototherapy unit?	Score	Remarks

Remarks (if any):

ANNEXURE-4: POINT OF CARE LAB (SCORE: 1-NO, 2- PARTIAL, 3- YES)

S. No.	Point of Care Lab	In ED	In Hospital	Remarks
1.	Hemogram- Hb, Hct, TLC, DLC, Platelet	Score	Score	Remarks
2.	Random Blood Sugar	Score	Score	Remarks
3.	Coagulation Profile: PT, APTT, INR	Score	Score	Remarks
4.	Electrolytes: Na, K, Cl, Ca	Score	Score	Remarks
5.	Blood Urea & Serum Creatinine	Score	Score	Remarks
6.	Blood Gas Analysis	Score	Score	Remarks
7.	Cardiac enzymes, Trop-I, Trop-T,	Score	Score	Remarks
8.	Serum Amylase	Score	Score	Remarks
9.	D-dimer,	Score	Score	Remarks
10.	Pro-BNP	Score	Score	Remarks
11.	Urinary Ketones	Score	Score	Remarks
12.	Plasma Ketones	Score	Score	Remarks
13.	Toxicology screening- Urinary	Score	Score	Remarks
14.	Serum osmolality	Score	Score	Remarks
15.	Urine osmolality	Score	Score	Remarks
16.	Pregnancy test	Score	Score	Remarks
17.	Thromboelastogram (TEG)	Score	Score	Remarks
18.	Peak expiratory Flowmeter	Score	Score	Remarks
19.	Microscopy: Thick & Thin smear (For Malaria parasite & Gram staining)	Score	Score	Remarks
20.	Rapid diagnostic test for Malaria (Card test)	Score	Score	Remarks
21.	CSF: Microscopy & Gram staining	Score	Score	Remarks
22.	Portable USG (Bed side/Point of Care)	Score	Score	Remarks
23.	Echocardiography	Score	Score	Remarks
24.	Portable X-ray (Bed side/Point of Care)	Score	Score	Remarks
25.	CT scan	Score	Score	Remarks
Remarks (if any):				

ANNEXURE-5: ESSENTIAL MEDICINES FOR EMERGENCY (SCORE: 1-NO, 2- PARTIAL, 3- YES)

S. No.	Drug Name	Score	S. No.	Drug Name	Score
1.	Oxygen medicinal gas	Score	27.	Phenobarbitone	Score
2.	Thiopentone sodium	Score	28.	Phenytoin	Score
3.	Lignocaine hydrochloride (Jelly sterile)	Score	29.	Amoxicillin + Clavulanic acid	Score
4.	Lignocaine hydrochloride (Inj.)	Score	30.	Ampicillin sodium	Score
5.	Atropine	Score	31.	Benzathine penicillin	Score
6.	Diazepam	Score	32.	Cefotaxime	Score
7.	Diclofenac	Score	33	Ceftriaxone powder	Score
8.	Ibuprofen	Score	34.	Amikacin	Score
9.	Paracetamol (Tablet)	Score	35.	Ciprofloxacin	Score
10.	Paracetamol (Syrup)	Score	36.	Gentamycin sulphate	Score
11.	Paracetamol (Inj.)	Score	37.	Metronidazole	Score
12.	Morphine sulphate	Score	38.	Heparin sodium	Score
13.	Tramadol hydrochloride (Tablet)	Score	39.	Ethamsylate	Score
14.	Tramadol hydrochloride (Inj.)	Score	40.	Vitamin K	Score
15.	Cetrizine	Score	41.	Plasma volume exppander	Score
16..	Pheniramine maleate	Score	42.	Diltiazem	Score
17.	Dexamethasone disodium	Score	43.	Glycerinetrinitrate	Score
18.	Hydrocortisone sodium Succinate	Score	44.	Glycerinetrinitratenitroglycerine	Score
19.	Adrenaline	Score	45.	Isosorbidemononitrate	Score
20.	Charcoal activated	Score	46.	Isosorbidedinitrate	Score
21.	Antisnake venom	Score	47.	Adenosine phosphate	Score
22.	Calcium gluconate	Score	48.	Dobutamine	Score
23.	Naloxone hydrochloride	Score	49.	Dopamine hydrochloride	Score
24.	Pralidoxime (PAM)	Score	50.	Streptokinase	Score
25.	Lorazepam	Score	51.	Potassium permanganate	Score
26.	Magnesium sulphate	Score	52.	Silver sulfadiazine	Score
53.	Calamine lotion	Score	78.	Xylometazoline	Score
54.	Povidone iodine (Solution)	Score	79.	Glycerine	Score
55.	Povidone iodine (Ointment)	Score	80.	Oxytocin	Score
56.	Furosemide	Score	81.	Haloperidol	Score
57.	Mannitol	Score	82.	Alprazolam	Score
58.	Rantidine	Score	83.	Aminophylline	Score
59.	Metoclopramide hydrochloride	Score	84.	Ipratropium bromide – aerosol	Score

60.	Prochlorperazine	Score	85.	Salbutamol sulphate	Score
61.	Ondansetron	Score	86.	Etophylline + Theophylline	Score
62.	Promethazine hydrochloride	Score	87.	Budesonide	Score
63.	Promethazine	Score	88.	Glucose/dextrose	Score
64.	Hyiscine butyl bromide	Score	89.	Glucose with sodium chloride/ saline	Score
65.	Glycerine saline	Score	90.	Potassium chloride	Score
66.	Oral rehydration salts	Score	91.	Ringer lactate	Score
67.	Insulin (soluble)	Score	92.	Sodium bicarbonate	Score
68.	Intermediate-acting insulin (Lente)	Score	93.	Sodium chloride	Score
69.	Anti-Rabies Immunoglobulin	Score	94.	Water for injection	Score
70.	Tetanus vaccine	Score	95.	Artesunate	Score
71.	Anti-Rabies vaccine	Score	96.	Artemether	Score
72.	Neostigmine	Score	97.	Quinine (Dihydrochloride)	Score
73.	Ciprofloxacin	Score	98.	Chloroquinine phosphate	Score
74.	Atropine sulphate	Score	99.	Amiodarone	Score
75.	Tropicamide + Phenylepherine	Score	100.	Digoxin	Score
76.	Sodium carboxymethyl cellulose	Score	101.	Pantoprazole	Score
77.	Saline	Score			

Remarks (if any):

LIVE OBSERVATION

1.	Name of the hospital:		Name of Inspection Team Member: 1.
2.	Type of Health Care Facility	District Hospital	2.
		Tertiary Care	3.
		Apex Tertiary Car	Date of Inspection:

INITIAL ASSESSMENT AND REASSESSMENT

(Score: 1-No/Never, 2- Partial, 3- Yes (24X7 basis)

<table>
<tr><th>S.N.</th><th>Objective Elements</th><th colspan="4">Check Point</th><th>Score</th></tr>
<tr><td>1.</td><td colspan="2">Does the emergency department priorities initial assessment of the patient?</td><td colspan="4">Time: Red – 10 mins, Yellow- 30 mins, Green- 4 hours of arrival</td><td>SCORE</td></tr>
<tr><td>2.</td><td colspan="2">Does the hospital staff record all treatment, assessment and reassessment details in patient record sheet?</td><td colspan="4">Direct Observation & Patient records (Only few samples)</td><td>SCORE</td></tr>
<tr><td rowspan="7">3.</td><td colspan="2" rowspan="7">Record the disposition time of patients from their arrival to departure from hospital [in minutes].
Minimum number of patients to be recorded:
<table><tr><th></th><th>Red</th><th>Yellow</th><th>Green</th></tr><tr><td>>500 beds</td><td>5</td><td>5</td><td>10</td></tr><tr><td>300-500 beds</td><td>2</td><td>2</td><td>5</td></tr><tr><td>100-300 Beds</td><td>2</td><td>2</td><td>5</td></tr></table>Disposal Time (Emergency Department) = Arrival time (Registration time) to Admission/ discharge/ transfer out time</td><td>Red</td><td>Yellow</td><td colspan="2">Green</td></tr>
<tr><td>P1: Disposal Time</td><td>P1: Disposal Time</td><td>P1: Disposal Time</td><td>P6: Disposal Time</td></tr>
<tr><td>P2: Disposal Time</td><td>P2: Disposal Time</td><td>P2: Disposal Time</td><td>P7: Disposal Time</td></tr>
<tr><td>P3: Disposal Time</td><td>P3: Disposal Time</td><td>P3: Disposal Time</td><td>P8: Disposal Time</td></tr>
<tr><td>P4: Disposal Time</td><td>P4: Disposal Time</td><td>P4: Disposal Time</td><td>P9: Disposal Time</td></tr>
<tr><td>P5: Disposal Time</td><td>P5: Disposal Time</td><td>P5: Disposal Time</td><td>P10: Disposal Time</td></tr>
</table>

1. CHEST PAIN

Instructions: Please, score ***YES/ NO*** below the objective elements (check points) in the table. If No, than reason should be score for the categories provided below based on scale **(1-5)**. The scale score for each category will be as follows:

a. **Manpower (Score 1-5)** – **1:** Minimal manpower, **2:** Inadequate manpower in all shifts, **3:** Inadequate manpower in some shifts, **4:** Adequate manpower with coverage**5:** Adequate manpower available for 24*7

b. **Training (Score 1-5) –1:** None, **2:** Only few are trained, **3:**Only doctors are trained, **4:** Mostly staff are trained, **5:** All are trained

c. **Supply (Score 1-5)–1:**No supply available, **2:** Minimal Supply available, **3:** Inadequate supply available only in some shifts, **4:** Inadequate supply available on 24*7 basis, **5:** Adequate supply available for 24*7

d. **Infrastructure (Score 1-5)–1:** No infrastructure and no tie up with other facilities, **2:** Not having any infrastructure but tie up with other facilities, **3:** Infrastructure available but not functioning at all, **4:** Infrastructure available but functioning only for limited hours, **5:** Infrastructure available for 24*7

e. **Policy (Score 1-5)–1:** No policy available, **2:** Some policy is available but not standard, **3:** Organizational policy in place but not in use, **4:** Organizational policy in place but sometime in use, **5:** Organizational policy in place and in use

Objective Elements	Patient 1				
Triage (Red)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to ECG (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door To Needle(<30min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to PCI; wire crossing (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 2				
Triage (Red)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to ECG (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door To Needle(<30min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to PCI; wire crossing (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 3				
Triage (Red)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to ECG (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door To Needle(<30min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Door to PCI; wire crossing (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 4				
Triage (Red)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to ECG (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door To Needle(<30min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to PCI; wire crossing (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 5				
Triage (Red)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to ECG (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)

Any Other Reason	Please Specify				
Door To Needle(< 30min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to PCI; wire crossing (< 90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

2. STROKE

Instructions: Please, score ***YES/ NO*** below the objective elements (check points) in the table. If No, than reason should be score for the categories provided below based on scale **(1-5)**. The scale score for each category will be as follows:

a. **Manpower (Score 1-5)** – **1:** Minimal manpower, **2:** Inadequate manpower in all shifts, **3:** Inadequate manpower in some shifts, **4:** Adequate manpower with coverage**5:** Adequate manpower available for 24*7

b. **Training (Score 1-5) –1:** None, **2:** Only few are trained, **3:**Only doctors are trained, **4:** Mostly staff are trained, **5:** All are trained

c. **Supply (Score 1-5)–1:**No supply available, **2:** Minimal Supply available, **3:** Inadequate supply available only in some shifts, **4:** Inadequate supply available on 24*7 basis, **5:** Adequate supply available for 24*7

d. **Infrastructure (Score 1-5)–1:** No infrastructure and no tie up with other facilities, **2:** Not having any infrastructure but tie up with other facilities, **3:** Infrastructure available but not functioning at all, **4:** Infrastructure available but functioning only for limited hours, **5:** Infrastructure available for 24*7

e. **Policy (Score 1-5)–1:** No policy available, **2:** Some policy is available but not standard, **3:** Organizational policy in place but not in use, **4:** Organizational policy in place but sometime in use, **5:** Organizational policy in place and in use

Objective Elements	Patient 1				
Door to Doctor (< 10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion (< 25min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT reading (< 45 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to Thrombolytic (< 60 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to first pass (< 90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 2				
Door to Doctor (< 10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion (< 25min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)

Any Other Reason	Please Specify				
Door to CT reading (<45 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to Thrombolytic (<60 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to first pass (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 3				
Door to Doctor (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion (<25min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT reading (<45 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to Thrombolytic (<60 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)

Any Other Reason	Please Specify				
Door to first pass (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 4				
Door to Doctor (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion (<25min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT reading (<45 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to Thrombolytic (<60 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to first pass (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 5				
Door to Doctor (<10min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion (<25min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT reading (<45 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to Thrombolytic (<60 min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to first pass (<90min)	**YES/ NO**				
If No, than score the reasons	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

3. TRAUMA (RED CATEGORY)

Instructions: Please, score ***YES/ NO*** below the objective elements (check points) in the table. If No, than reason should be score for the categories provided below based on scale **(1-5)**. The scale score for each category will be as follows:

a. **Manpower (Score 1-5) – 1:** Minimal manpower, **2:** Inadequate manpower in all shifts, **3:** Inadequate manpower in some shifts, **4:** Adequate manpower with coverage**5:** Adequate manpower available for 24*7

b. **Training (Score 1-5) –1:** None, **2:** Only few are trained, **3:**Only doctors are trained, **4:** Mostly staff are trained, **5:** All are trained

c. **Supply (Score 1-5)–1:**No supply available, **2:** Minimal Supply available, **3:** Inadequate supply available only in some shifts, **4:** Inadequate supply available on 24*7 basis, **5:** Adequate supply available for 24*7

d. **Infrastructure (Score 1-5)–1:** No infrastructure and no tie up with other facilities, **2:** Not having any infrastructure but tie up with other facilities, **3:** Infrastructure available but not functioning at all, **4:** Infrastructure available but functioning only for limited hours, **5:** Infrastructure available for 24*7

e. **Policy (Score 1-5)–1:** No policy available, **2:** Some policy is available but not standard, **3:** Organizational policy in place but not in use, **4:** Organizational policy in place but sometime in use, **5:** Organizational policy in place and in use

Objective Elements	Patient 1				
Door to Resuscitation time (<15min)	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion time in Head Injury *(<45min)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Disposal time *(Arrival time to Admission/Transfer out/ Death declaration time)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 2				
Door to Resuscitation time (<15min)	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion time in Head Injury *(<45min)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Disposal time *(Arrival time to Admission/Transfer out/ Death declaration time)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 3				
Door to Resuscitation time (<15min)	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion time in Head Injury *(<45min)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Disposal time *(Arrival time to Admission/Transfer out/ Death declaration time)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 4				
Door to Resuscitation time (<15min)	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion time in Head Injury *(<45min)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Disposal time *(Arrival time to Admission/Transfer out/ Death declaration time)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Objective Elements	Patient 5				
Door to Resuscitation time (<15min)	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Door to CT completion time in Head Injury *(<45min)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				
Disposal time *(Arrival time to Admission/Transfer out/ Death declaration time)*	**YES/ NO**				
If No, *than reason*	Manpower	Training	Supplies	Infrastructure	Policy or Guidelines
	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)	Score (1-5)
Any Other Reason	Please Specify				

Incidence of Violence

Is there any violence with patient or healthcare provider observed?

1.1. If yes, than violence observed (please tick) was: (1) Verbal ☐ (2) Physical ☐ (3) Both ☐

1.2. Please tick the reason of the violence that was observed; (1) Communication Failure ☐ (2) Care Delay ☐ (3) Inappropriate Care ☐ (4) Inappropriate Behavior of healthcare professional ☐

1.3. **Mitigation measures available:**

- Private Security Guard — Yes/No
  If yes, Available for 24*7 basis — Yes/No
- Police Available — Yes/No
  If yes, Available for 24*7 basis — Yes/No
- Anti-violence mitigation policy available — Yes/No

Communication in Emergency Department

Mention the type of communication followed by the healthcare providers/staff/nurses with the patients in emergency department (Please tick below).

1. Full content with empathy and share decision making ☐
2. Full content with empathy and no share decision making ☐
3. Full content with no empathy ☐
4. Minimal communication and inappropriate behaviour ☐
5. No communication at all ☐

Patient Satisfaction

Perform one interview with patient or relative of the patient and please ask the following questions:

1. For Patient in **Red Triage;**

1.1. Does the patient/relative is satisfied with the emergency department services? Yes/No

If yes, please ask the patient satisfaction level based on the scale:

Extremely Satisfied	Very Satisfied	Moderately Satisfied	Slightly Satisfied	Not at all Satisfied
☐	☐	☐	☐	☐

If not satisfied, reason .....

2. For Patient in **Yellow Triage;**

2.1 Does the patient/relative is satisfied with the emergency department services? Yes/No

If yes, please ask the patient satisfaction level based on the scale:

Extremely Satisfied	Very Satisfied	Moderately Satisfied	Slightly Satisfied	Not at all Satisfied
☐	☐	☐	☐	☐

If not satisfied, reason .....

3. For Patient in **Green Triage;**

3.1 Does the patient/relative is satisfied with the emergency department services? Yes/No

If yes, please ask the patient satisfaction level based on the scale:

Extremely Satisfied	Very Satisfied	Moderately Satisfied	Slightly Satisfied	Not at all Satisfied
☐	☐	☐	☐	☐

If not satisfied, reason .....

Referral of the Patient

What is the referral policy of patient in the organization? Please answer (Yes/No) the following questions:

1. Is there any referral policy in the organization? Yes/No
2. Is there any proper arrangement of patient referral? Yes/No
3. Is there any assistance during the patient referral? Yes/No

   3.1. **If Yes,** type of assistance

   (1) Technician ☐ (2) Nurse ☐ (3) Doctor ☐ (4) Other ☐

   (If other, please specify .....)

Details of the patient *to be filled by registration desk* for last 24 Hours

Health Facility Name:	Time:	Date:
Total Patients visited in Hospital for last 24 Hours Numbers	Adult-	Pediatric- (please write the cut off age)
Total Number of Patients visited in Emergency Department for last 24 Hours Numbers	Adult-	Pediatric- (please write the cut off age)
Total admissions in emergency department Numbers	Adult-	Pediatric- (please write the cut off age)

Total Leaving Against Medical Advice (LAMA) from emergency department Numbers	Adult-	Pediatric- (please write the cut off age)
Total discharge from emergency department Numbers	Adult-	Pediatric- (please write the cut off age)
Total Death in emergency department Numbers	Adult-	Pediatric- (please write the cut off age)
Total Death in emergency department-Trauma/Injury/Road Traffic Accidents Numbers	Adult-	Pediatric- (please write the cut off age)

Adult Patients *(Please tick one check box for one patient)*	Pediatric Patients *(Please tick one check box for one patient)*
1. Chest Pain Patients	**1. Respiratory distress**
2. Stroke	**2. Diarrheal disease**
3. Altered Mental status	**3. Altered Mental status**

Adult Patients *(Please tick one check box for one patient)*	Pediatric Patients *(Please tick one check box for one patient)*
4. Trauma/ Road Traffic Accidents/ Injuries	**4. Trauma/ Road Traffic Accidents/ Injuries**
5. Respiratory Distress	**5. Seizure**
6. Pain abdomen	**6. Pain abdomen**

Adult Patients *(Please tick one check box for one patient)*	Pediatric Patients *(Please tick one check box for one patient)*
7. Poisoning	**7. Poisoning**
8. Snake Bite	**8. Snake Bite**
9. Fever	**9. Fever**

Adult Patients

(Please tick one check box for one patient)

10. Pregnancy Related

☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐

ANNEXURE-III: LIST OF SCIENTIFIC ADVISORY COMMITTEE MEMBERS

S. No.	Name of Member	Designation	E-mail ID
1.	Dr. Prof. Anurag Srivastava	Professor & Head of Department of Surgical Disciplines, AIIMS, New Delhi	dr.anuragsrivastava@gmail.com
2.	Dr. Prof. Ashish Bhalla	Professor, Department of Internal Medicine, PGIMER, Chandigarh	bhalla.chd@gmail.com
3.	Dr. Prof. Ashok Deorari	Department of Neonatology, AIIMS, New Delhi	ashokdeorari_56@hotmail.com
4.	Dr. Prof. D. Prabhakaran	Vice President (Research& Policy), Public Health Foundation of India Executive Director of Centre for Chronic Disease Control New Delhi	dprabhakaran@phfi.org
5.	Dr. Prof. Deepak Agarwal	Professor, Department of Neurosurgery, JPNATC, New Delhi	drdeepak@gmail.com
6.	Dr. Gururaj Gopalakrishnan	Department of Epidemiology WHO Collabrating Centre for Injury Prevention & Safety Promotion Centre for Public Health	epiguru@yahoo.com, guru@nimhans.kar.nic.in

S. No.	Name of Member	Designation	E-mail ID
7.	Dr. Jayaraj Mymbilly Balakrishnan	Professor & Head of Department of Emergency Medicine, KMC, Mangalore	jayarajmb2004@gmail.com
8.	Dr. Jayashree Muralidharan	Department of Pediatrics, Advanced Pediatrics Centre, PGIMER, Chandigarh	mjshree@hotmail.com
9.	Dr. Prof. Kameshwar Prasad	Professor Ex- HOD, Department of Neurology, AIIMS, New Delhi, Chief Neurosciences Centre, AIIMS, New Delhi	drkameshwarprasad@gmail.com
10.	Dr. Mathew Varghese	Orthopedist, Department of Orthopedics, St. Stephen's Hospital	mathewvarghese.ms@gmail.com
11.	Dr Prof. Narendra K. Arora	Executive Director, INCLEN Trust International	nkarora@inclentrust.org
12.	Dr. Nobhojit Roy	Advisor, Public Health Planning, NHSRC, MoHFW, Government of India	nobsroy@gmail.com
13.	Dr. Patanjali Dev Nair	Department of Non-communicable Diseases and Environment Health (NDE) WHO Regional Officer for South-East Asia, I.P. Estate, New Delhi	nayarp@who.int
14.	Dr. Prof. Rajesh Malhotra	Professor & Head of Department of Orthopedics, AIIMS, New Delhi Chief of JPNATC, New Delhi	chiefoffice06@gmail.com
15.	Dr. Prof. Shakti Gupta	Professor, Department of Hospital Administration, AIIMS, New Delhi	shakti810505@gmail.com
16.	Dr. Prof. Vivek Trikha	Professor, Department of Orthopedics, JPNATC, AIIMS, New Delhi	vivektrikha@gmail.com
17.	Dr. Yogesh Suri	Senior Advisor, NITI Aayog, New Delhi	yogesh.suri@nic.in

ANNEXURE-IV: PATIENT INFORMATION SHEET

Study Title: *"A country-level Gap Analysis of the current status of emergency and injury care at* secondary and tertiary care centres in India"

SUBJECT INFORMATION SHEET & INFORMED CONSENT DOCUMENT

Purpose of the study: This study is being conducted as a country level assessment of emergency and injury current status of facility based Emergency and Injury care in prefixed 50 government medical colleges (75%), large private hospitals (25%) and 50 district hospitals in India. Department of Emergency Medicine JPN Apex Trauma Centre, AIIMS, New Delhi is conducting this national level assessment in collaboration with NITI Aayog and Ministry of Health and Family Welfare, New Delhi. This project is introduction of current status of emergency and injury care at tertiary care (both public and private) and district hospitals through gap analysis in India. This project is documenting the current status of emergency and injury care in the tertiary care and district health care facilities through collection of data sets from the hospitals including live data recording of de-identified clinical cases for 24 hours.

Participation: For the study, we have received the administrative approval from state and district authorities. As the concerned health staff of the health facility, we wish to obtain your feedback on few aspects of emergency and injury care. Thus, we are inviting you to participate in the project.

Study Procedures:

- For the participation, you will be asked to sign a consent form and one copy of the signed consent form will be given to you.
- Then the assessor shall discuss with you on few issues related to the emergency and injury care.
- The information and opinion shared by you shall be treated as confidential. Your identifiers shall not be collected.

Duration of participation: Your participation for this study is limited to one time contact only and shall end with end of the interaction. No further contact shall be required.

Data collection during contact: The assessors shall collect the practices followed and opinions related to emergency and injury care at your facility. The assessors shall use a guide to collect the information and the process is expected to take about 2 days.

Risks and Benefit: Your identification shall not be collected and used in analysis. The information shared by you shall be treated as confidential and shall not be shared with any identifier with the administration or any other person. There is no financial benefit to you. But your participation shall assist understanding the current gaps for strengthening and expanding the linkages of emergency and injuries care at national level.

Confidentiality: Your identification and information shared by you will be treated as confidential. All information collected will be labeled with a unique ID and not with your name or any other identifying information. All project documents and records will be kept under lock and key or computers with passwords under supervision of the Investigators. This information may be looked at ethics committee members reviewing the study.

Compensation for participation: There will be no monetary compensation provided for participation in this study.

Contact details: If you have a concern about any aspect of participation, contact the investigator(s) from the hospital or related to the project. Their telephone numbers and address are listed below.

Name and address of responsible persons:

Dr Sanjeev Kumar Bhoi
Principal Investigator
Professor
Department of Emergency
Medicine JPN Apex Trauma
Centre, AIIMS, New Delhi
Email:sanjeevbhoi@gmail.com

Dr. Tej Prakash Sinha
Co-Investigator
Associate Professor
Department of Emergency
Medicine JPN Apex Trauma
Centre, AIIMS, New Delhi
Email:drsinha1234@gmail.com

ANNEXURE-V: CONFIDENTIALITY / CONFLICT OF INTEREST AGREEMENT FORM FOR NATIONAL ASSESSOR

In recognition of the fact, that I.....*(Name and Designation),and his/her affiliation*.....herein referred to as the "Undersigned", has been engaged as a **National Assessor** of the AIIMS, has been asked to assess a national project titled "**A country level assessment of current status of emergency and injury care at secondary and tertiary level centers in India**" to be conduct by Department of Emergency Medicine JPN Apex Trauma Centre, AIIMS, New Delhi funded by the NITI Aayog.

This Agreement thus encompasses any information deemed Confidential or Proprietary provided to the Undersigned in conjunction with the duties as a **National Assessor**. Any written information provided to the Undersigned that is of a Confidential, Proprietary, or Privileged nature shall be identified accordingly.

As such, the Undersigned agrees to hold all Confidential or Proprietary trade secrets ("information") in trust or confidence and agrees that it shall be used only for contemplated purposes, shall not be used for any other purpose or disclosed to any third party. Written Confidential information provided shall not be copied or retained. All Confidential information (and any copies and notes thereof) shall remain the sole property of the Department of Emergency Medicine JPN Apex Trauma Centre, AIIMS, New Delhi.

The Undersigned agrees not to disclose or utilize, directly or indirectly, any Confidential or Proprietary information belonging to a third party in fulfilling this agreement. Furthermore, the Undersigned confirms that his/her performance of this agreement is consistent with the institute's policies and any contractual obligations they may have to third parties.

The Undersigned will immediately disclose to the Principal Investigator of project, any actual or potential conflict of interest that he/she may have in relation to any particular and to abstain from any participation in the project.

When a National Assessor has a conflict of interest, the assessor should notify the Principal Investigator and except to provide information requested by the Principal Investigator.

AGREEMENT ON CONFIDENTIALITY AND CONFLICT OF INTEREST

Please sign and date this Agreement, if the Undersigned agrees with the terms and conditions *set forth above. The original (signed and dated Agreement) will be kept on* file *in the custody of the JPNATC, Department of Emergency (WHO collaborated Centre) AIIMS. A copy will be given to you for your records.*

In the course of my activities as a **National Assessor** for this countrywide project for onsite assessments, I may be provided with confidential information and documentation (which we will refer to as the "Confidential Information"). I agree to take reasonable measures to protect the Confidential Information; subject to applicable legislation, including the Access to Information Act, not to disclose the Confidential Information to any person; not to use the Confidential Information for any purpose outside the mandate, and in particular, in a manner which would result in a benefit to myself or any third party; and to return all Confidential Information (including any minutes or notes I have made as part of my duties) to the Principal Investigator upon termination of my functions as a National Assessor.

Whenever I have a conflict of interest, I shall immediately inform the Principal Investigator not to count me toward a quorum for candidate.

Upon signing this agreement, I agree to take reasonable measures and full responsibility to keep the information as confidential.

I, ..., have read and accept the aforementioned terms and conditions as explained in this Agreement.

_____	_____
Undersigned (National Assessor)	Principal Investigator
_____	_____
Date & Place	Date &Place

Phone Number: 011-26731068

Email: Office@whoccemcare.org

Office: Room No. 117, First Floor, Department of Emergency Medicine, JPNATC, AIIMS, Ring Rd., Raj Nagar, New Delhi-110029

Designed by yaap