A COUNTRY LEVEL ASSESSMENT OF CURRENT STATUS OF EMERGENCY AND INJURY CARE AT SECONDARY AND TERTIARY LEVEL CENTRES IN INDIA

Project Report

Submitted to

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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.

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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
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
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 Aayog	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 SukhlalKarnani Memorial
STNM	Sir ThutobNamgyal 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

EXECUTIVE SUMMARY

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Medical emergencies including Road Traffic Injuries are one of the majorleading 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 100 tertiary and secondary level hospitals in 29 States and 2 Union Territories from 5 regions of India was conducted.

The selected health facilities consisted of 20 hospitals each under the following categories: Govt. Medical Colleges, Private hospitals>300 bed strength, Private hospitals<300 bed strength, Government hospitals >300 bed strength and Government 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 9-13% of all patients presenting to a health facility and 19-24% of admissions in Govt Hospitals and 31-39% admissions in Private Hospitals.
- Live observations revealed that emergency cases accounted for 11-30% 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=4677): Trauma and road-traffic injuries (24%), Fever (20%), Pain Abdomen (16%), Respiratory Distress (11%), Chest Pain (9%), Pregnancy-related (6%), altered mental status (5%), Poisoning (4%), Stroke (3%) and Snake bite (2%)

    - Pediatric patients (n=1403): Fever (31%), Diarrhoea (21%), Respiratory distress (17%), Pain abdomen (14%), Trauma and road traffic injuries (9%), Seizures (4%), altered mental status (2%), poisoning (1%) and Snake bite (1%).

Ambulance Services

- Even though 91% of hospitals had in-house ambulances, trained paramedics needed to assist ambulance services were present only in 34%.
- Provision of specialized care during ambulance transport were largely poor: only 19% hospitals had mobile Stroke/ STEMI (for heart attack) program, with only 4% having a mobile Stroke unit.
- Most of the hospitals lacked Pre-hospital arrival notification system, with larger representation of Government over Private Hospitals.

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 (73%), demarcated triage area (65%), police control room (56%), separate access for ambulance (55%) and adequate spacing for emergency department (52%).
- Overall, on a standard matrix of assessment, Private Hospitals ranked better than Government Hospitals.

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 found satisfactory at all private hospitals (86-93%) and Govt medical college hospitals (68%), with deficiencies found largely in smaller government hospitals (45-60%).
- Specifically, equipment deficiencies pertained largely to the category of Pediatric-care (75%). Equipments pertaining to Airway, Breathing, Circulation and General categories had deficiencies pertaining to a few sets of specific equipments (10-72%).

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 only 9% of all hospitals, fulfilled this criterion.
- Overall, Private colleges fared better in maintaining the recommended inventory of recommended medicines (86-89%) compared to Govt Hospitals (52-72%).

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 47-60% depending on the type of services and hospital facility.
- 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 Govt Hospitals.
- Many Govt Medical Colleges lacked common HDU (55%), Cardiac ICU (55%) and Neuro ICU (55%). In addition, they also lacked facilities for Coronary Artery By-pass Graft (55%), Cardiac Cath Labs (30%) and interventional radiology (40%).

Blood Bank services

- An in-house 24*7 functional Blood Banks were available in 90% of Govt Medical Colleges, 70% of Govt Hospitals with >300 beds and 35% of Govt Hospitals with < 300 beds. While in Private there were present in 85% of Hospitals with > 300 beds and 65% of Hospitals <300 beds.
- 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 Government Medical Colleges (90 Minutes) vis-à-vis Private Hospital (15 minutes). The reasons

for this delay amongst others were due to: high patient load, lack of in-house specialists in the ED, need for multiple cross referrals, with an overarching lack of a dedicated department for emergency services.

- On study of efficiency of various time-bound procedures that need to be conducted for optimal management of Chest Pain, Stroke and Trauma; generally Private Hospitals fared better than Government Hospitals. And amongst the latter, smaller hospitals fared worse.
- Violence between relatives of the care-seekers and health care providers were noticed 22-47% of hospitals, with higher representations from Government Hospitals. The reasons were largely due to delay in providing care in Government Hospitals and failure of appropriate communication in the Private set-ups.
- Most of the Private Hospitals and smaller Government 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 Private Hospitals were largely satisfied with the services provided (65-82%) in contrast to Government Hospitals (31% to 65%)

MLC Burden

- The burden of Medico-legal cases (MLC) was 2-9% of all admissions.
- They were disproportionately more MLCs at Government Medical College Hospitals than others (9% Vs 3%), probably due to higher selective transfer of such cases form other hospitals to avoid procedural issues.

ED protocols, Quality measures and Disaster planning

- Most of the Government Hospitals lacked SOPs/standard manuals for emergency care, patient transfer-in/out and handling of death. Further, policies for triaging and disaster management were found only in ~50% of Government Hospitals and were largely present in Private Hospitals.
- Specific protocols for definitive care for chest pain, suspected sepsis, stroke, trauma and cardiac arrest were found lacking across the spectrum of hospitals, with a higher share of Government Hospitals. Similar patterns were seen for Disaster management planning and systems to enforce continuous quality improvements.

Computerized data entry systems

- Though computerized electronic health records, patient registration system were present at most of the hospitals; specific computerized systems for patient clinical examination notes, lab investigation reports and for data retrieval for research were largely deficient in the Government Hospitals.
- Most of the hospitals across the spectrum 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. Of the zones, the Eastern Zone was the worst afflicted in terms of receipt of funds from Central/ State Government.
- On assessing funding for overall hospital services, Ayushman Bharat as the major funding Scheme (53%) followed by NHM (15%), Other State, Central Government and PSU Schemes (11% each)

Comparison of various Hospital set-ups

NABH accredited vs non-accredited Hospitals

- Overall, NABH accredited Hospitals fared better on all counts that required maintenance of rigour of quality and services to deliver optimal patient care and functioning of systems.

Presence of ongoing academic program in Emergency Medicine

- Hospitals conducting structured academic programs in the subject of Emergency Medicine have comprehensive robust systems in place for efficient patient care services including critical care and definitive care, tackling imminent disasters and continuous quality improvement.
- These systems also ensure effective communication skills amongst care givers and timely delivery of care, translating into higher patient satisfaction levels.

Secondary Vs Tertiary level Government Hospitals

- Secondary level Government Hospitals (District Hospitals) fared better than tertiary level hospitals (Medical Colleges) in terms of having standard SOPs for management of cases, mock-drills, regular audits, referral policies and better patient satisfaction responses.
- However, most of them needed further strengthening of following services: Blood Bank facilities and definitive care such as operative procedures and critical care.

Private Vs Government Hospitals

- Private Hospitals fared better than the Government Hospitals in terms of having emergency operative services, mock drills, training programmes, regular audits and referral policies.
- Private Hospitals also ensure effective communication skills amongst care givers andtimely delivery of care, translating into higher patient satisfaction levels.

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 effortsmade 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.

INTRODUCTION

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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 100 healthcare facilities 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

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 healthcoverage.

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)]

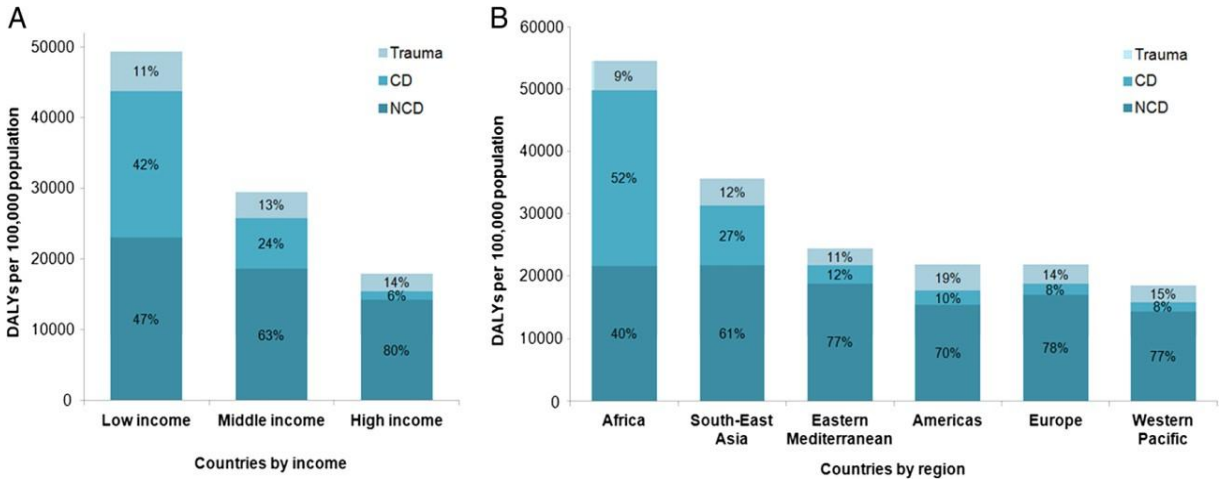
Simple, low-cost interventions to strengthen timely emergency care delivery can have dramatic impact on clinical outcomes, and well-integrated emergency care has enormous potential to save lives even with limited input of new material resources.

Burden of Emergency Conditions in the South-East AsianRegion

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***

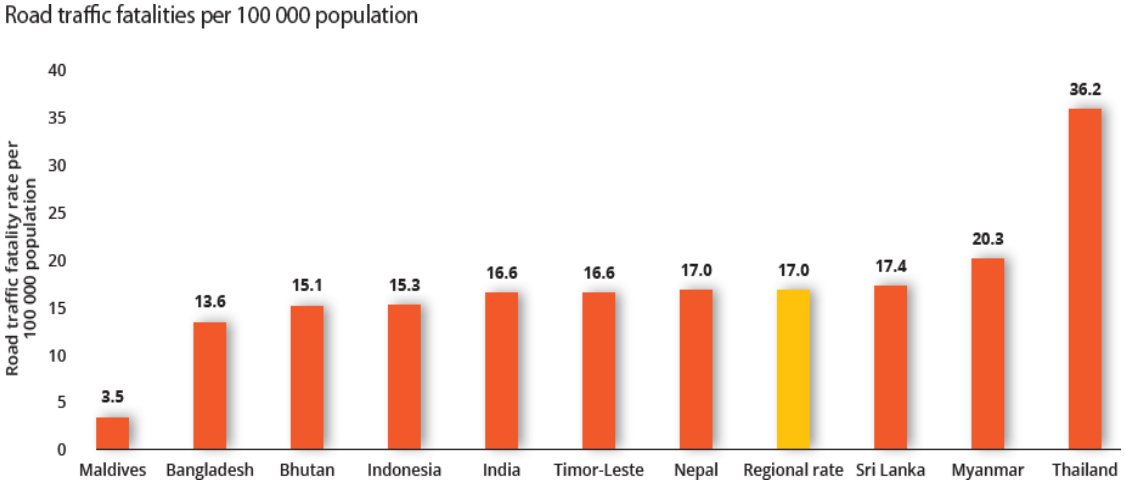
II.	***Non-communicable diseases***	***9428***	***63.5***	***13472***	***72.5***
	A. Cardiovascular diseases	4159	28.0	5872	31.6
	B. Respiratory diseases	1712	11.5	2561	13.8
	C. Malignant neoplasms	1412	9.5	2310	12.4
	D. Diabetes mellitus	434	2.9	690	3.7
III.	***Injuries***	***1676***	***11.3***	***2125***	***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 6thin 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 injuriesare 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]

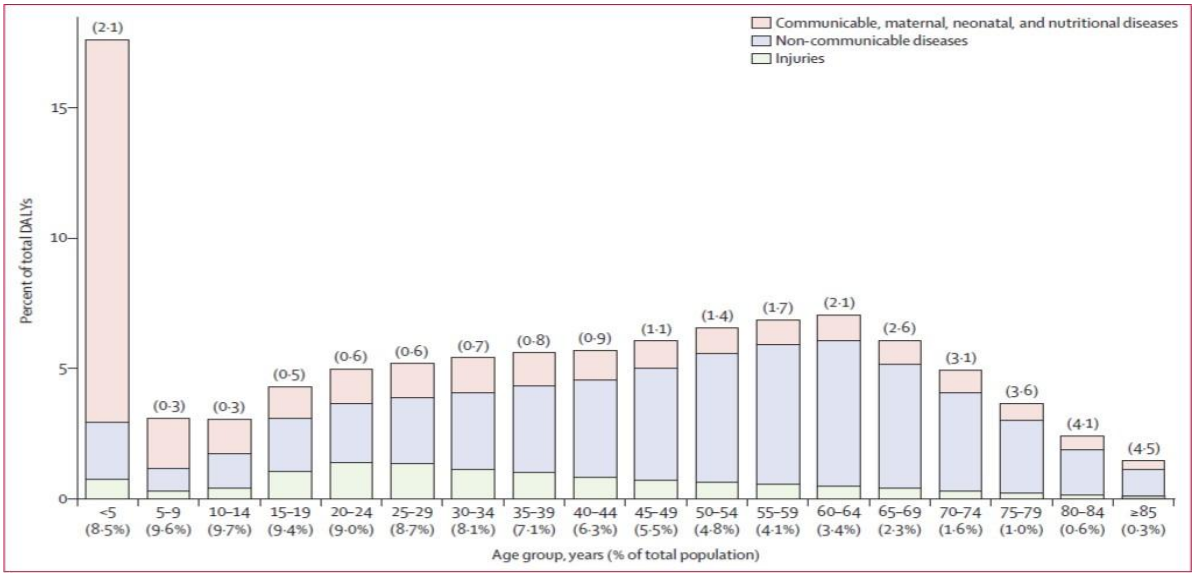
Table 2: Percentage contribution of disease categories to total deaths by age groups for all of India, 2016[6]

	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 diseaseswas 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 andtrauma.

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 emergencyconditions.

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.

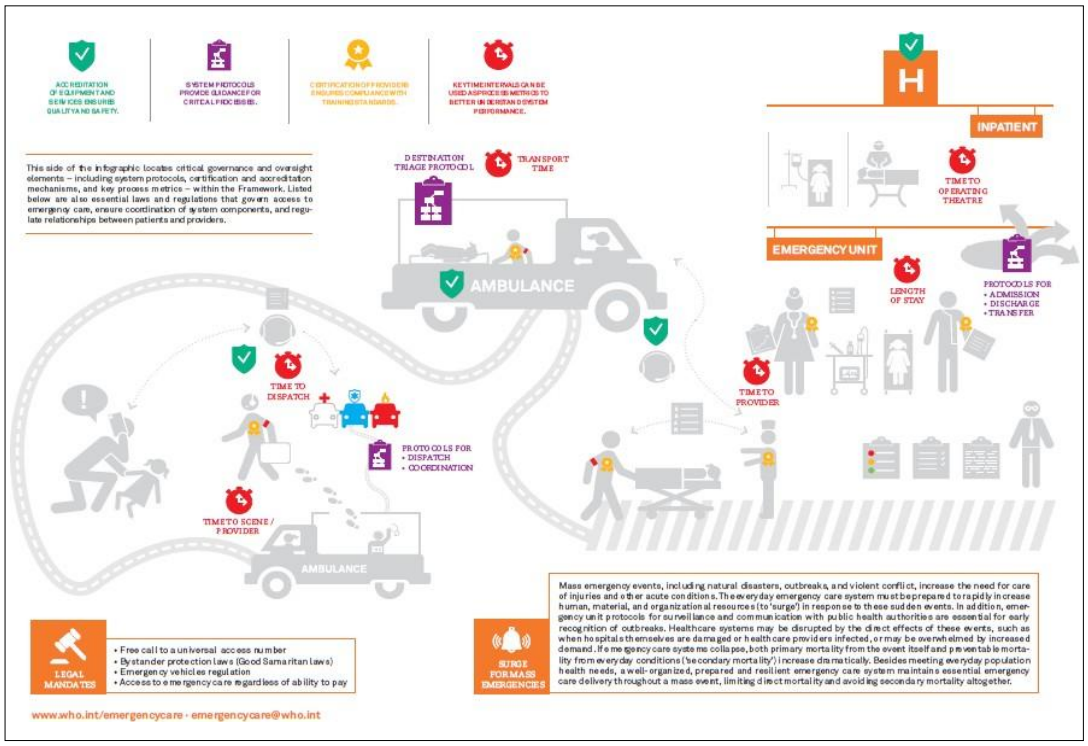
Figure 4a illustrates the essential functions of an effective emergency care system, and the key human resources, equipment, and information technologies needed to execute them (organized by health systems buildingblocks).

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 patientsandproviders.

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

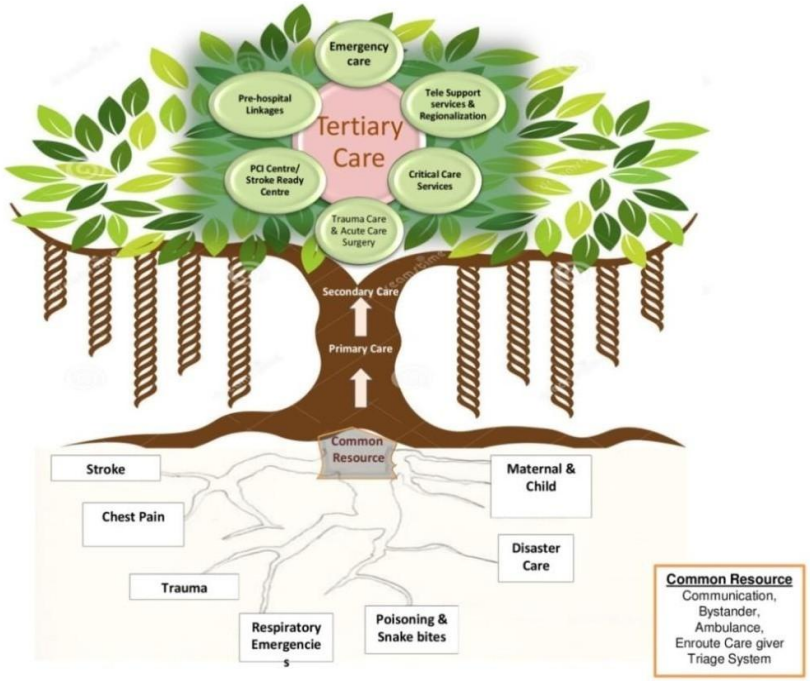
**Source: WHO info-graphics

Figure 4b: WHO Emergency Care System Framework (13)



**Source: WHO info-graphics

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



Patients may access any level of care directly

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 medicalservices.

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 requirementsfor emergencies, especially for obstetrics, have been used in various setting, especially in Africa. [33, 34]

AIMS & OBJECTIVES

AIMS AND OBJECTIVES

Primary Objective:

1. To assess current status of facility based Emergency and Injury care in government medical colleges & large private hospitals

Secondary Objective:

To assess the following:

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)
    c) Measures of Academic Emergency medicine departments

METHODOLOGY

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) andPrivate hospitals less than 300-bed strength (20).

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

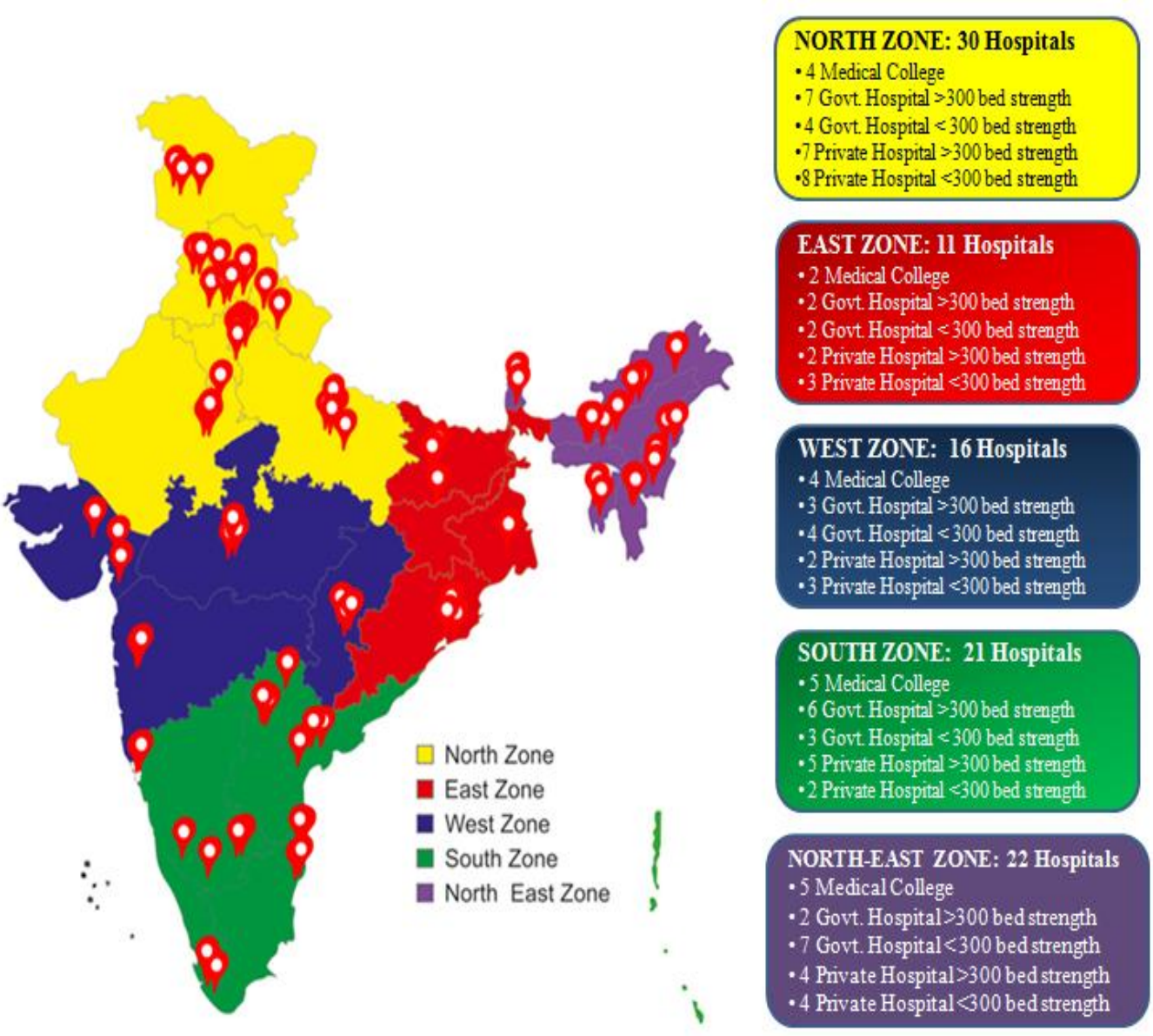
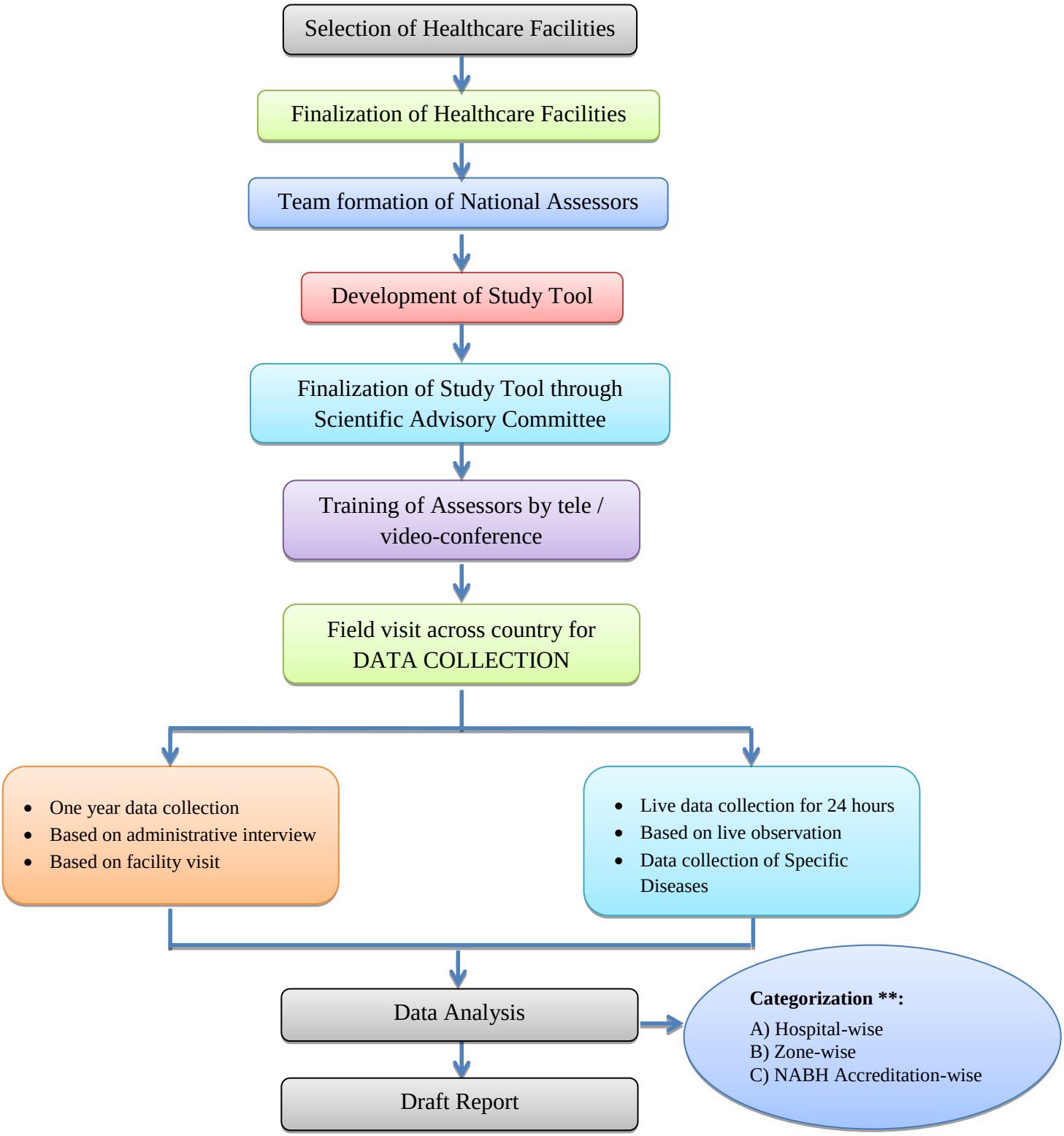


Figure 7a: Flow chart of Methodology



**where applicable

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 a total of 100 private and government healthcare facilities were randomly selected from each zone.

This cross-section study was undertaken in two phases:

1. Scientific Advisory Committee (SAC) 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 100 randomly selected healthcare facilities by a team of 3 assessors. The assessment was done by conducting 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 identified 100 healthcare facilities from five regions of the country and contacted the respective 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 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 Sri Sayaji General [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 acted 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.

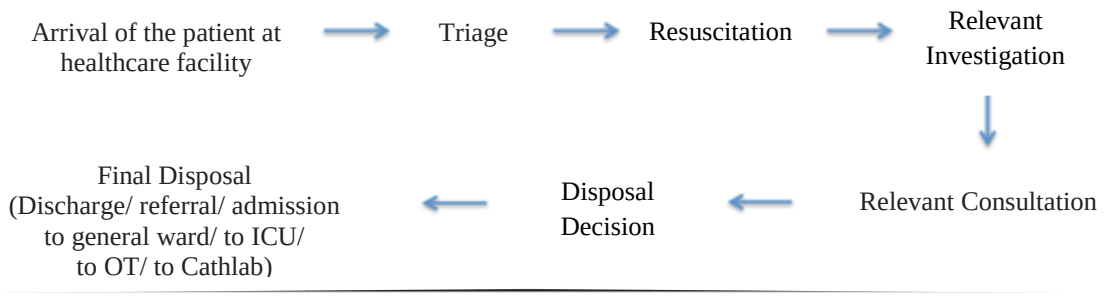
    b) Two other **Co-Assessors** were responsible for emergency department data collection by live observation (mainly assessing the emergency department processes & infrastructure [manpower, equipment, supplies, etc.]).

    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 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:

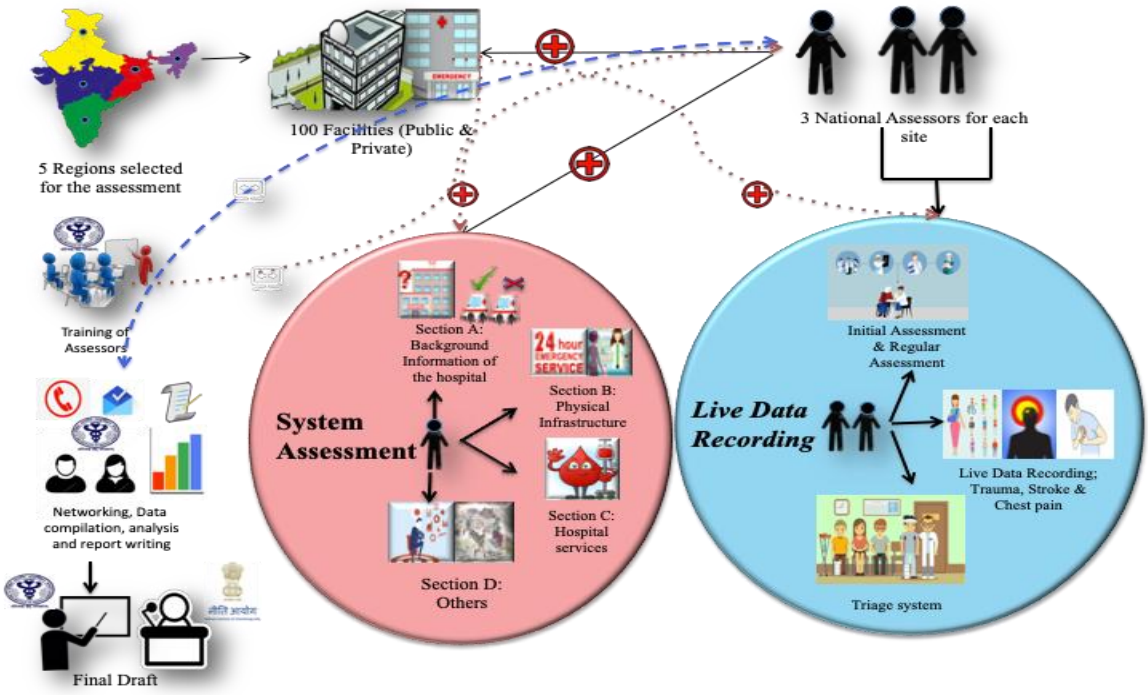


8. **Data analysis:** Data collected from the health-facilities was entered using a Microsoft Excel-based database. The analysis was done by using SPSS (Statistical Package for the Social Sciences). The level of analysis for the assessment is the facility, and for overall analysis it is category of the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

FIELD VISIT

(ADMINISTRATIVE INTERVIEW/ONE YEAR DATA COLLECTION)

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 100 hospitals studied, 20 hospitals were medical colleges (more than 500 bedded), 20 hospitals were government hospitals (more than 300 bedded), 20 hospitals were government hospitals (less than 300 bedded), 20 hospitals were private hospitals (more than 300 bedded) and 20 hospitals were private hospitals (less than 300 bedded).

Out of the 100 hospitals, NABH accredited hospitals were 28. There were only 5 hospitals that had academic emergency medicine out of all 100 hospitals. Among all the assessed hospitals, 25 were tertiary care government hospitals, 34 were secondary care (district) hospitals, 1 was secondary care (trust) hospital and 40 were private hospitals (20 tertiary and 20 secondary care hospitals).

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 100 hospitals, 32 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 / emergency department) for all categories of hospitals is shown in table 3 and represented in figure 8.

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

Categories of Healthcare Facilities	n	Emergency Department beds in Hospital Median [IQR] Min-Max	Total Inpatient beds in Hospital Median [IQR] Min-Max	% of Emergency Beds out of all Beds at ED
Medical Colleges (>500 bed strength)	20	46 [28] 10-210	1233[1147] 252-3500	3%
Govt. Hosp. (>300 bed strength)	20	17 [25] 2-183	418 [306] 200-1079	4%
Govt. Hosp. (<300 bed strength)	20	5 [6] 1-22	145 [182] 47-380	4%
Pvt. Hosp. (>300 bed strength)	19	15 [14] 5-44	467 [196] 150-1000	4%
Pvt. Hosp. (<300 bed strength)	19	10 [4] 3-15	200 [54] 48-400	5%

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

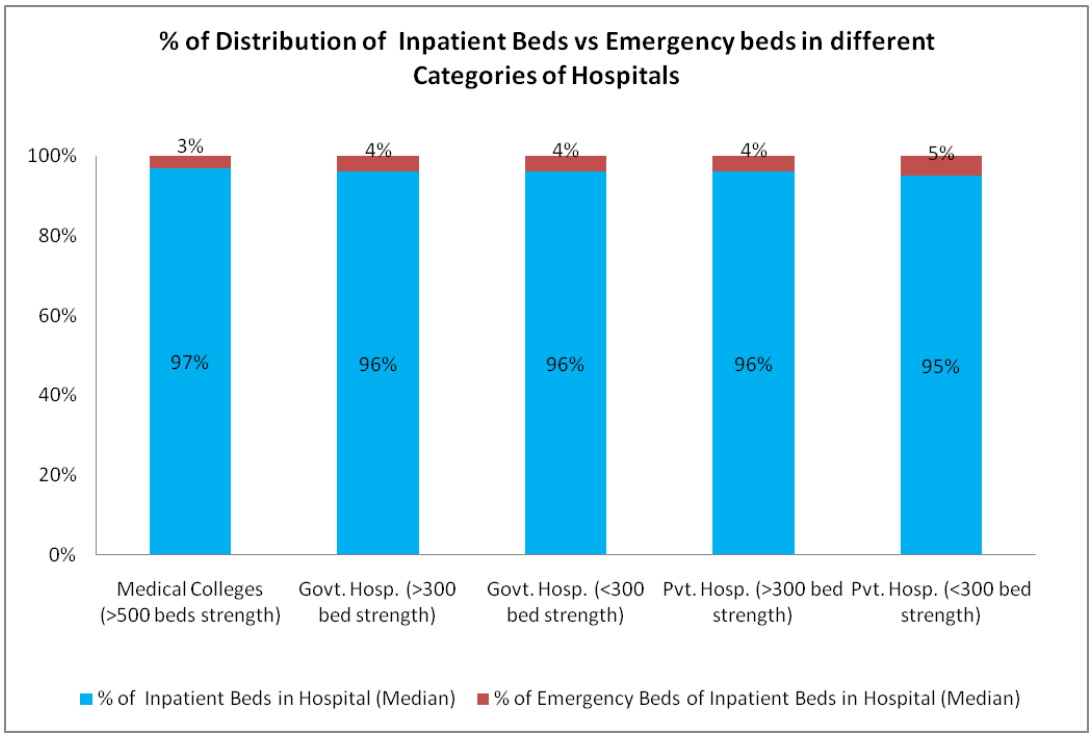
As mentioned in table 3, the percentage of beds in the emergency department accounted for 3% of all hospital beds in medical colleges, 4% in government hospitals (>300 beds strength), 4% in government hospitals (<300 beds strength), 4% in private hospitals (>300 beds strength) and 5% in private hospitals (<300 beds strength).

In medical colleges, maximum number of emergency beds was observed at JIPMER, Pondicherry (210 beds out of 2137 in-patient beds), while minimum number of emergency beds was observed at Tomo Riba Institute of Health & Medical Sciences, Papumpare (10 beds out of 252 in-patient beds).

In government hospitals (>300 beds), maximum number of emergency beds was observed at Indira Gandhi Government General Hospital, Pondicherry (183 beds out of 626 in-patient beds), while minimum was observed at District Hospital, Dhamtari (2 beds out of 200 in-patients beds).

In government hospitals (<300 beds), maximum number of emergency beds was observed at District Hospital, Ganderal (22 beds out of 200 in-patient beds), while minimum was observed at District Hospital, Bishnupur & District Hospital, Peren both had 1 bed out of 50 in-patients beds).

Figure 8: Overall representation of beds distribution in different categories of hospitals



The majority of hospitals did not have system for triage in their emergency department. Only 32 hospitals of all 100 hospitals had triage systems.

Systems for triage were present at 5 medical colleges *(Government General Hospital, Guntur; AIIMS, Bhopal; Rajiv Gandhi Government General Hospital, Madras Medical College; JIPMER, Pondicherry and IPGMER & SSKM Hospital)*, 4 government hospitals more than 300 beds, 14 private hospitals more than 300 beds, 9 private hospitals less than 300 beds and government hospitals less than 300 beds did not have any system for triage in their hospital emergency or emergency department.

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, 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 9). The annual burden of patients visited in emergency department of 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 in different Categories of Hospitals (1st Jan 2018 to 31st Dec 2018)

Categories of Healthcare Facilities	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	
Medical Colleges (>500 bed strength)	15	119461 [140435] 3560-477845	18	794860 [499481] 146000-3382591	13%
Govt. Hosp. (>300 bed strength)	17	43001 [118984] 4876-308883	17	435229 [447465] 22000-1463635	14%
Govt. Hosp. (<300 bed strength)	16	18738 [35140]1560-227364	18	224897 [145985] 44400-743278	15%
Pvt. Hosp. (>300 bed strength)	17	20861 [22118] 3676-103524	17	255000 [308000] 28278-749145	9%
Pvt. Hosp. (<300 bed strength)	11	13800 [4908] 3699-43304	12	94292 [53143] 7188-170938	12%

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

In medical college, the burden of patients in emergency as well as in OPD were maximum at SMS Medical College & Hospital and minimum at AIIMS, Bhopal (for emergency) and Regional Institute of Medical Sciences, Imphal (for OPD).

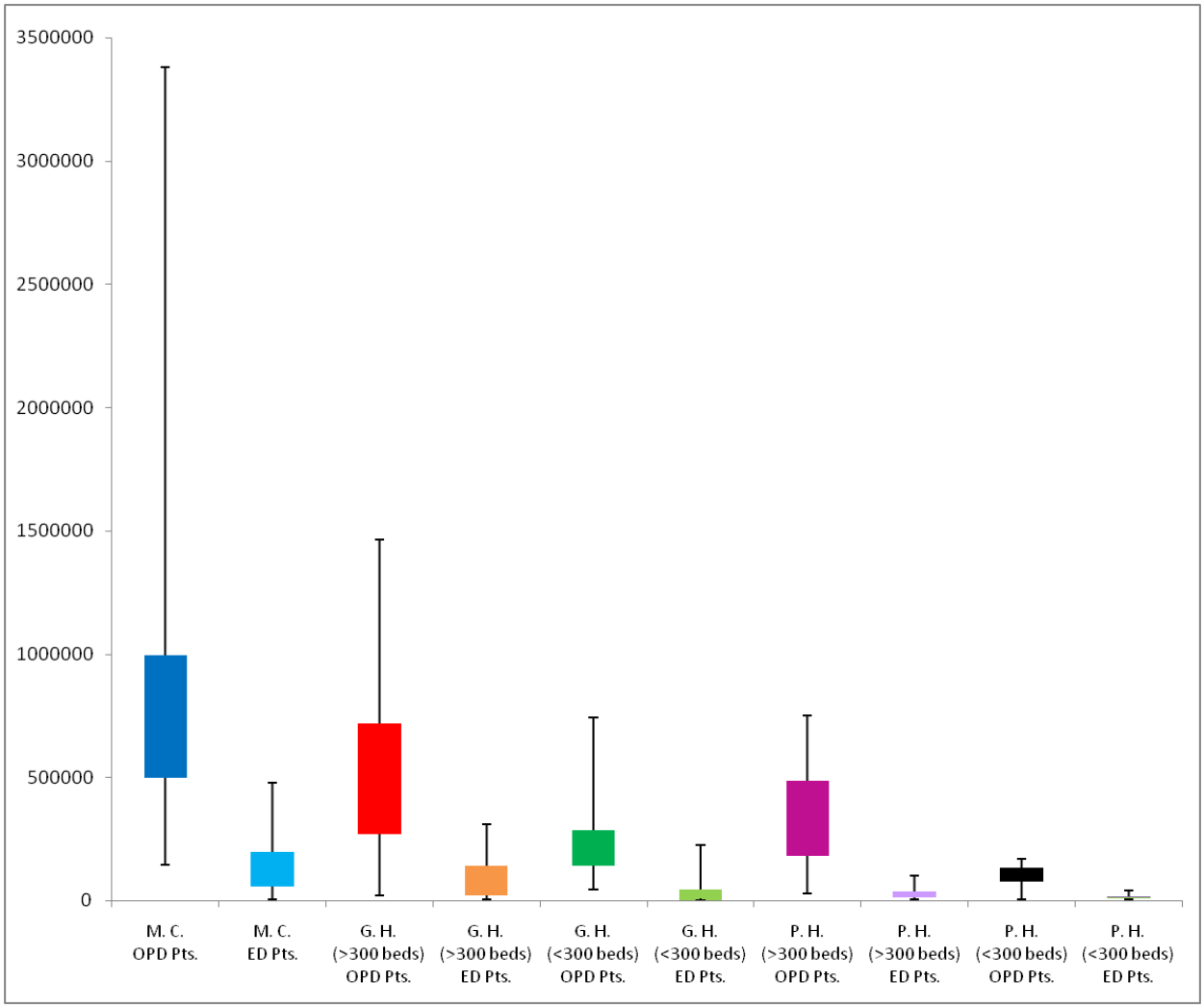
In government hospitals >300 beds, the burden of patients in emergency as well as in OPD were maximum at Indira Gandhi Government General Hospital, Puducherry and minimum at District Hospital, Dhamtari (for emergency) and Southern Railways Hospital, Chennai (for OPD).

In government hospitals <300 beds, the burden of patients in emergency were maximum at Puri District Headquarter Hospital and minimum at Sadar Hospital, Gaya; the burden of patients in OPD was maximum at Government BDM Hospital, Kotputli and minimum at District Hospital, Bishnupur, Manipur.

In private hospitals >300 beds, the burden of patients in emergency as well as in OPD were maximum at Dr Ram Manohar Lohia Hospital, Lucknow and minimum at GNRC, Guwahati, Assam. In private hospitals <300 beds, the burden of patients in emergency as well as in OPD were maximum at Ramakrishna Mission Hospital, Arunachal Pradesh and minimum at Medeor Hospital, Manesar.

The annual burden of patients who presented as emergency case, out of all patients visited the hospital for the year 2018 were: 13% in medical colleges, 14% in government hospitals with more than 300 beds, 15% in government hospitals with less than 300 beds, 9% in private hospitals with more than 300 beds and 12% in private hospitals with less than 300 beds.

Figure 9: Comparison of Patients visited in OPD and Emergency in different Categories of Hospitals (1st Jan 2018 to 31st Dec 2018)



*M. C.- Medical College, G. H.- Government Hospital, P. H.- Private Hospital, OPD- Out-patient Department

Data maintained regarding adult/pediatric patients were heterogenous across the studied hospitals. Only 43 hospitals maintained OPD data of adult patients and 37 hospitals maintained data of pediatric patients. Similarly, 36 hospitals maintained ED data of adult patients and 28 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) in different Categories of Hospitals (1st Jan 2018 to 31st Dec 2018)

Categories of Healthcare Facilities	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
Medical Colleges (>500 bed strength)	9	80418 [141265] 11961-347264	6	21849 [18019] 6429-130581	11	737333 [694550] 220097-2937193	10	61418 [37814] 8900-445398
Govt. Hosp. (>300 bed strength)	10	23671 [12983] 7495-281011	9	3650 [25872] 461-30204	10	384335 [194085] 21000-1388295	9	46812 [41308] 1000-127688
Govt. Hosp. (<300 bed strength)	6	11809 [41883] 836-150007	5	687 [550] 311-22688	7	149737 [129722] 5889-586632	6	23035 [19350] 1479-96725
Pvt. Hosp. (>300 bed strength)	7	14326 [18854] 3667-32304	6	2201 [3899] 225-13378	9	220631 [331418] 28278-872227	7	33106 [27192] 9293-52612
Pvt. Hosp. (<300 bed strength)	4	7555 [2234] 4800-8778	2	763 [248] 515-1011	6	67096 [19035] 30000-150534	5	10908 [11471] 3285-30431

*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 100 hospitals, 28 hospitals were following 0-12 years age for pediatric patients, 20 hospitals were following 0-14 years age, 10 hospitals were following 0-15 years age, 1 was following 0-16 years age, 11 were following 0-18 years age, and 30 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

Hospital Categories	% of Emergency and injury cases (One Year)	% of Emergency and injury cases (One Day)	% of Available Emergency Beds
Medical Colleges	13%	17%	3%
Govt. Hosp. (>300 bed strength)	14%	11%	4%
Govt. Hosp. (<300 bed strength)	15%	11%	4%
Pvt. Hosp. (>300 bed strength)	9%	10%	4%
Pvt. Hosp. (<300 bed strength)	12%	30%	5%

Different categories of hospitals have only 3-5% available emergency beds while the yearly burden of patients' ranges from 9 to 15%, which is much more than the available beds. It may be because the resources available in the healthcare facilities are either underutilized or over-utilized. By the above observation, it is clear that the optimum utilization of resources is missing in the hospitals.

The burden of emergency cases at medical college was high compared to both district hospitals and private hospitals. It may be because people are not utilizing secondary care hospitals due to lack of quality of care (lack of facilities present in district hospitals when compared to medical colleges).

About 65.9% populations belongs to rural areas (according to the World Bank collection of development indicators in 2018), most of the rural population cannot afford private hospitals due to high expenses.

As per current MCI guidelines, 35 emergency beds should be available in 500 bedded medical college i.e., 7% emergency beds. Table 8 A depicts the recommended number of beds per category of healthcare facility

1. For MBBS & PG Programme: To start PG programme, 7% emergency beds (below table) are sufficient, but to provide the quality emergency services this bed strength is less.

Table 7: Beds per centre as per MCI

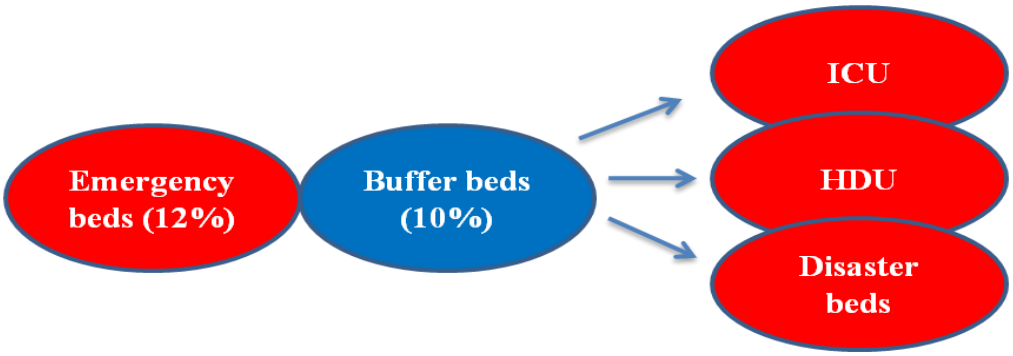
No. Of UG student intake	Minimum Total beds	ICU beds	"Red" category beds/Trolleys	"Yellow" category Beds/Trolleys	"Green" category beds/Trolleys	Triage beds/Trolleys (other than total beds/trolley)
50	30	6	4	15	5	3
100	35	7	5	16	7	3
150	40	8	6	18	8	4
200	45	9	7	20	9	4
>200	50 or above	10	8	22	10	5

2. For optimal care/services: To provide optimal emergency care services, we need to increase the number of emergency beds to **12% of all beds with addition of 10% as buffer beds based on footfall. S**econdly, 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-
    - Upgrading them to medical college
    - Developing residency programme in DNB: where in PG residents rotate regularly at district hospitals
    - Initiate programme based in centivization of government hospitals
3. Upgradation of medical colleges and district hospitals to cater the existing and expected footfall to provide quality service.

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.



5. Burden of Medico-legal Cases:

Table 8 summarizes the annual number of medico-legal cases attended in emergency of different categories of hospitals with median [IQR] and min-max. 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.

Table 8: Summary of Medico-legal cases attended at Emergency of different Categories of Hospitals

Hospital Categories	Medico-legal Cases		% of MLC = Total MLC / Total Emergency Pts.
	n	Median [IQR] Min-Max	
Medical Colleges	13	15473 [16719] 216-91354	8.7%
Govt. Hosp. (>300 bed strength)	18	2108 [4975] 87-23728	3%
Govt. Hosp. (<300 bed strength)	15	1230 [1598] 236-10049	6.4%
Pvt. Hosp. (>300 bed strength)	14	794 [1449] 257-2986	3.6%
Pvt. Hosp. (<300 bed strength)	13	498 [927] 71-1500	2.5%

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

In medical colleges, maximum medico-legal cases in emergency were at Patna Medical College & Hospital and minimum at New STNM Hospital, Sikkim.

In government hospital >300 beds, maximum medico-legal cases in emergency were at District Hospital, Karim Nagar, Telangana and minimum at AIIMS, Patna.

In government hospital <300 beds, maximum medico-legal cases in emergency were at North Goa District Hospital, Goa and minimum at District Hospital, Ganderbal.

In private hospital >300 beds, maximum medico-legal cases in emergency were at Dr Ram Manohar Lohia Hospital, Lucknow and minimum at Cosmopolitan Hospitals Private Limited, Kerala.

In private hospital <300 beds, maximum medico-legal cases in emergency were at Ruby General Hospital, West Bengal and minimum at G G Hospital, Kerala.

Majority of district hospitals make more MLC's when compared to medical college and private hospitals. In district hospitals a dedicated CMO (Chief Medical Officer) is present, who makes MLC cases. Preparation of MLC reports adds to the existing mandate of providing quality acute care service by the emergency care provider.

Burden of Medico-legal cases on Emergency Department ranging between 2%-9%

Suggestions for MLC:

These findings suggest higher burden of MLC's at government hospitals. Amongst government hospitals, the load is highest at medical colleges. Private hospital seems to have a disproportionally lean load of MLC.

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

1. Ensure equitable distribution for MLC related services among both government and private sector.
2. Dedicated EMO (Emergency Medical Officer) / Senior Resident (Forensic Medicine) to deal with MLC documentation and representation to court.
3. Develop cadre of Forensic Nursing and post them in the emergency for round the clock frontline medico-legal service.
4. 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:

In addition, table 9 summarizes the annual number of admissions through emergency at different categories of hospitals.

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

Table 9: Summary of Admissions through Emergency Department at different Categories of Hospitals

Hospital Categories	Admissions through Emergency		% of patients admitted of those visiting ED
	n	Median [IQR] Min-Max	
Medical Colleges	14	31487 [23267] 552-80315	22.2%
Govt. Hosp. (>300 bed strength)	15	6591 [13936] 373-55293	19.4%
Govt. Hosp. (<300 bed strength)	12	1269 [4969] 147-227364	23.8%
Pvt. Hosp. (>300 bed strength)	16	9877 [6749] 195-31899	31%
Pvt. Hosp. (<300 bed strength)	14	4020 [4721] 1236-9834	39%

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

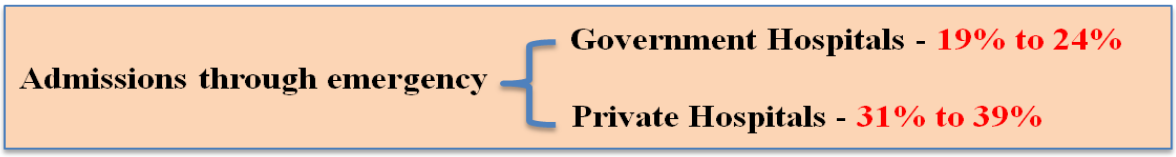
In medical college, maximum number of admissions through emergency was at Government Medical College, Thiruvananthapuram and minimum at AIIMS, Bhopal.

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

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

In private hospital >300 beds, maximum admissions through emergency was at Dr Ram Manohar Lohia Hospital, Lucknow and minimum at Central referral Hospital, Sikkim.

In private hospital <300 beds, maximum admissions through emergency was at Jaipur Golden Hospital, Delhi and minimum at Ruban Memorial Hospital, Bihar.



Suggestions:

The number of admissions through emergency was high in district hospitals>300 beds than medical colleges but they have less number of emergency beds to cater the existing footfall.

1. NABH Accreditation
2. District hospitals admits more patients in emergency than medical college, so
    - Upgrade them into medical college
    - Develop residency programme for emergency medicine

7. Burden of Death of Trauma Patients:

Table 10 depicts the annual number of death of trauma patients in emergency of different categories of hospitals. It was compared with the total number of trauma patients (one day) visited in emergency of all hospitals.

Table 10: Summary of Death of Trauma Cases in Emergency by Categories of Hospitals

Categories of Healthcare Facilities	Death of Trauma Patients (ONE YEAR)		Number of Trauma Patients visited in Emergency (ONE DAY)		
	n	Median [IQR] Min-Max	n	Total Pts in one day	Median [IQR] Min-Max
Medical Colleges (>500 bed strength)	11	266 [1172] 40-8067	15	599	18 [25] 1-210
Govt. Hosp. (>300 bed strength)	8	12 [35] 1-234	18	175	5 [11] 1-45
Govt. Hosp. (<300 bed strength)	9	8 [23] 1-66	19	130	5 [6] 1-40
Pvt. Hosp. (>300 bed strength)	9	14 [26] 2-206	18	143	3 [10] 1-35
Pvt. Hosp. (<300 bed strength)	7	3 [37] 2-797	17	60	3 [4] 1-20

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

Death of trauma patients was high in medical college when compared to other categories of hospitals. 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 department.

Suggestion:

Develop a robust integrated emergency care system which includes injuries

8. Burden of Patient's Death due to Road traffic Injury:

Table 11 depicts the annual number of patient's death due to road traffic injury in emergency of different hospital categories.

Table 11: Summary of Patient's Death due to Road Traffic Injury by Categories of Hospitals

Categories of Healthcare Facilities	Patient's Death due to Road Traffic Injury	
	n	Median [IQR] Min-Max
Medical Colleges (>500 bed strength)	8	171 [527] 1-1013
Govt. Hosp. (>300 bed strength)	10	21 [81] 1-1042
Govt. Hosp. (<300 bed strength)	5	11 [26] 11-37
Pvt. Hosp. (>300 bed strength)	10	6 [19] 1-703
Pvt. Hosp. (<300 bed strength)	7	6 [63] 2-324

*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 12 summarizes the annual number of brought dead patients in emergency of different hospital categories with median [IQR] and min-max.

Table 12: Summary of Brought Dead Patients in Emergency by Different Category of Hospitals

Categories of Healthcare Facilities	Brought Dead Patients	
	n	Median [IQR] Min-Max
Medical Colleges (>500 bed strength)	7	204 [137] 3-618
Govt. Hosp. (>300 bed strength)	11	129 [170] 23-708
Govt. Hosp. (<300 bed strength)	8	23 [24] 3-159
Pvt. Hosp. (>300 bed strength)	11	70 [105] 5-733
Pvt. Hosp. (<300 bed strength)	8	25 [91] 1-165

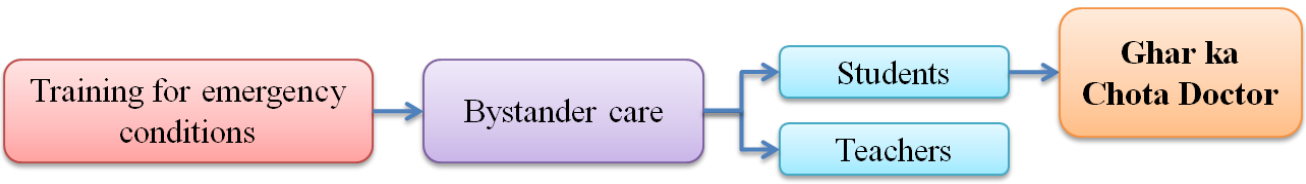
*n: total number of hospitals which shared data with assessor's team, IQR: Interquartile range

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 and strengthen preventive emergency healthcare strategy such as N**ational Injury Prevention Programme**
2. Develop a **robust pre-hospital emergency care system including community participation.**



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

10. Blood Bank Services:

Table 13 summarizes the hospital blood bank services for all categories of hospitals. As per the assessment, 69 hospitals out of 100 had licensed in-house blood bank, out of which 66 hospitals ran 24 X 7 services.

It was observed that 34 hospitals had a tie-up with an external blood bank facility, 57 hospitals had separate component facility for packed cell (RBC), FFP, Platelet Cryoprecipitate, 57 hospitals had availability of O- (Negative) blood in their hospitals (figure 10).

A) Hospital-wise comparison:

It was observed that out of 20 medical colleges 18 had 24*7 blood bank service available in hospital but one medical college *(Tomo Riba Institute of Health & Medical Sciences, Papumpare)* did not have 24*7 blood bank facility while one medical college *(B J Medical College & Sassoon General Hospital, Pune)* did not have in-house blood bank available but it had tie-up with other blood bank.

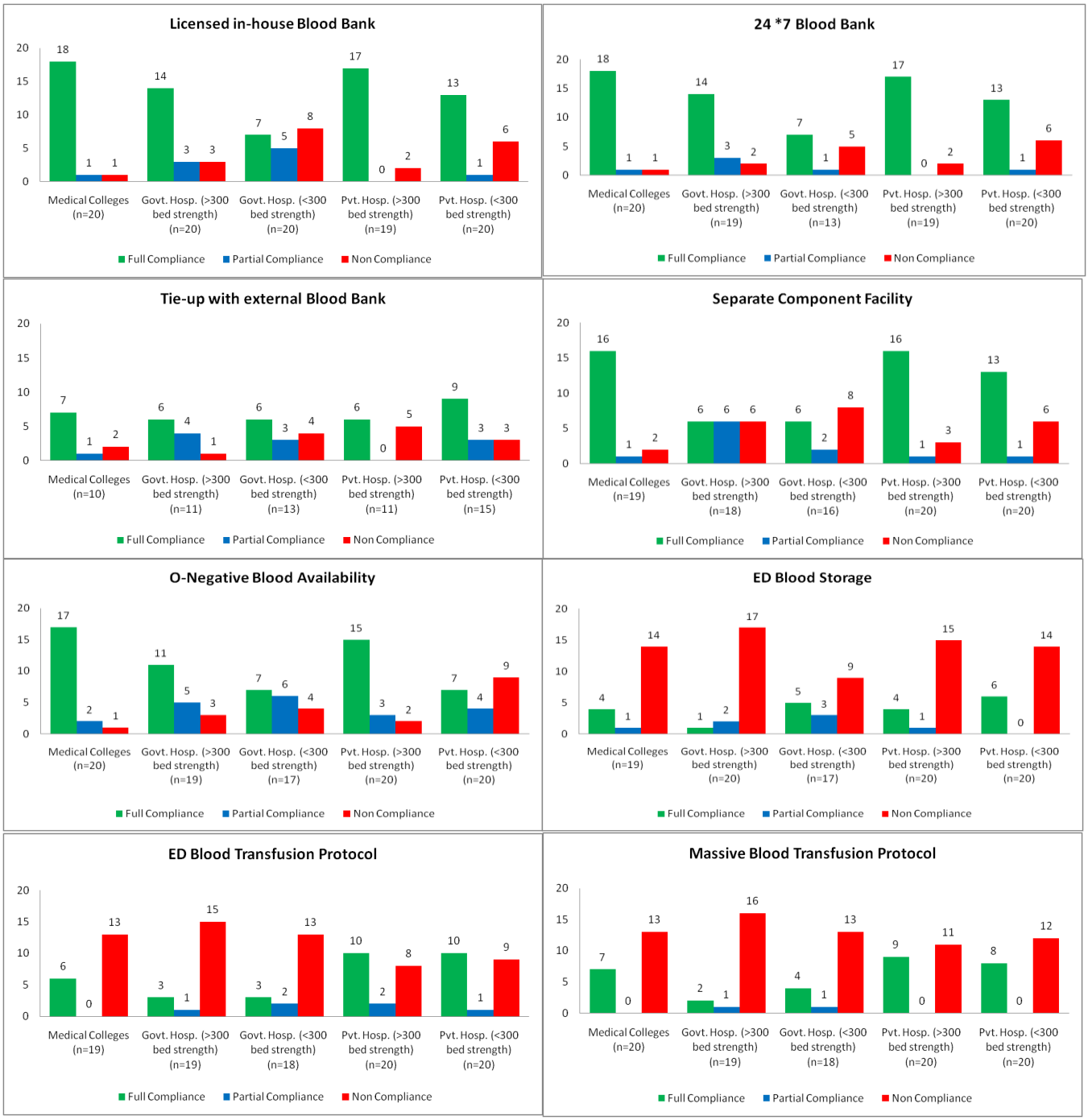
Table 13: Summary of Hospital Blood Bank Services by Categories of Hospitals

Hospital Blood Bank Services	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	FC	PC	NC	FC	PC	NC	FC	PC	NC	FC	PC	NC	FC	PC	NC
Licensed in-house Blood Bank	18	1	1	14	3	3	7	5	8	17	0	2	13	1	6
24*7 Blood Bank	18	1	1	14	3	2	7	1	5	17	0	2	13	1	6
Tie up with external blood bank	7	1	2	6	4	1	6	3	4	6	0	5	9	3	3
Separate Component Facilities	16	1	2	6	6	6	6	2	8	16	1	3	13	1	6
O Negative Blood Availability	17	2	1	11	5	3	7	6	4	15	3	2	7	4	9
ED Blood Storage	4	1	14	1	2	17	5	3	9	4	1	15	6	0	14
ED Blood Transfusion Protocol	6	0	13	3	1	15	3	2	13	10	2	8	10	1	9
Massive Blood Transfusion Protocol	7	0	13	2	1	16	4	1	13	9	0	11	8	0	12

**FC: Full Compliance, PC: Partial Compliance, NC: Non-Compliance, ED: Emergency department

Out of 100 hospitals, 11 hospitals (Christian Institute of Health Sciences & Research, Dimapur; District Hospital, Ganderbal; District Hospital Bishnupur; Shija Hospital & Research Institute, Imphal; Birla CK Hospital, Jaipur; Fortis Hospital, Jaipur; Civil Hospital, Sec-22, Chandigarh; Bhopal Fracture Hospital, Bhopal; Sadar Hospital, Gaya; Paras HMRI Hospital, Bihar and Coronation Hospital, Dehradun)were found which neither has in-house licensed blood bank nor has any tie-up with external blood bank facility.

Figure 10: Comparison of Hospital Blood Bank Services in Hospital Categories



The blood bank is under construction in Christian Institute of Health Sciences & Research, Dimapur and District Hospital Bishnupur, while District Hospital, Ganderbal has only blood storage. District Hospital, Dhamtari reported shortage of staff for blood bank.

****Blood Bank in the ED:**

It was observed that the majority of hospitals did not have facilities for storage of blood at ED. Only 20 hospitals {10 government hospitals [6 district hospitals and 4 medical colleges], 10 private hospitals} had separate blood storage for ED.

Most of the hospitals did not have protocols for massive blood transfusion and ED blood transfusion (Figure 10).

Best Practices for Blood Bank Services:

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

6district 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

Only 4 medical colleges had separate blood storage for ED:

- B J Medical College, Pune
- SMS Medical College & Hospital, Rajasthan
- Patna Medical College & Hospital, Bihar
- IPGMER & SSKM Hospital

District Hospital, Baramulla
ED Blood Storage

Suggestions:

1. Blood bank services for 24*7 at all hospitals.
2. **Blood storage facilities in the ED should be made mandatory for those medical college and district hospitals (>300 beds) which deals with high volume major trauma cases, emergency conditions requiring lifesaving blood transfusion services (e.g Massive upper/lower gastrointestinal bleed, Massive hemoptysis, severe anaemia).**

B) Zone-wise comparison:

Table 14and figure 11 summarizes the blood bank services for hospitals in different zones of India.

Figure 11: Zone-wise Comparison of Hospital Blood Bank Services

It was observed that 5 hospitals in north zone neither had blood bank facility in hospital nor had any tie-up with other blood bank. Similarly, 2 hospitals in east zone and 4 hospitals in

north east neither had blood bank facility in hospital nor had any tie-up with other blood bank. The assessed hospitals of south zone and west zone had 24*7 available blood bank facilities either in their hospital or had some tie-up with another blood bank facility.

Table 14: Zone-wise Summary of Hospital Blood Bank Services

Hospital Blood Bank Services	North (n=30)			South (n=21)			East (n=11)			West (n= 16)			North East (n=22)		
	NC	PC	FC	NC	PC	FC	NC	PC	FC	NC	PC	FC	NC	PC	FC
Licensed in-house Blood Bank	4	3	23	4	0	16	4	2	5	4	1	11	4	4	13
24*7 Blood Bank	3	0	26	3	1	15	2	1	6	2	2	10	6	3	13
Tie up with external blood bank	6	3	12	4	1	6	1	1	4	0	3	3	4	3	8
Separate Component Facilities	8	3	17	3	2	15	3	2	4	4	2	9	8	2	10
O-ve Blood Availability	6	6	18	2	2	16	1	5	3	4	2	9	7	4	10
ED Blood Storage	22	1	7	13	2	4	4	2	3	9	3	3	20	0	2
ED Blood Transfusion Protocol	18	1	10	10	1	8	4	2	4	7	2	6	18	1	3
Massive Blood Transfusion Protocol	19	1	9	11	1	8	7	0	3	8	1	6	19	0	3

******FC: Full Compliance, PC: Partial Compliance, NC: Non-Compliance, ED: Emergency Department

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:

It was observed that 53% hospitals had emergency operative services for trauma patients, 58% hospitals had emergency operative services for non-trauma patients, 57% hospitals had emergency operative services for obstetrics patients, 61% hospitals had emergency operative services for orthopedic patients, and 47% hospitals had emergency operative services for neurosurgical patients (table 15 and figure 12).

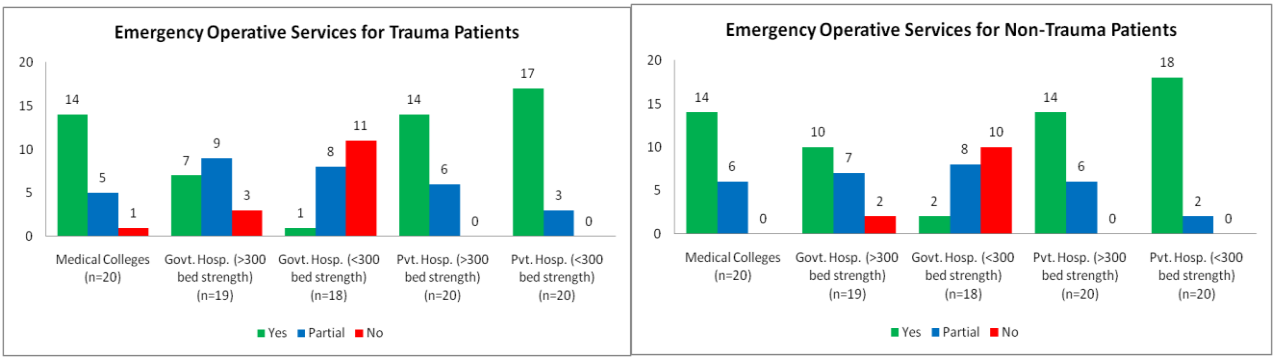
In addition, only 14 medical colleges had emergency operative services for trauma patients, 5 medical colleges showed partial compliance while one medical college (New STNM Hospital, Sikkim) did not had emergency operative services for trauma patients. Also, 4 medical colleges (Guru Nanak Dev Hospital, GMC, TRIHMS, New STNM Hospital and Patna Medical College) did not have emergency operative services for neurosurgical patients.

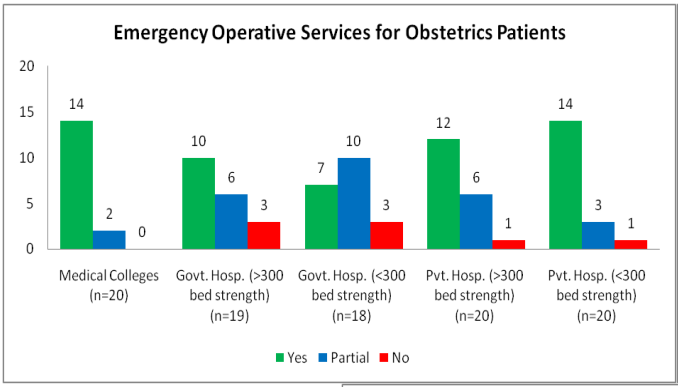
Table 15: Overall Summary of Emergency Operative Services by Hospital Category

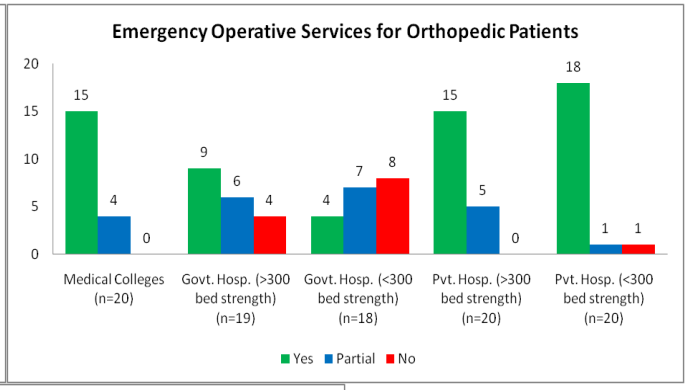
Emergency Operative Services	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt.hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
For Trauma pts	14	5	1	7	9	3	1	8	11	14	6	0	17	3	0
For Non-Trauma pts	14	6	0	10	7	2	2	8	10	14	6	0	18	2	0
For Obstetrics pts	14	2	0	10	6	3	7	10	3	12	6	1	14	3	1
For Orthopedic pts	15	4	0	9	6	4	4	7	8	15	5	0	18	1	1
For Neurosurgical pts	13	2	4	4	3	10	0	3	16	14	3	2	16	2	1

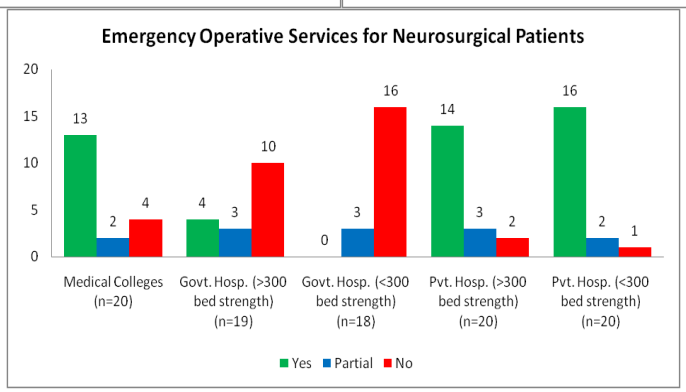
*n: total number of assessed hospitals

Figure 12: Comparison of Hospital Emergency Operative Services in Hospital Categories









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.

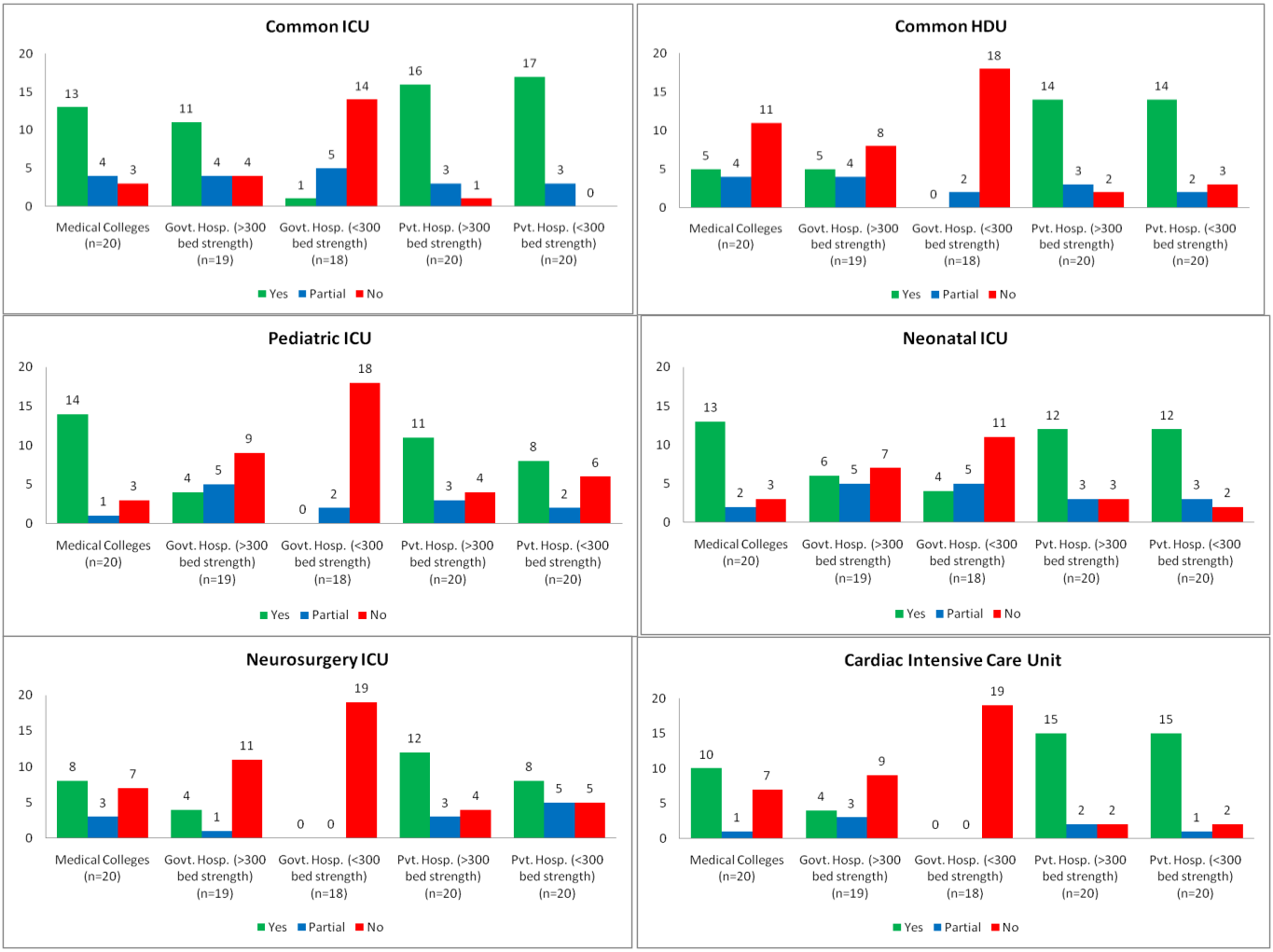
Table16: Overall Summary of Critical Care Services by Hospital Category

Definitive Care Services	Medical Colleges (n=20)			Govt. Hospitals (>300 bed strength) (n=20)			Govt. Hospitals (<300 bed strength) (n=20)			Pvt. Hospitals (>300 bed strength) (n=20)			Pvt.Hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Common ICU	13	4	3	11	4	4	1	5	14	16	3	1	17	3	0
Common HDU	5	4	11	5	4	8	0	2	18	14	3	2	14	2	3
Pediatric ICU	14	1	3	4	5	9	0	2	18	11	3	4	8	2	6
Neonatal ICU	13	2	3	6	5	7	4	5	11	12	3	3	12	3	2
Neurosurgical ICU	8	3	7	4	1	11	0	0	19	12	3	4	8	5	5
Cardiac ICU	10	1	7	4	3	9	0	0	19	15	2	2	15	1	2

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

In this study, different types of ICUs were assessed. It was observed that majority of hospitals did not had any common ICU as well as specialized types of ICU in their hospitals. A total of 58% hospitals had common ICU, 38% had common HDU (High Dependency Unit), 37% hospitals had pediatric ICU, 47% hospitals had neonatal ICU, only 32% hospitals had neurosurgery ICU, and 44% hospitals had cardiac ICU were observed (table 16 and figure 13).

Figure 13: Comparison of Hospital Critical Care Services by Category of Hospital



It was observed that 20 out of 3 medical colleges (TRIHMS, Sher-i-kashmir Institute of medical Sciences and Patna medical College) did not have common ICU. 3 medical colleges (Guru Nanak Dev Hospital, GMC, TRIHMS, and New STNM Hospital) did not have pediatric ICU and 3 medical colleges (Sher-i-kashmir Institute of medical Sciences, New STNM Hospital and IGMC, Shimla) did not have neonatal ICU.

iii) Specialized Care Services

Other than ICU, hospitals have some specialized care services, which were also assessed. It was observed that 43% hospitals had cardiac cath lab, 28% hospitals had intervention radiology, only 17% hospitals had intervention neuroradiology service with DSA, 26% hospitals had facility for emergency CABG services, and only 18% hospitals had facility for radiofrequency ablation services (table 17 and figure 14).

Figure 14: Comparison of Hospital Specialized Care Services by Category of Hospitals

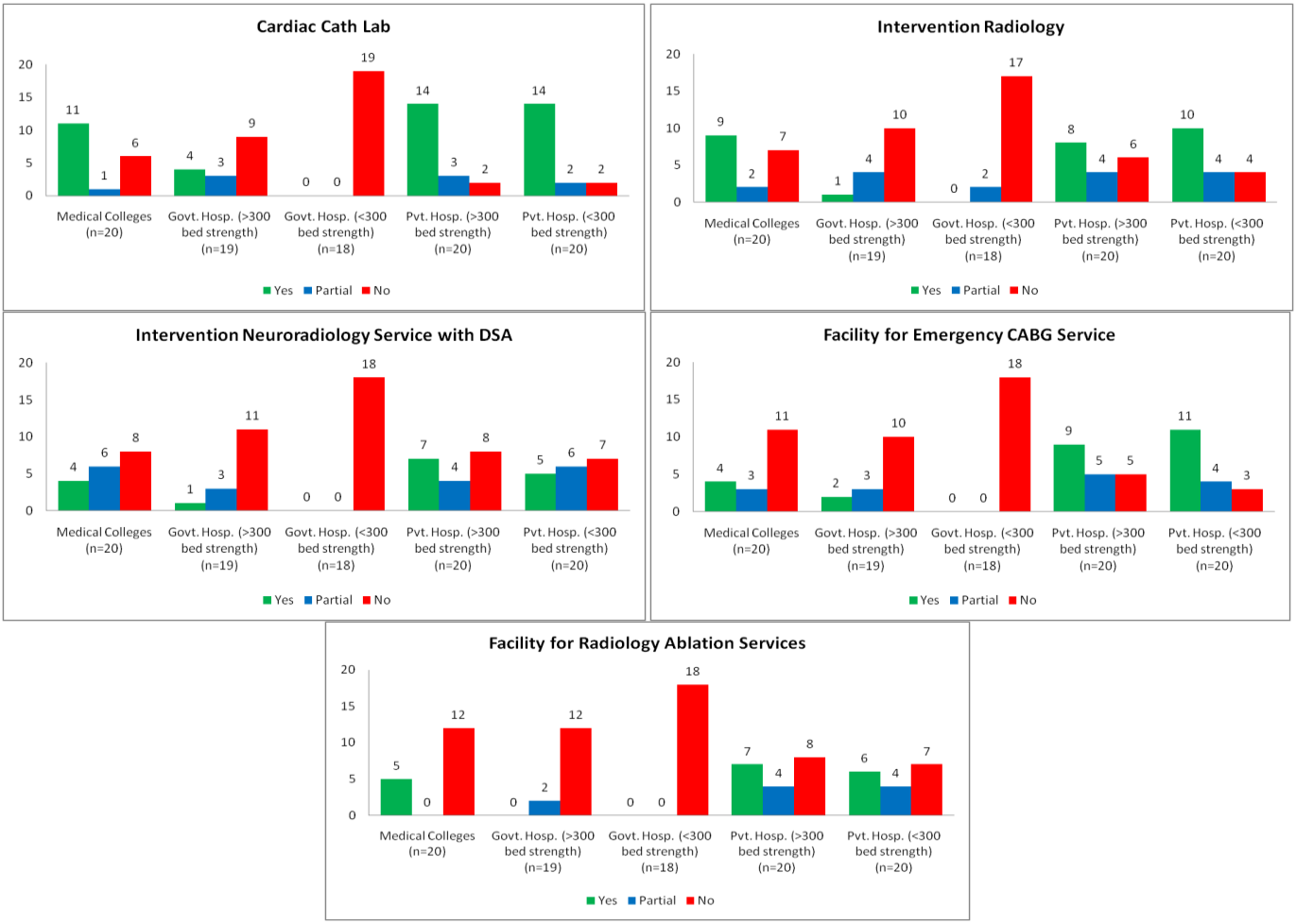


Table 17: Overall Summary of Specialized Care Services by Hospital Category

Specialized Care Services	Medical Colleges (n=20)			Govt. Hospitals (>300 bed strength) (n=20)			Govt. Hospitals (<300 bed strength) (n=20)			Pvt. Hospitals (>300 bed strength) (n=20)			Pvt. Hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Cardiac Cath Lab	11	1	6	4	3	9	0	0	19	14	3	2	14	2	2
Intervention Radiology	9	2	7	1	4	10	0	2	17	8	4	6	10	4	4
Intervention Neuro Radiology with DSA	4	6	8	1	3	11	0	0	18	7	4	8	5	6	7
Facility for Emergency CABG Service	4	3	11	2	3	10	0	0	18	9	5	5	11	4	3
Facility for Radiofrequency Ablation Service	5	0	12	0	2	12	0	0	18	7	4	8	6	4	7

*n: total number of assessed hospitals

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:

1. *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*

Best Practices for Overall Definitive Care Services:

- *Overall the following hospitals had all compliance for defined definitive care services, best practices were observed in Grant Medical Foundation Ruby Hall Clinic, Shija Hospital & Research Institute, Manipal Hospital, Max Super Speciality hospital, Ramakrishna Care Hospital and Primus Super Speciality hospital.*
- *These hospitals had all types of emergency operative services, all types of ICU and every specialized care services were observed in the above mentioned hospitals.*

Suggestions:

1. Medical colleges should have all types of emergency operative, critical care and specialized care services for 24*7.
2. 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).
3. 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.

12. Ambulance Services:

12.1 Available ambulances in hospitals:

A) Hospital-wise comparison:

A total of 378 ambulances were recorded in 100 hospitals, out of which 315 were functional, 31 were non-functional and the data of 32 ambulances were not known.

Out of the 315 functional ambulances, 148 ambulances were ALS (Advanced Life Support), 97 ambulances were BLS (Basic life Support), and 70 ambulances were neither ALS nor BLS (other transport vehicles).

Table18: Summary of available Ambulances by Hospital Category

Ambulance Services	Medical Colleges (n=20)	Govt. hospitals (>300 bed strength) (n=20)	Govt. hospitals (<300 bed strength) (n=20)	Pvt. hospitals (>300 bed strength) (n=20)	Pvt. hospitals (<300 bed strength) (n=20)
Total Ambulances	**119**	**56**	**54**	**91**	**58**
Functional	86 (72%)	37 (66%)	47 (87%)	91 (100%)	54 (93%)
ALS	*38 (44%)*	*21 (57%)*	*17 (36%)*	*40 (44%)*	*32 (59%)*
BLS	*24 (28%)*	*6 (16%)*	*6 (13%)*	*45 (49%)*	*16 (30%)*
Other Transport Vehicles	*24 (28%)*	*10 (27%)*	*24 (51%)*	*6 (7%)*	*6 (11%)*
Non-Functional	16 (13%)	5 (9%)	7 (13%)	0 (0%)	3 (5%)
Data Not Known	17 (14%)	14 (25%)	0 (0%)	0 (0%)	1 (2%)

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

Figure 15: Representation of available Ambulances Status by Category of Hospitals

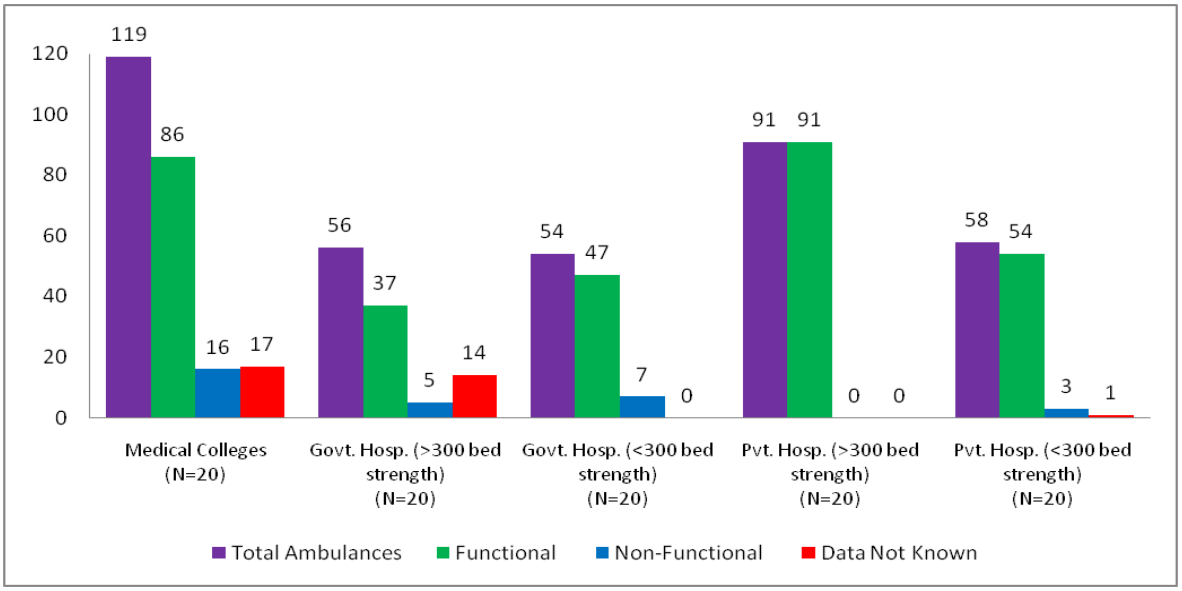
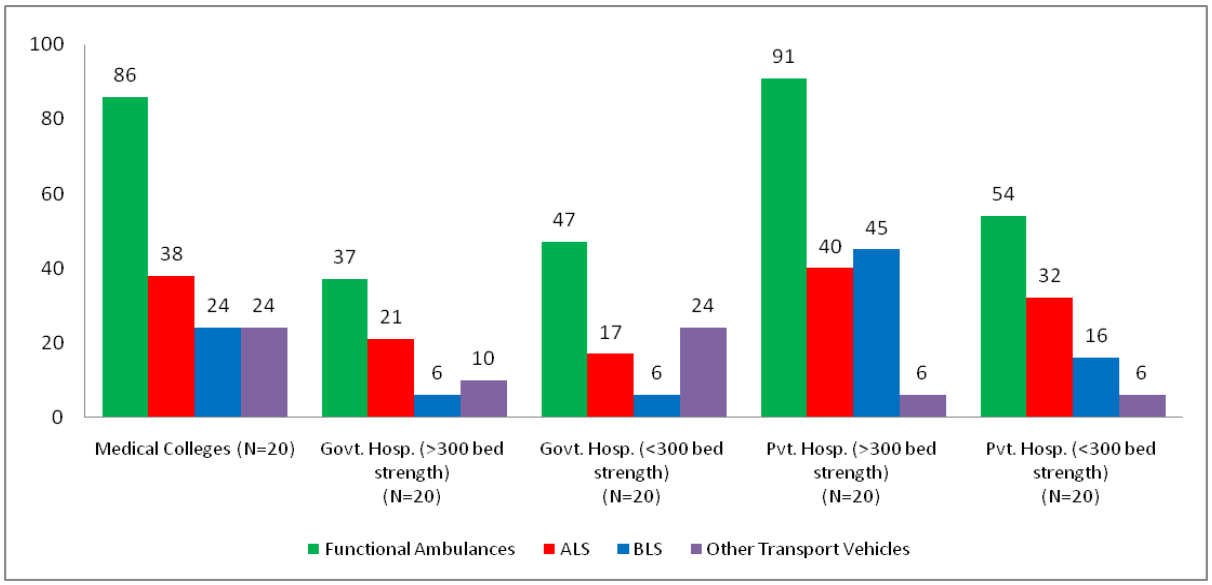


Figure 16: Representation of types of Ambulances by Category of Hospitals



It was observed that ~48% of the ambulances were ALS of all the functional ambulances in every category of hospital, and only 10% patients (red triaged patients) require ALS ambulances.

B) Zone-wise comparison:

A total of 136 ambulances were found in north zone (n= 30), 82 ambulances were found in south zone (n=21), 31 ambulances were found in east zone (n=11), 64 ambulances were found in west zone (n=16), and 65 ambulances were found in north-east zone (n=22) of India (table 19 and figure 17, 18).

Table 19: Zone-wise Summary of available Ambulances in Hospitals

Hospital Ambulance Services	North (n=30)	South (n=21)	East (n=11)	West (n=16)	North East (n=22)
Total Ambulances	**136**	**82**	**31**	**64**	**65**
Functional	103 (76%)	69 (84%)	29 (94%)	55 (86%)	59 (91%)
ALS	*33 (24%)*	*39 (48%)*	*17 (55%)*	*34 (53%)*	*25 (38%)*
BLS	*35 (26%)*	*25 (30%)*	*8 (26%)*	*18 (28%)*	*11 (17%)*
Other Transport Vehicles	*68 (50%)*	*18 (22%)*	*6 (19%)*	*12 (19%)*	*29 (45%)*
Non-Functional	6 (4%)	9 (13%)	2(7%)	9 (16%)	5 (8%)
Data Not Known	27 (20%)	4 (5%)	0 (0%)	0 (0%)	1 (2%)

Good Practice by using Bike Ambulance:

It was found that ***Max Super Speciality Hospital, Chandigarh*** has 2 functional bike ambulances which were used for patient transport.

Figure 17: Zone-wise Comparison of available Ambulances in Hospitals

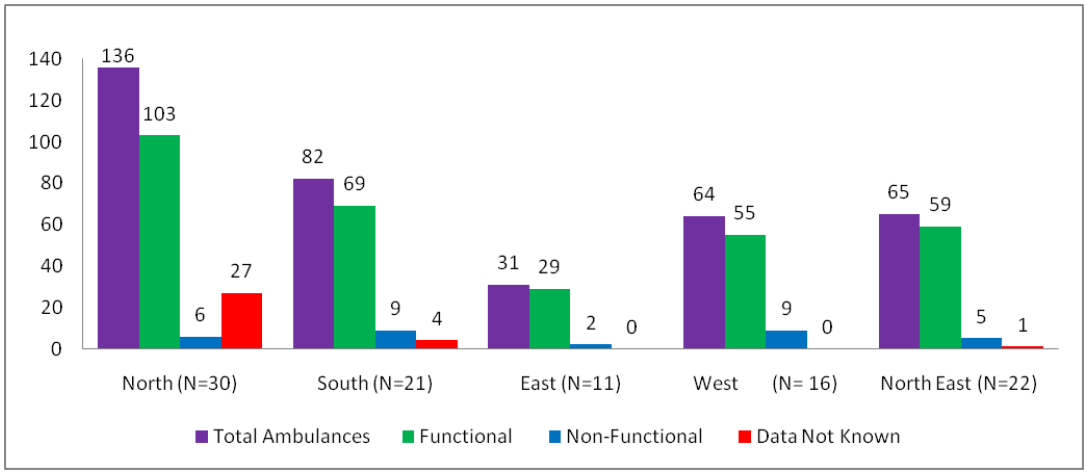
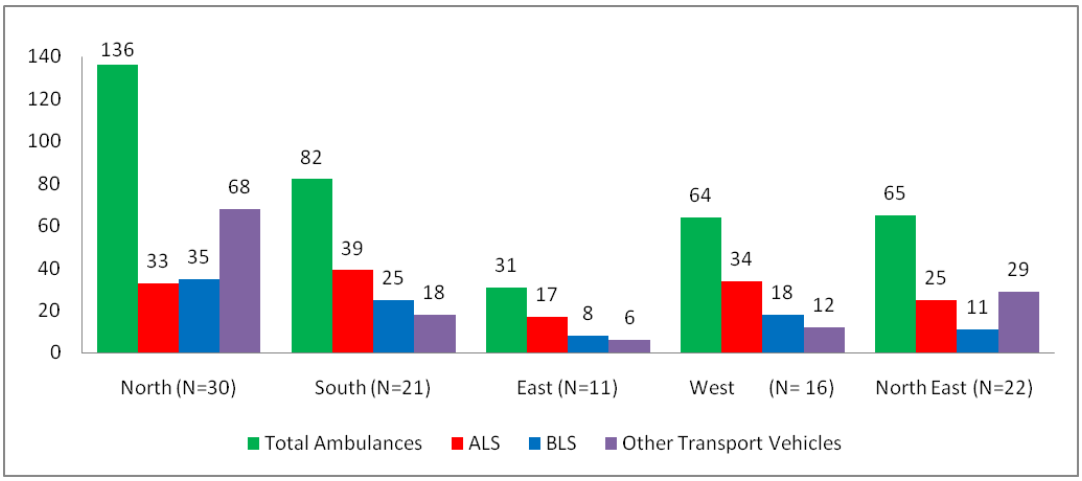


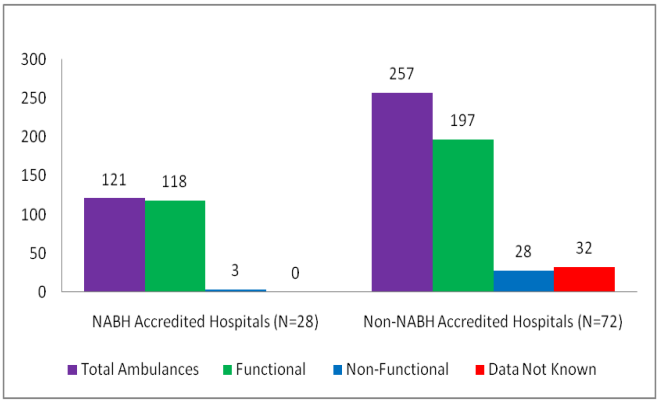
Figure 18: Zone-wise Comparison of types of Ambulances in Hospitals



C) NABH Accreditation-wise comparison:

Table 20 and figure 19summarizes the number of ambulances on the basis of hospitals with NABH accreditation and hospitals without NABH accreditation.

Figure 19: Comparison of available Ambulances with their types in NABH Accredited Hospitals and Non-NABH Accredited Hospitals



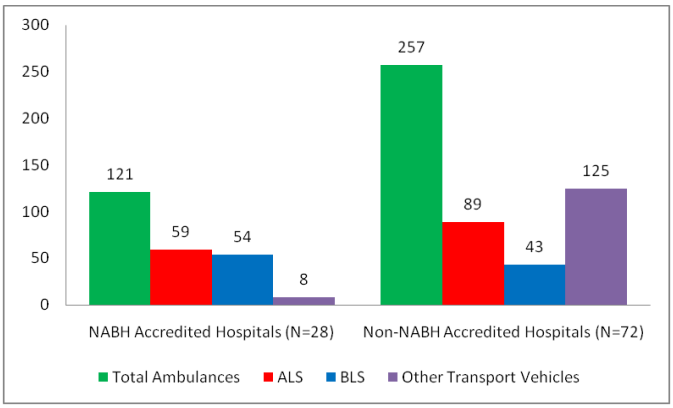


Table 20: Summary of available Ambulances in NABH accredited and non-NABH Accredited Hospitals

Hospital Ambulance Services	NABH Accredited Hospitals (n=28)		Non-NABH Accredited Hospitals (n=72)	
Total Ambulances	121	32%	257	68%
Functional	118	98%	197	77%
ALS	*59*	*49%*	*89*	*35%*
BLS	*54*	*45%*	*43*	*17%*
Other Transport Vehicles	*8*	*7%*	*125*	*49%*
Non-Functional	3	2%	28	11%
Data Not Known	0	0%	32	12%

*n: number of hospitals

Suggestions:

- As per MCI, number of in-hospital ambulances according to bed strength:
  1. For > 300 beds, 1 ambulance should be present
  2. For > 500 beds, 2 ambulances should be present

- The in-hospital ambulances should be optimally utilized in the **common resource poolof EMS** (Emergency medical Service) of the region as per requirement.
- Regular maintenance of ambulances should be done.
- 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 100 hospitals, 91 had in-house ambulances. Only 18% hospitals get a pre-hospital notification of ambulance arrival at the hospital. Trained paramedics were available in 34% hospitals.

Mobile stroke unit was availabe in only 4% hospitals and Tele stroke/STEMI (ST-segment elevation myocardial infarction) was availabe in 19% hospitals.

Figure20: Comparison of Ambulance Services by Category of Hospitals

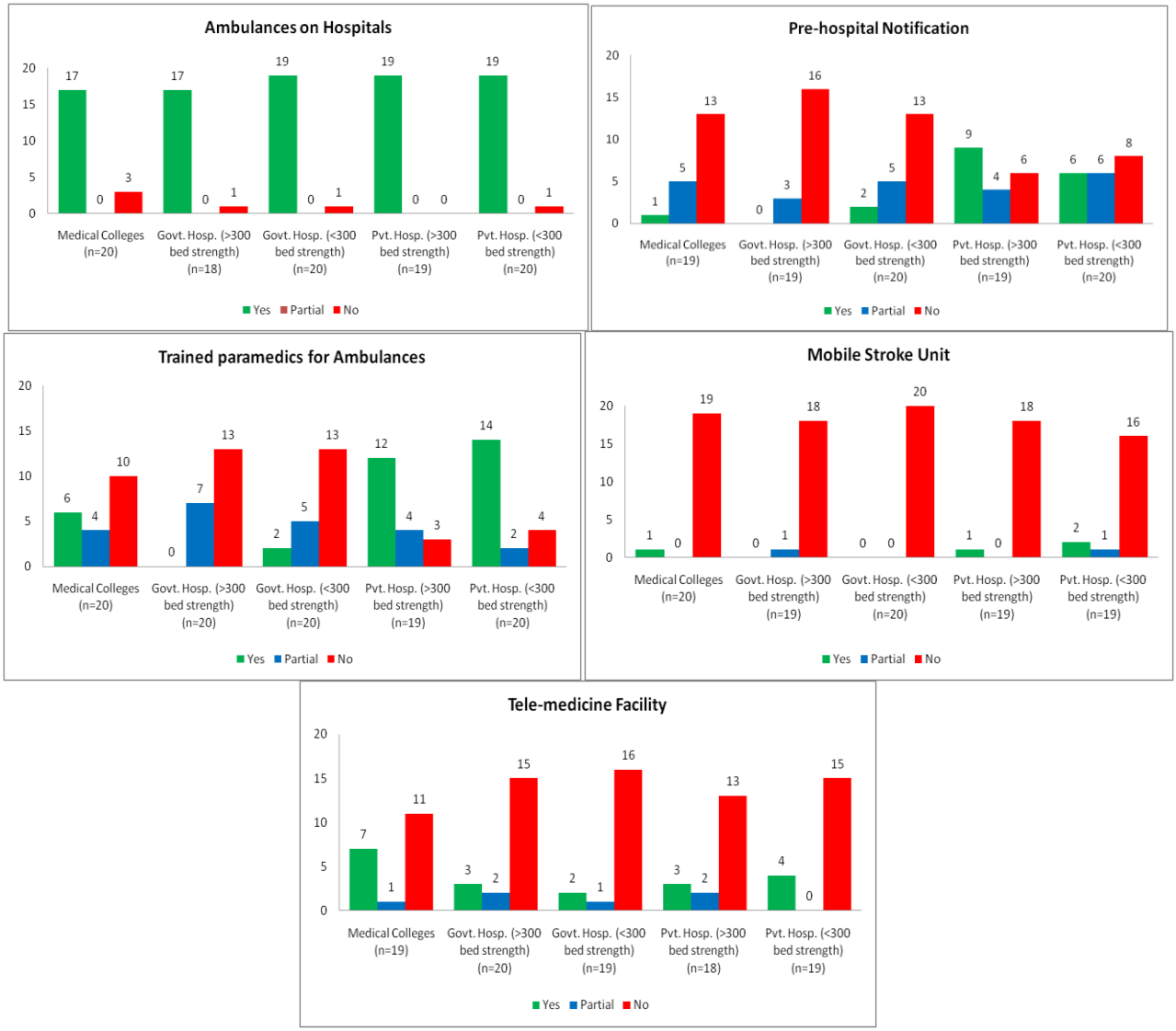


Table 21: Summary of Hospital Ambulance Services by Category of Hospitals

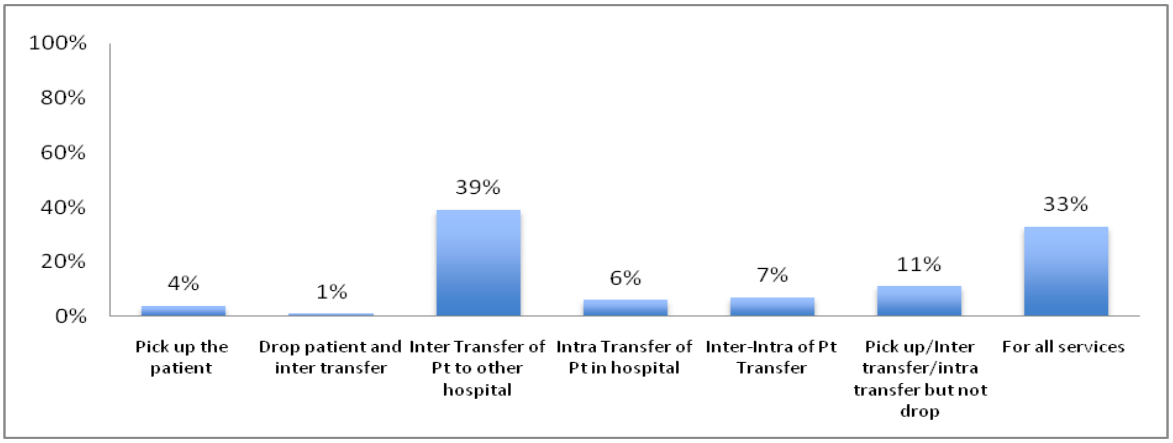
Ambulance Services	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Ambulances in Hospital	17	0	3	17	0	1	19	0	1	19	0	0	19	0	1
Pre Hospital Notification	1	5	13	0	3	16	2	5	13	9	4	6	6	6	8
Trained Paramedics for Ambulances	6	4	10	0	7	13	2	5	13	12	4	3	14	2	4
Mobile Stroke Unit	1	0	19	0	1	18	0	0	20	1	0	18	2	1	16
Tele Medicine Facility	7	1	11	3	2	15	2	1	16	3	2	13	4	0	15

*n=number of 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 21).

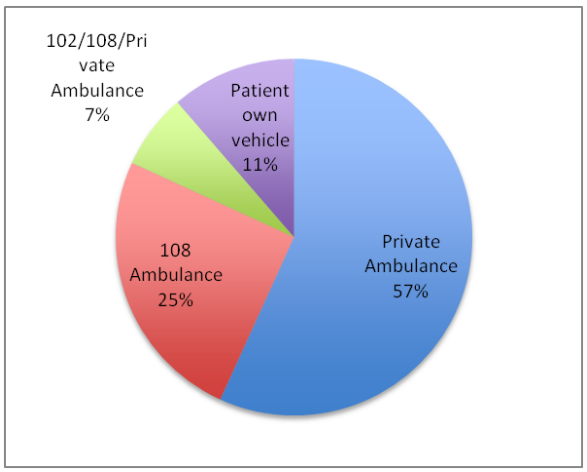
Figure 21: Overall representation of use of Ambulances by Hospitals



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 22).

Figure 22: Overall representation of Patient transfer in case hospital does not have ambulance services



It was observed that 6 hospitals (Christian Institute of Health Sciences & Research, Dimapur; District Hospital, Baramulla, Jammu & Kashmir; Gauhati Medical College & Hospital; Government General Hospital, Guntur; North Goa District Hospitaland IGMC, Shimla) does not have any ambulances while 3 hospitals (Government Multispeciality Hospital, Sector 16, Chandigarh; Apollo Hospitals, Chennaiand Deen Dayal Upadhyay Hospital, Shimla) did not share their ambulance data with our assessor's team.

Best Practices for Hospital Ambulance Services:

- ***Primus Super Speciality Hospital*** is a private 138 bedded hospital and it have best hospital ambulance services out of all 100 hospitals. It has mobile stroke unit as well as tele-medicine facility.
- Hospitals have **GVK centre** which is a Centralized ambulance services in **Goa.**
- **Mobile Stroke Unit** was observed in ***Gauhati Medical College, Medeor Hospital, Sri Ganga Ram Hospital, and Primus Super Speciality Hospital.***

Note: It was found that some government hospitals did not have sufficient staff for ambulances not even drivers. Jallianwala Bagh Matyr Memorial Hospital, Punjab and District Hospital, Peroorkada, Kerala did not have manpower for ambulance.

North Goa District Hospital, Goa is running STEMI Programme by using tele-radiology. 6 hospitals (Christian Institute of Health Sciences & Research, Dimapur; Synod Hospital, Aizawl, Mizoram; Ramakrishna Mission Hospital, Arunachal Pradesh; District Hospital, Pasighat; Shija Hospital & Research Institute, Imphal and Morigaon Civil Hospital, Assam) were found using tele-radiology for various purpose such as for X-ray and CT scan.

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:

A) Hospital-wise comparison:

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.

It was observed that 41% hospitals had documented emergency manual, 30% hospitals had documented policies and procedures for patient transfer in, 30% hospitals had documented policies and procedures for patient transfer out, 57% hospitals gave discharge summary to patients, 58% hospitals had policy on handling cases of death, 44% hospitals had documented disaster management plan, and only 41% hospitals had triage policy in ED.

Table 22: Summary of ED Protocol / SOP / Guidelines by Category of Hospitals

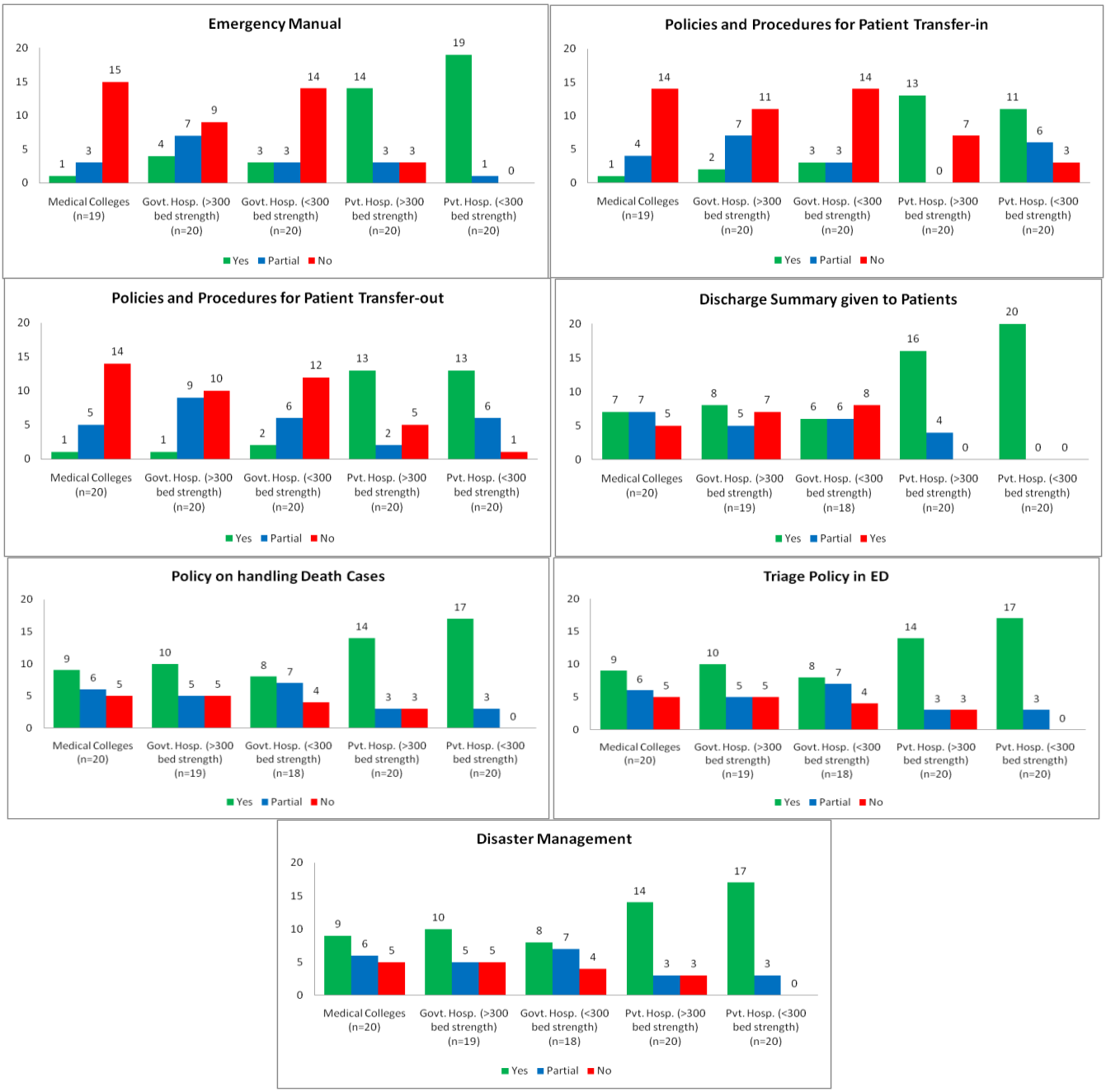
ED Protocol / SOP / Guidelines	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Emergency Manual	1	3	15	4	7	9	3	3	14	14	3	3	19	1	0
Policies and procedures for patient transfer in	1	4	15	2	7	11	3	3	14	13	0	7	11	6	3
Policies and procedures for patient transfer out	1	5	14	1	9	10	2	6	12	13	2	5	13	6	1
Discharge Summary to patients	7	7	5	8	5	7	6	6	8	16	4	0	20	0	0
Policy on handling death cases	9	6	5	10	5	5	8	7	4	14	3	3	17	3	0
Disaster Management Plan	6	2	12	5	5	10	5	3	10	14	1	5	14	2	3
Triage Policy in ED	5	0	14	3	2	15	5	0	15	12	0	8	16	0	3

FIn medical college, only one hospital (IPGMER & SSKM Hospital) had emergency manual, 1 hospital (IPGMER & SSKM Hospital) had documented policies and procedures for patient transfer in, 1 hospital (IPGMER & SSKM Hospital) had documented policies and procedures for patient transfer out, 7 hospitals (Civil Hospital, Ahemdabad; Agartala Government Medical College & G B Pant Hospital; Sher - I - Kashmir Institute of Medical Sciences, Srinagar, Government General Hospital, Guntur; SMS Medical College & Hospital; AIIMS, Bhopal and IPGMER & SSKM Hospital) gave discharge summary to patients, 9 hospitals had policy on handling cases of death, 6 hospitals had documented disaster management plan, and only 5 hospitals (AIIMS, Bhopal; Rajiv Gandhi Government General Hospital, Madras Medical College; JIPMER, Pondicherry; Government

Medical College, Thiruvananthapuram and IPGMER & SSKM Hospital) had triage policy in ED (table 22 and figure 23).

It was observed that 7 district hospitals had documented emergency manual, 3 district hospitals had documented policies and procedures for patient transfer in, 2 district hospitals had documented policies and procedures for patient transfer out, 11 district hospitals gave discharge summary to patients, 15 district hospitals had policy on handling cases of death, 9 district hospitals had documented disaster management plan, and only 6 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.

Figure 23: Comparison of ED Protocol / SOP / Guidelines by Hospital Categories



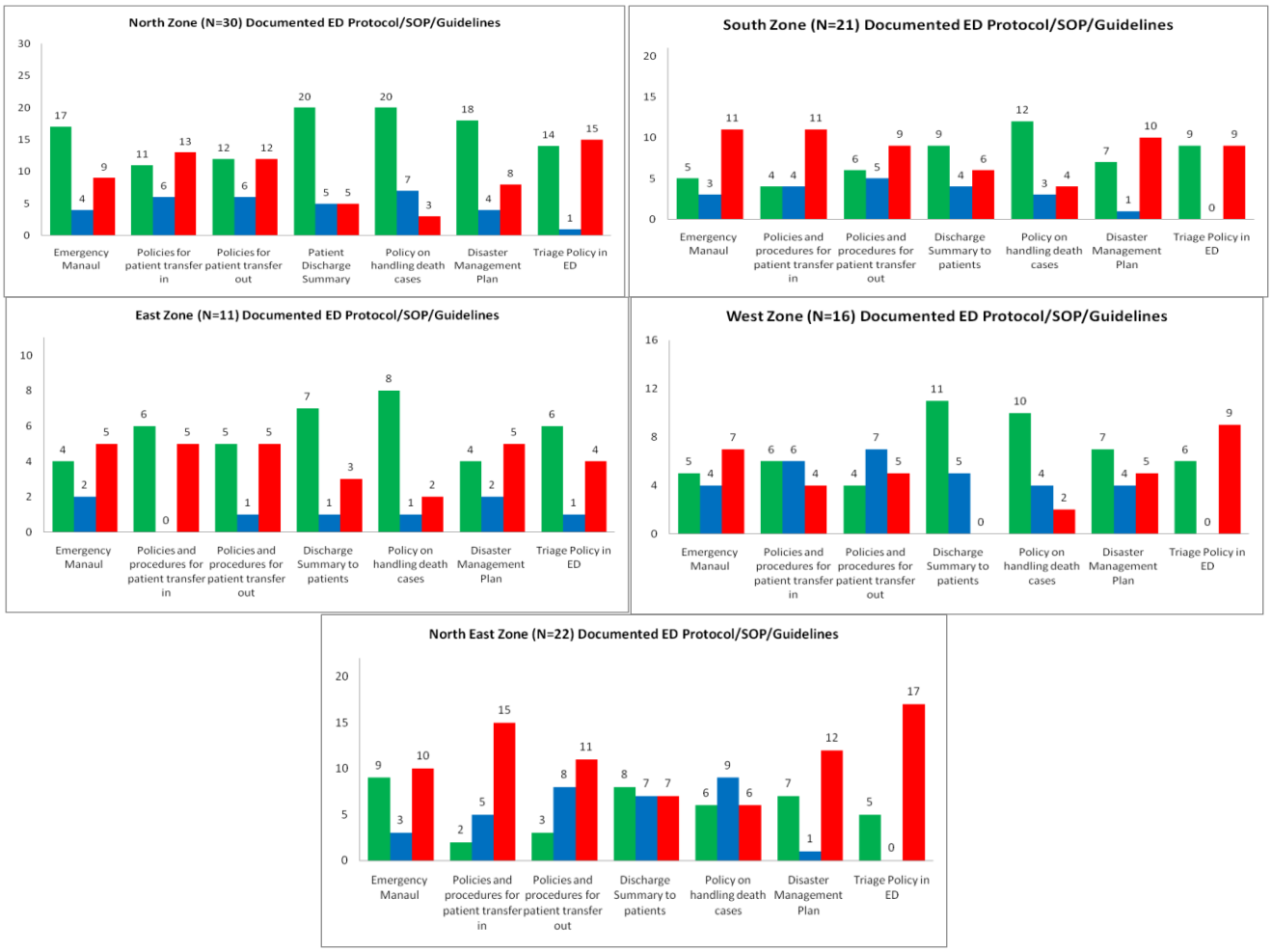
B) Zone-wise comparison:

Table 23: Zone-wise Summary of ED Protocol / SOP / Guidelines in Hospitals

ED Protocol / SOP / Guidelines	North (n=30)			South (n=21)			East (n=11)			West (n= 16)			North East (n=22)		
	No	Partial	Yes	No	Partial	Yes	No	Partial	Yes	No	Partial	Yes	No	Partial	Yes
Emergency Manual	9	4	17	11	3	5	5	2	4	7	4	5	10	3	9
Policies and procedures for patient transfer in	13	6	11	11	4	4	5	0	6	4	6	6	15	5	2
Policies and procedures for patient transfer out	12	6	12	9	5	6	5	1	5	5	7	4	11	8	3
Discharge Summary to patients	5	5	20	6	4	9	3	1	7	0	5	11	7	7	8
Policy on handling death cases	3	7	20	4	3	12	2	1	8	2	4	10	6	9	6
Disaster Management Plan	8	4	18	10	1	7	5	2	4	5	4	7	12	1	7
Triage Policy in ED	15	1	14	9	0	9	4	1	6	9	0	6	17	0	5

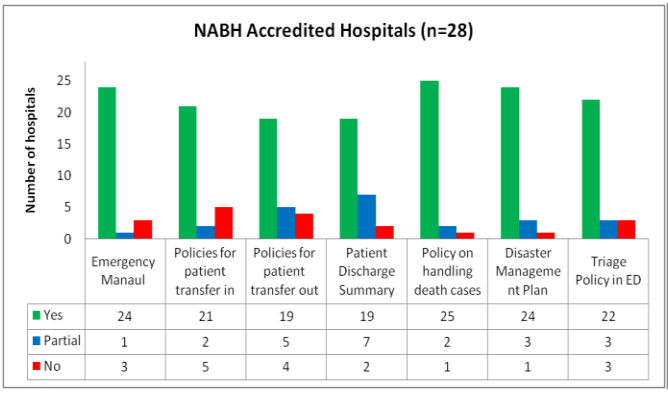
*n=number of hospitals

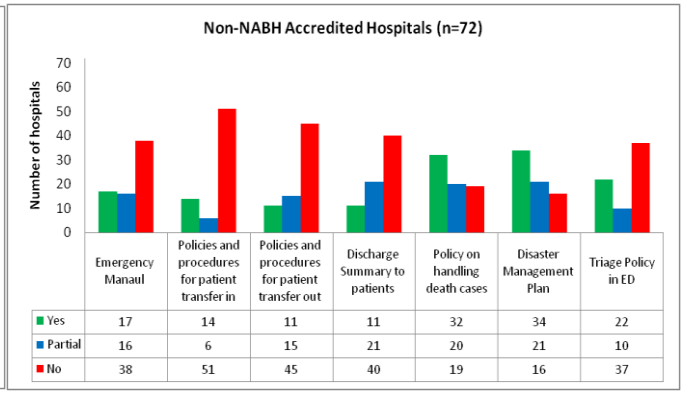
Figure 24: Zone-wise Comparison of ED Protocol / SOP / Guidelines in hospitals



C) NABH Acrcreditation-wise comparison:

Figure 25: Overall Comparison of ED Protocol / SOP / Guidelines in NABH accredited and non-NABH Accredited Hospitals



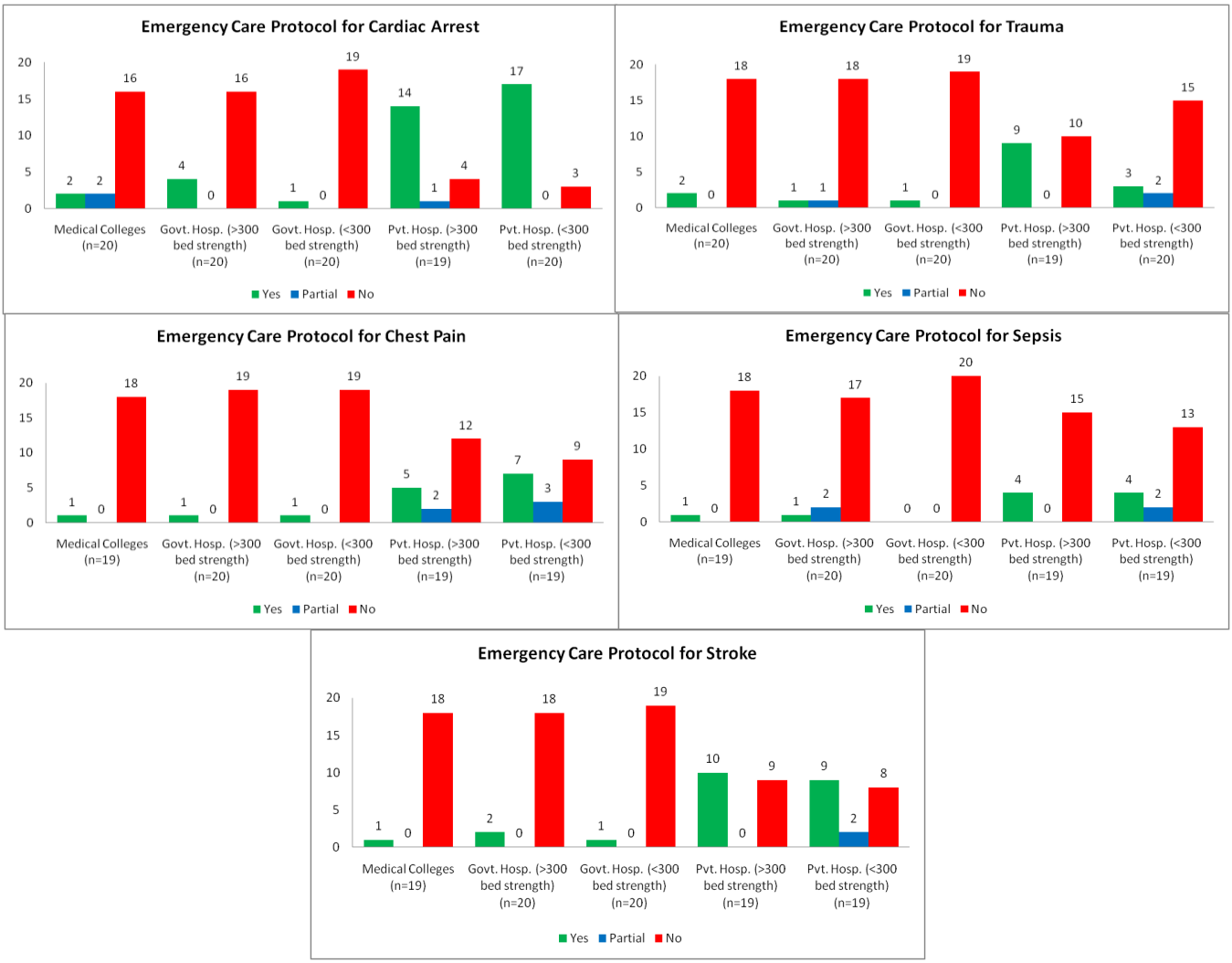


14. Emergency care protocols:

A) Hospital-wise comparison:

In Emergency Department, some emergency care protocols are present which have emergency care protocol for different diseases. 38% hospitals had alert system for cardiac arrest, 16% had alert system for trauma, 15% had alert system for chest pain, only 10% had for sepsis and 23% had alert system for stroke (table 24 and figure 26).

Figure26: Comparison of Emergency Care Protocols by Hospital Categories



In medical college, 2 hospitals (Rajiv Gandhi Government General Hospital, Madras Medical College and IPGMER & SSKM Hospital) have alert system for cardiac arrest and for trauma, only 1 hospital (IPGMER & SSKM Hospital) have alert system for chest pain, for sepsis and for stroke.

In government hospitals >300 beds, 4 hospitals (District Hospital, Baramulla, J&K; Government District Hospital, Tenali; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow and Government Multispeciality Hospital, Sector 16, Chandigarh) have alert system for cardiac arrest, 1 hospital (District Hospital, Baramulla, J&K) have alert system for trauma, 1 hospital (District Hospital, Baramulla, J&K) have alert system for chest pain, only 1 hospital (District Hospital, Karim Nagar)

have alert system for sepsis and 2 hospitals (District Hospital, Baramulla, J&K and Government District Hospital, Tenali) have alert system for stroke.

In government hospitals <300 beds, only 1 hospital (Dr Jogalekar Hospital, Pune) have alert system for cardiac arrest, for trauma, for chest pain for stroke.

Table 24: Overall Summary of Emergency Care protocols by Category of Hospitals

Emergency Care Protocols	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Blue: Cardiac Arrest	2	2	16	4	0	16	1	0	19	14	1	4	17	0	3
Trauma	2	0	18	1	1	18	1	0	19	9	0	10	3	2	15
Chest Pain	1	0	18	1	0	19	1	0	19	5	2	12	7	3	9
Sepsis	1	0	18	1	2	17	0	0	20	4	0	15	4	2	13
Stroke	1	0	18	2	0	18	1	0	19	10	0	9	9	2	8

*n: number of hospitals

B) Zone-wise comparison:

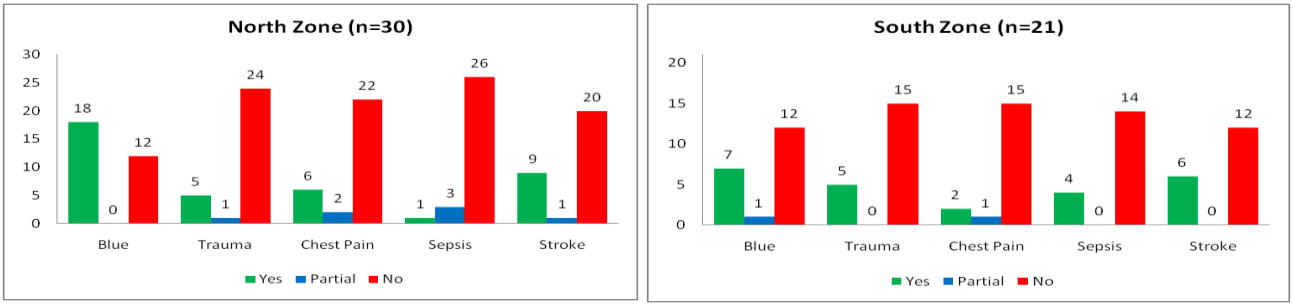
Table 25 depicts the comparison of emergency care protocols at the assessed healthcare facilities.

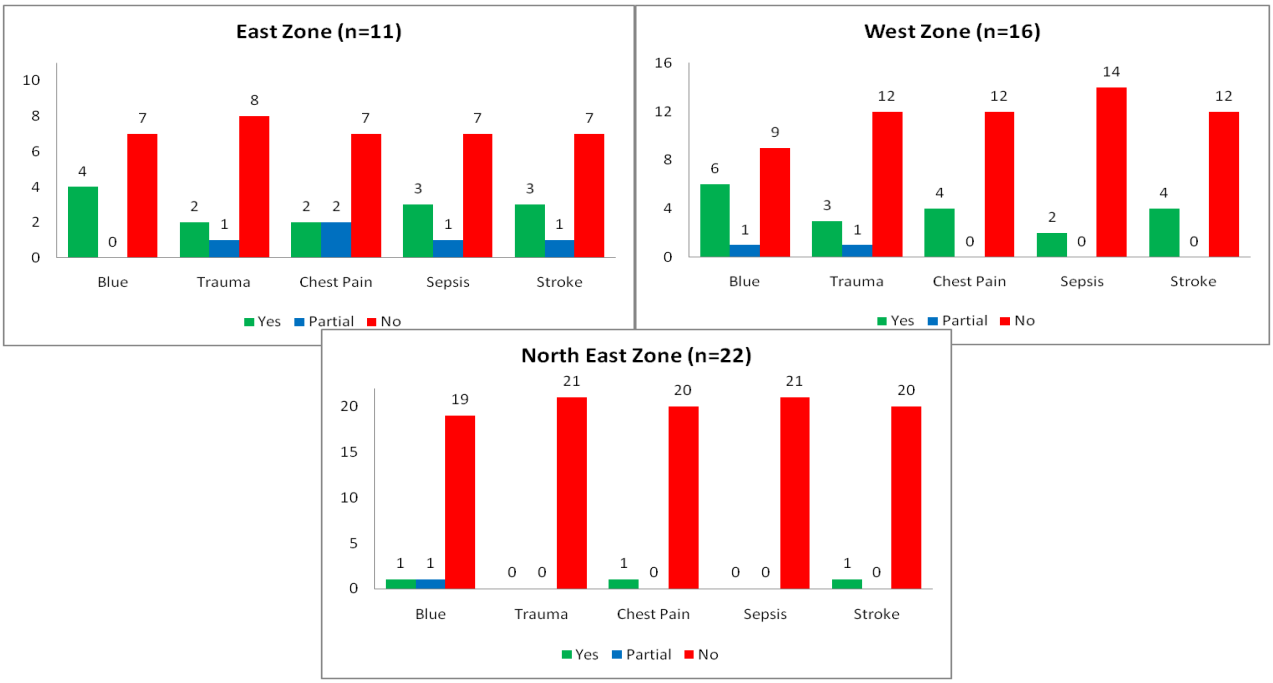
Table 25: Zone-wise Summary of Emergency Care protocols in Hospitals

Emergency Care Protocols	North (n=30)			South (n=21)			East (n=11)			West (n= 16)			North East (n=22)		
	No	Partial	Yes	No	Partial	Yes	No	Partial	Yes	No	Partial	Yes	No	Partial	Yes
Cardiac Arrest	12	0	18	12	1	7	7	0	4	9	1	6	19	1	1
Trauma	24	1	5	15	0	5	8	1	2	12	1	3	21	0	0
Chest Pain	22	2	6	15	1	2	7	2	2	12	0	4	20	0	1
Sepsis	26	3	1	14	0	4	7	1	3	14	0	2	21	0	0
Stroke	20	1	9	12	0	6	7	1	3	12	0	4	20	0	1

*n=number of hospitals

Figure 27: Zone-wise Comparison of Emergency Care Protocols in Hospitals

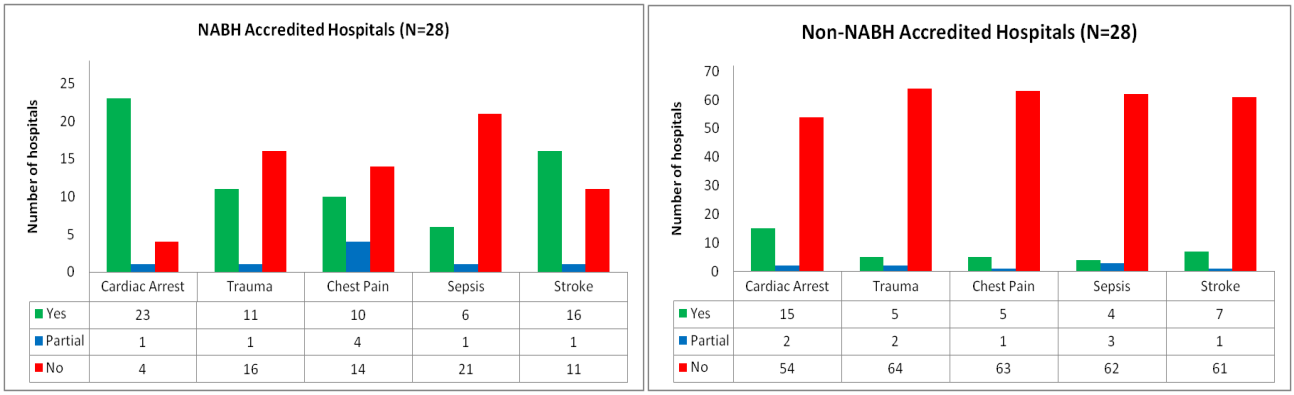




C) NABH and non-NABH Accredited Hospitals comparison:

Figure 28 depicts the comparison of NABH and non-NABH accredited hospitals for the emergency care protocols.

Figure 28: Overall Comparison of Emergency Care protocols in NABH accredited and non-NABH Accredited Hospitals



NABH Accredited Hospitals (N=28)	Cardiac Arrest	Trauma	Chest Pain	Sepsis	Stroke
Yes	23	11	10	6	16
Partial	1	1	4	1	1
No	4	16	14	21	11

Non-NABH Accredited Hospitals (N=28)	Cardiac Arrest	Trauma	Chest Pain	Sepsis	Stroke
Yes	15	5	5	4	7
Partial	2	2	1	3	1
No	54	64	63	62	61

Suggestions:

1. Develop standardized evidence based emergency care protocols (administrative and clinical).
2. Development of academic residency programme.
3. Implementation of triage policy in each hospital.
4. NABH Accreditation.
5. Increase the scope of **Good Samaritan Law** from road traffic injuries to other time sensitive conditions.

15. Measures ensuring Safety & Security in Hospitals:

Several safety aspects were assessed for Emergency Department which is mentioned in the below tables 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.

Nearly all private hospitals had periodic training programmes in their hospitals while most of the government hospitals including medical colleges did not have regular periodic training of staff. Similarly, mock drill conducted in most of the private hospitals while mostly government hospitals did not conduct mock drill.

These aspects also assessed according to hospital bed strength

A. Category wise (table 26and figure 29)
B. 5 Zones of our country (zone wise) (table 27 and figure 30)
C. NABH accredited and non-NABH accredited hospitals (figure 31).

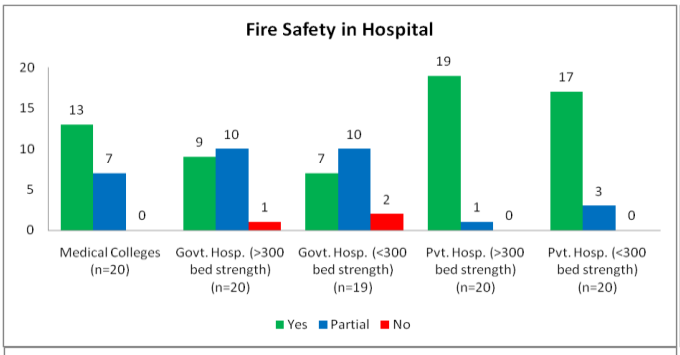
A) Hospital-wise comparison:

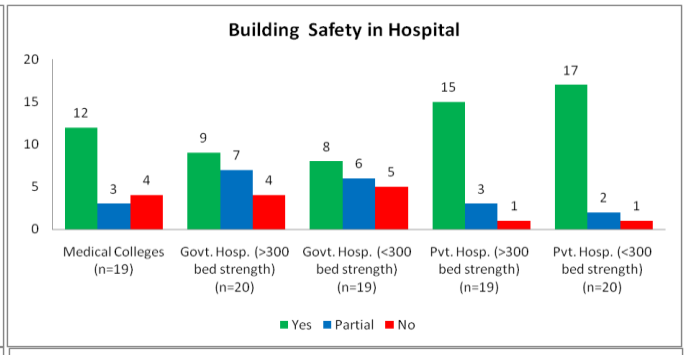
Table 26: Overall Summary of measures ensuring Safety & Security by Category of Hospitals

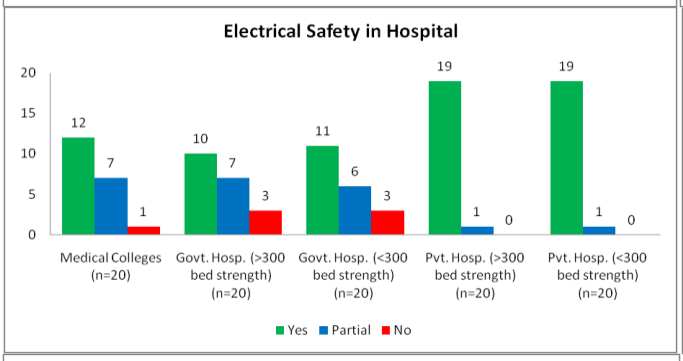
Safety & Security measures	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Fire Safety	13	7	0	9	10	1	7	10	2	19	1	0	17	3	0
Building Safety	12	3	4	9	7	4	8	6	5	15	3	1	17	2	1
Electrical Safety	12	7	1	10	7	3	11	6	3	19	1	0	19	1	0
Patient and Provider Safety	12	7	0	8	9	3	8	6	5	17	3	0	20	0	0
Chemical Safety	9	10	1	7	7	5	8	8	3	20	0	0	18	1	0
Periodic Training of Staff	7	5	8	4	9	7	3	13	4	16	3	1	18	2	0
Periodic Mock Drill	6	5	9	4	7	9	3	11	6	16	3	1	17	3	0
Police Post Available in Premises	15	2	3	15	0	5	5	4	11	4	3	13	2	2	16
Alarm Bell/Code Announcement in ED	3	7	9	4	2	13	2	2	16	14	1	5	16	2	1

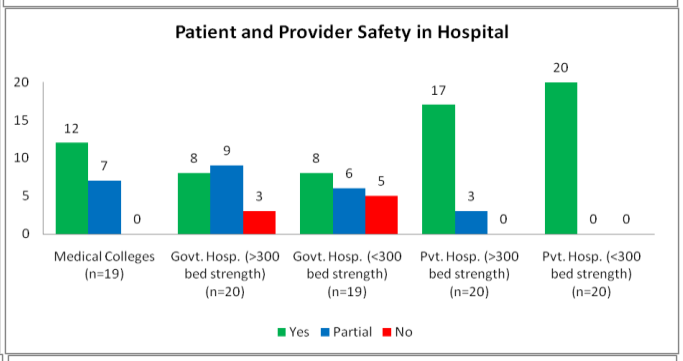
*n: number of hospitals, ED: Emergency Department

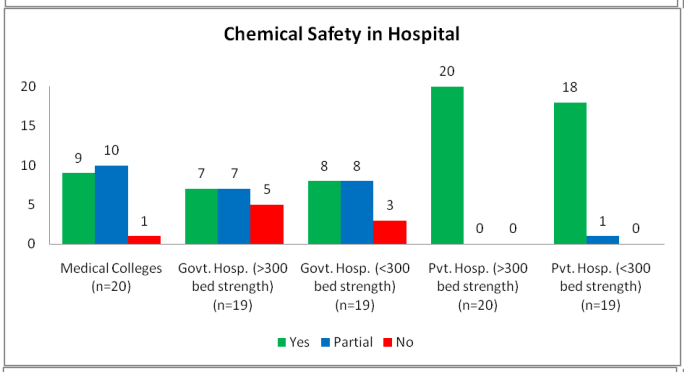
Figure 29: Comparison of measures ensuring Safety & Security by Hospital Categories

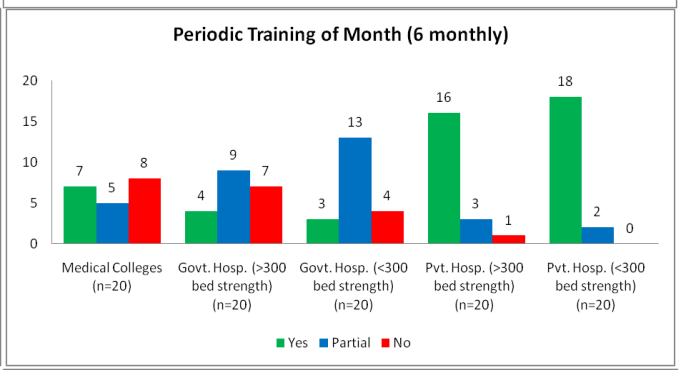


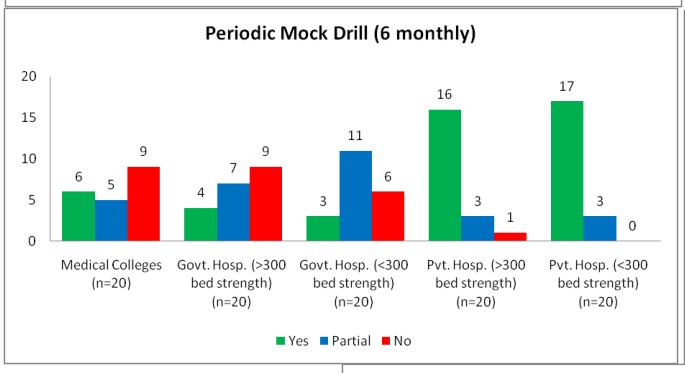


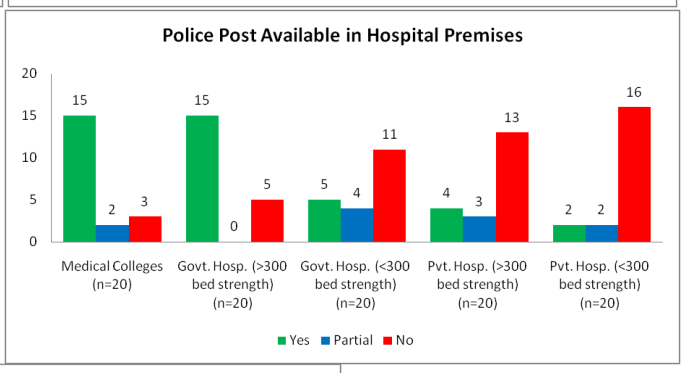


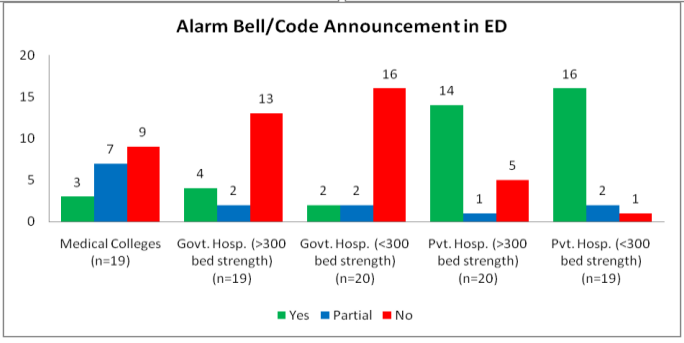






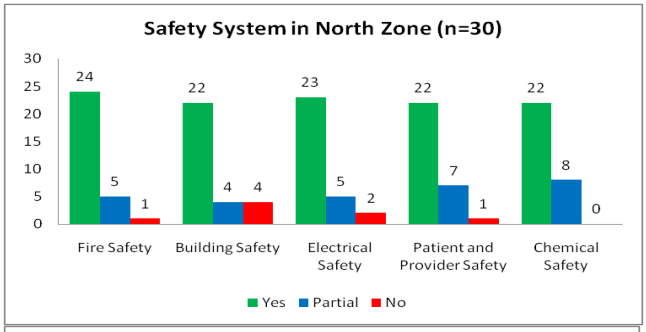


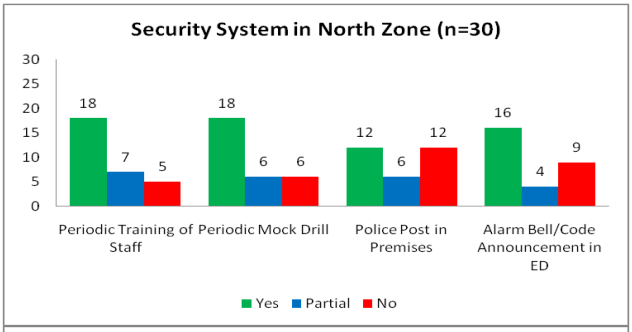


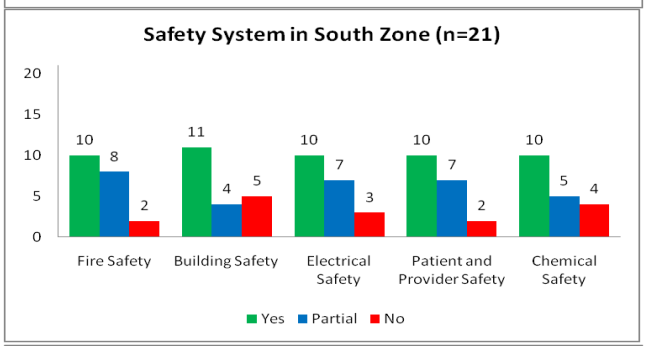


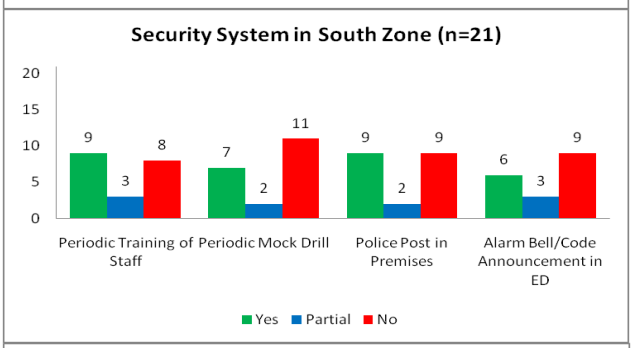
B) Zone-wise comparison:

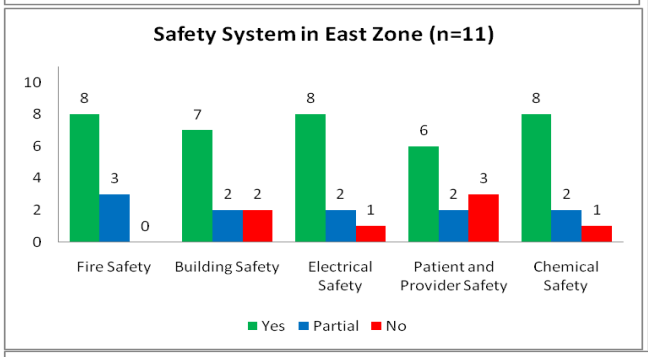
Figure 30: Zone-wise Comparison of measures ensuring Safety & Security in Hospitals

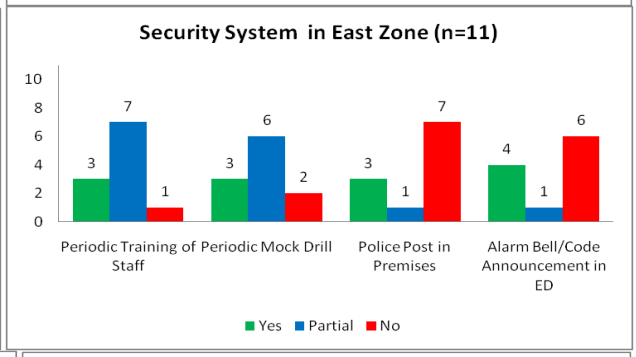


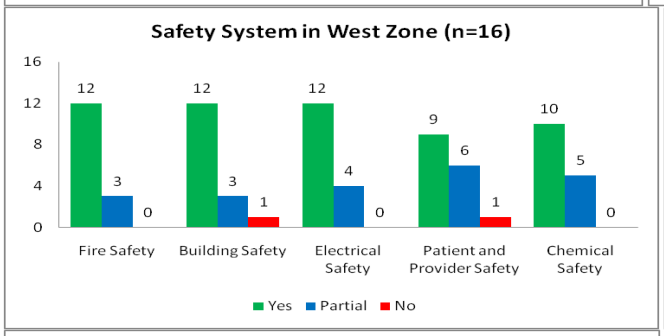


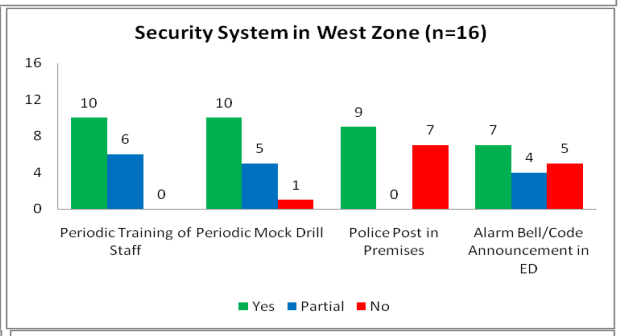


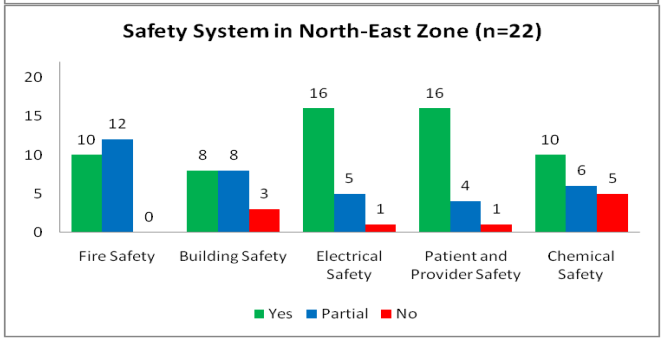












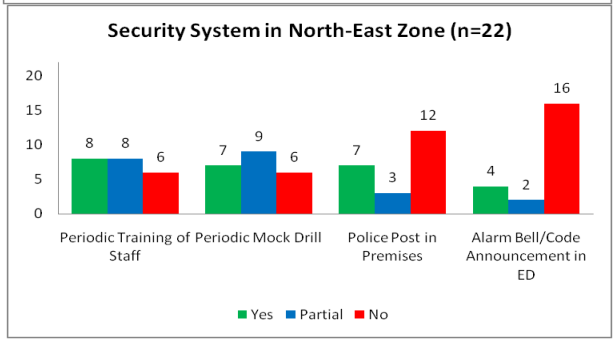


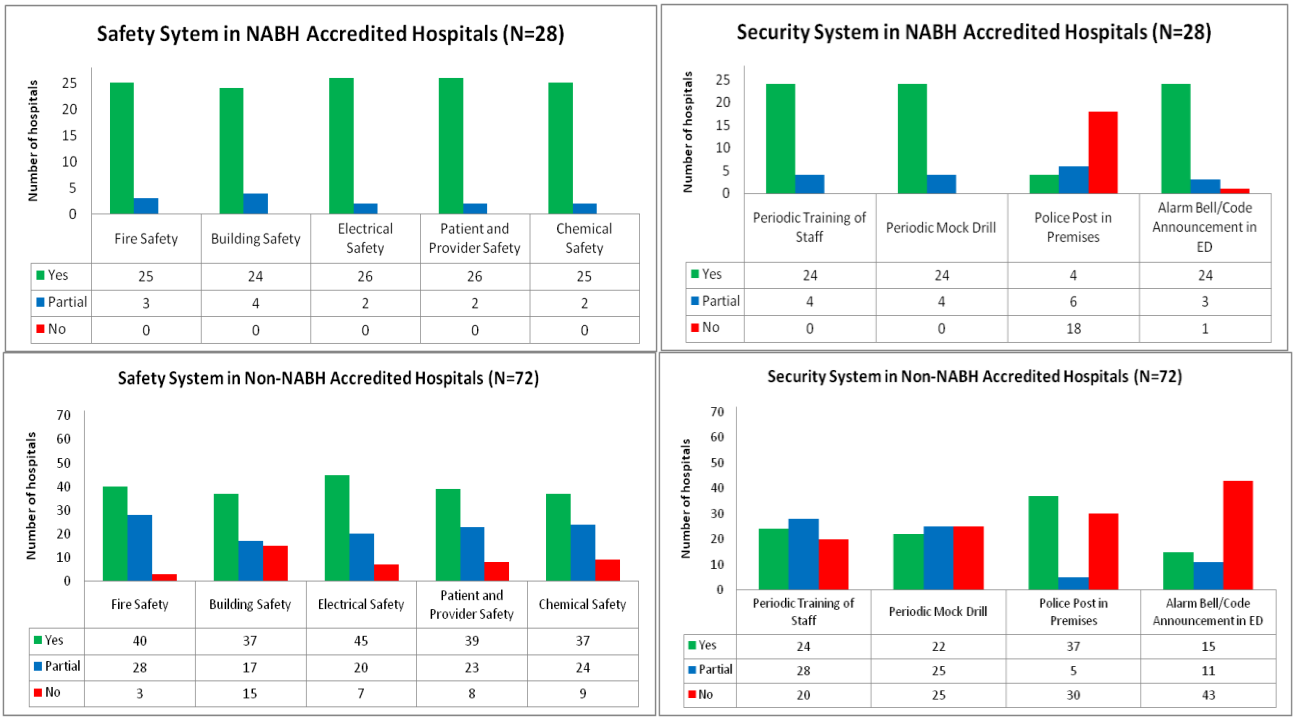
Table 27: Zone-wise measures ensuring Summary of Safety & Security in Hospitals

Safety & Security	North (n=30)			South (n=21)			East (n=11)			West (n= 16)			North East (n=22)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Fire Safety	24	5	1	10	8	2	8	3	0	12	3	0	10	12	0
Building Safety	22	4	4	11	4	5	7	2	2	12	3	1	8	8	3
Electrical Safety	23	5	2	10	7	3	8	2	1	12	4	0	16	5	1
Patient and Provider Safety	22	7	1	10	7	2	6	2	3	9	6	1	16	4	1
Chemical Safety	22	8	0	10	5	4	8	2	1	10	5	0	10	6	5
Periodic Training of Staff	18	7	5	9	3	8	3	7	1	10	6	0	8	8	6
Periodic Mock Drill	18	6	6	7	2	11	3	6	2	10	5	1	7	9	6
Police Post Available in Premises	12	6	12	9	2	9	3	1	7	9	0	7	7	3	12
Alarm Bell/Code Announcement in ED	16	4	9	6	3	9	4	1	6	7	4	5	4	2	16

*n=number of hospitals, ED=Emergency Department

C) NABH Accreditation comparison:

Figure 31: Comparison of Safety & Security in NABH and Non-NABH Accredited Hospitals



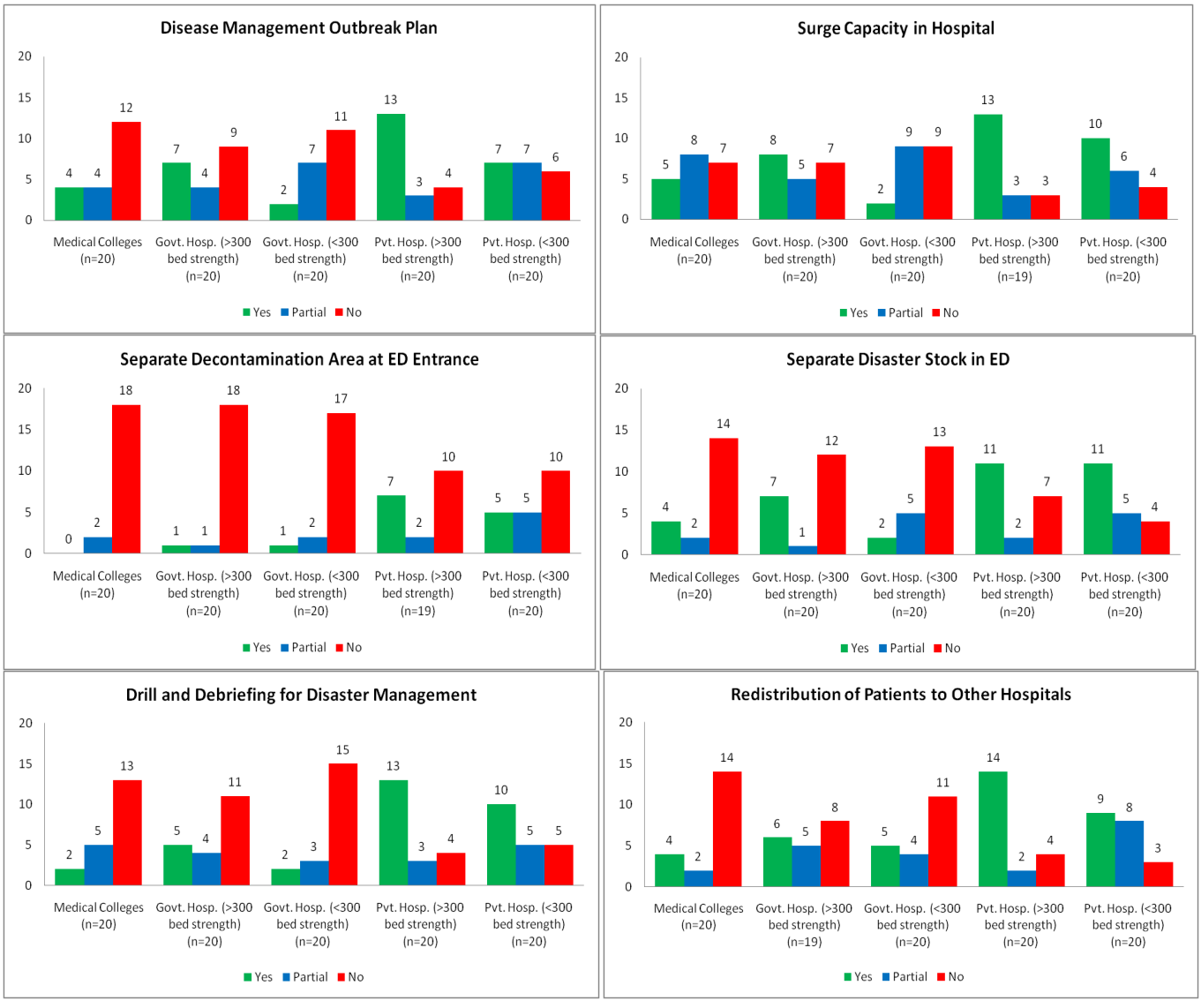
16. Disaster Management:

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

A) Hospital-wise comparison:

The preparedness/readyness of hospitals for disaster management were analysed according to the categories of hospitals as depicted in the below table and graph.

Figure 32: Comparison of preparedness/readyness for Disaster Management by Hospital Categories



It was observed that only 33 hospitals have documented disease outbreak management plan, 38 hospitals have surge capacity, only 14 hospitals *(2 government hospitals: Government Multispeciality hospital, Sector-16 and Dr Jogalekar Hospital)* have separate decontamination area for ED entrance, 35 hospitals have separate disease stock in ED, 32 hospitals conducted

drill and debriefing for disaster management, and 38 hospitals have system to redistribution of patients to other hospitals during disaster.

Table 28: Summary of preparedness/readyness for Disaster Management by Category of Hospitals

Disaster Management	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Disease Management Outbreak Plan	4	4	12	7	4	9	2	7	11	13	3	4	7	7	6
Surge Capacity	5	8	7	8	5	7	2	9	9	13	3	3	10	6	4
Separate Decontamination Area at ED entrance	0	2	18	1	1	18	1	2	17	7	2	10	5	5	10
Separate Disaster Stock in ED	4	2	14	7	1	12	2	5	13	11	2	7	11	5	4
Drill and Debriefing for Disaster Management	2	5	13	5	4	11	2	3	15	13	3	4	10	5	5
Redistribution of pts to other hospitals	4	2	14	6	5	8	5	4	11	14	2	4	9	8	3

*n: number of hospitals, ED: Emergency Department

B) Zone-wise comparison:

Mostly healthcare facilities did not have separate decontamination area at ED entrance. Government hospitals and medical colleges did not conducted drill and debriefing for disaster management.

The government healthcare facilities also lack the system for redistribution of patients to other network hospitals during disaster (Zone wise-table 29 and figure 33).

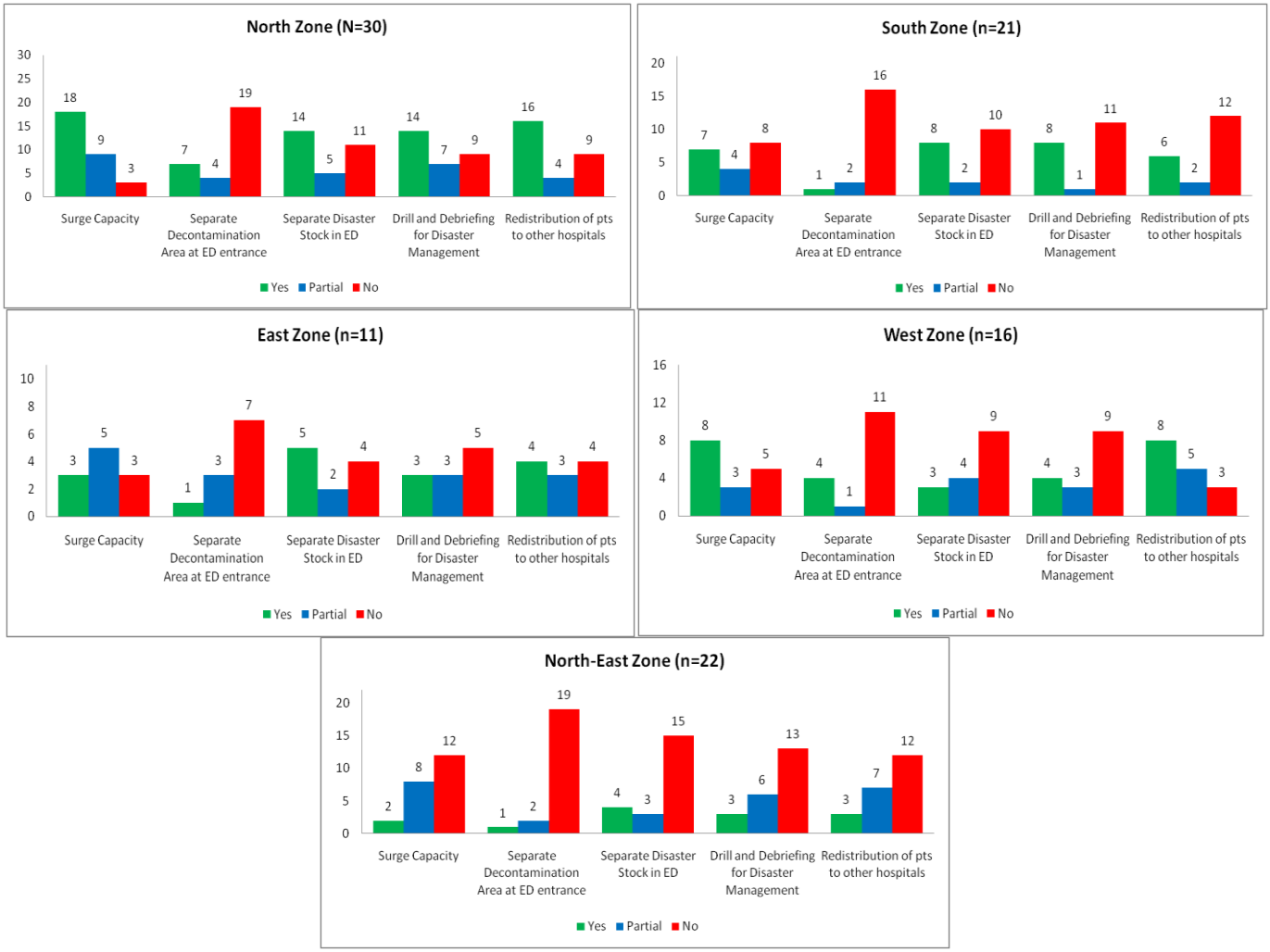
Table 29: Zone-wise Summary of preparedness/readyness for Disaster Management in Hospitals

Disaster Management	North (n=30)			South (n=21)			East (n=11)			West (n= 16)			North East (n=22)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Surge Capacity	18	9	3	7	4	8	3	5	3	8	3	5	2	8	12
Separate Decontamination Area at ED entrance	7	4	19	1	2	16	1	3	7	4	1	11	1	2	19
Separate Disaster Stock in ED	14	5	11	8	2	10	5	2	4	3	4	9	4	3	15
Drill and Debriefing for Disaster Management	14	7	9	8	1	11	3	3	5	4	3	9	3	6	13
Redistribution of pts to other hospitals	16	4	9	6	2	12	4	3	4	8	5	3	3	7	12

*n: number of hospitals, ED: Emergency Department

It was observed during analysis that north-east was the weakest zone in disaster management in all the required aspects as mentioned in table 29 and figure 33.

Figure 33: Zone-wise Comparison of preparedness/readyness for Disaster Management in Hospitals



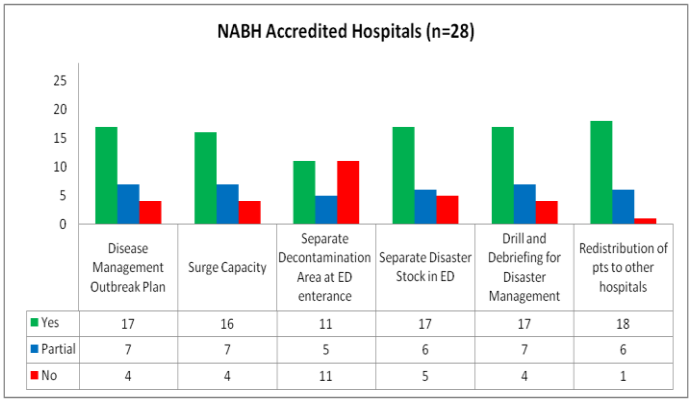
C) NABH Accreditation comparison:

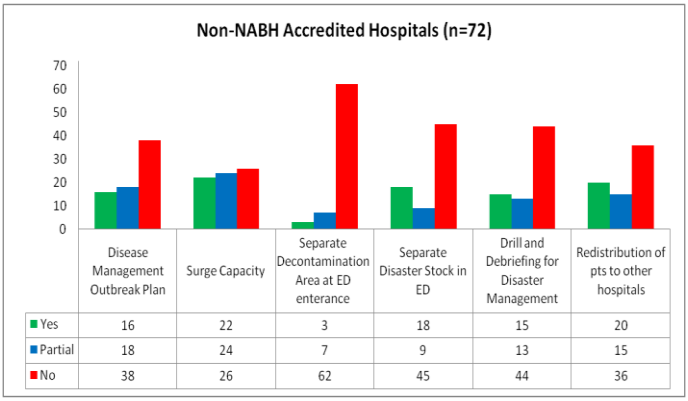
In addition, it was also observed that the hospitals which were NABH accredited had good disaster management system when compared with non-NABH accredited hospitals (figure 34).

Best Practices for preparedness/readiness for Disaster Management:

Fortis Hospital, Punjab, Government Multispecialty Hospital, Sector 16, Apollo Hospital, Paras HMRI Hospital, Ramakrishna Care Hospital, Medeor Hospital, and ***Sri Ganga Ram Hospital*** had all the required stocks and requirements needed for disaster management.

Figure 34: Overall Comparison of preparedness/readyness for Disaster Management in NABH and Non-NABH Accredited Hospitals





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.

A) Hospital-wise comparison:

It was observed that 40% hospitals had dedicated staff for identification and loop closure, 52% hospitals undergo regular audits, 42% hospitals had continuous education and training programs, 42% hospitals had key indicators for quality monitored, only 22% hospitals had quality indicators for urgent and interventional procedures monitored, 50% hospitals had death review committee, and 42% hospitals had central empowered hospital committee for continuous quality improvement for emergency services.

Most of the government hospitals and medical colleges do not run continuous quality improvement programmes and training while on the other hand; private hospitals showed good performance in continuous quality improvement (table 30 and figure 35).

Table 30: Summary of Continuous Quality Improvement by Category of Hospitals

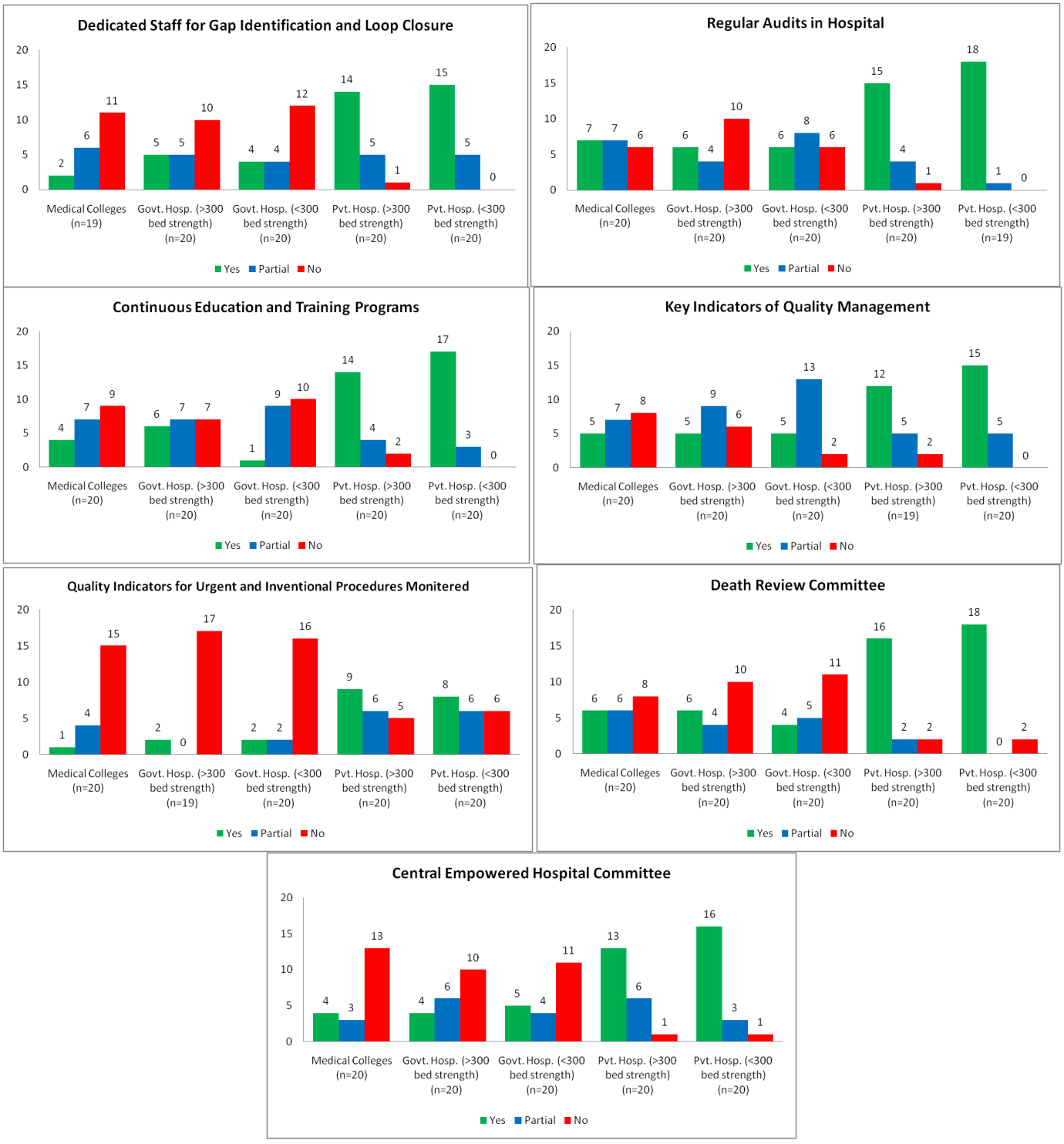
Continuous Quality Improvement	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Dedicated Staff for gap identification & loop closure	2	6	11	5	5	10	4	4	12	14	5	1	15	5	0
Regular audits in hospital	7	7	6	6	4	10	6	8	6	15	4	1	18	1	0
Continuous Education and Training programs	4	7	9	6	7	7	1	9	10	14	4	2	17	3	0
Key Indicators of Quality Monitored	5	7	8	5	9	6	5	13	2	12	5	2	15	5	0
Quality Indicators for urgent and interventional procedures monitored	1	4	15	2	0	17	2	2	16	9	6	5	8	6	6
Death Review Committee	6	6	8	6	4	10	4	5	11	16	2	2	18	0	2
Central Empowered Hospital Committee	4	3	13	4	6	10	5	4	11	13	6	1	16	3	1

*n: number of hospitals

Out of 20 medical colleges, 2 hospitals (Civil Hospital, Ahmedabad and JIPMER Pondicherry) had dedicated staff for identification and loop closure, 7 hospitals undergo regular audits, 4 hospitals (Regional Institute of Medical Sciences, Imphal; Rajiv Gandhi Government General Hospital, Madras Medical College; JIPMER, Pondicherry and IPGMER & SSKM Hospital) had continuous education and training programs, 5 hospitals had key indicators for quality monitored, only 1 hospital (Gauhati Medical College & Hospital) had quality indicators for urgent and interventional procedures monitored, 6 hospitals had death review committee, and 4 hospitals (Civil Hospital, Ahemdabad; Rajiv Gandhi Government General Hospital, Madras Medical College; JIPMER, Pondicherry and

IPGMER & SSKM Hospital) had central empowered hospital committee for continuous quality improvement for emergency services.

Figure 35: Comparison of Continuous Quality Improvement by Hospital Categories



Out of 20 government 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. *6 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, AIIMS, Patna 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. *6 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; AIIMS, Patna and Deen Dayal Upadhyay Hospital, H.P.)*
7. *4 hospitals had central empowered hospital committee for continuous quality improvement for emergency services (Jallianwala Bagh Matyr Memorial Hospital, Amritsar; District Hospital, Baramulla, J&K; AIIMS, Bhubneshwar and Government Multispeciality Hospital, Sector 16)*

Out of 20 government hospitals <300 beds, following were observed:

1. *4 hospitals had dedicated staff for identification and loop closure (Civil Hospital, Aizawl, Mizoram; District Hospital, Ganderbal; Dr Jogalekar Hospital, Pune and District Hospital, Singtam)*
2. *6 hospitals undergo regular audits (Civil Hospital, Aizawl, Mizoram; District Hospital, Pasighat; District Hospital, Singtam; District Hospital, King Koti; Dr Jogalekar Hospital, Pune and North Goa District Hospital)*
3. *Only 1 hospital had continuous education and training programs (Dr Jogalekar Hospital, Pune)*
4. *5 hospitals had key indicators for quality monitored (Civil Hospital, Aizawl, Mizoram; District Hospital, Singtam; District Hospital, King Koti; Dr Jogalekar Hospital, Pune and North Goa District Hospital)*
5. *2 hospitals had quality indicators for urgent and interventional procedures monitored (North Goa District Hospital and Dr Jogalekar Hospital, Pune)*
6. *4 hospitals had death review committee (Civil Hospital, Aizawl, Mizoram; District Hospital, Pasighat; District Hospital, Singtam and North Goa District Hospital)*
7. *5 hospitals had central empowered hospital committee for continuous quality improvement for emergency services (Civil Hospital, Aizawl, Mizoram; District Hospital, Singtam; District Hospital, King Koti; Dr Jogalekar Hospital, Pune and North Goa District Hospital)*

B) Zone-wise comparison:

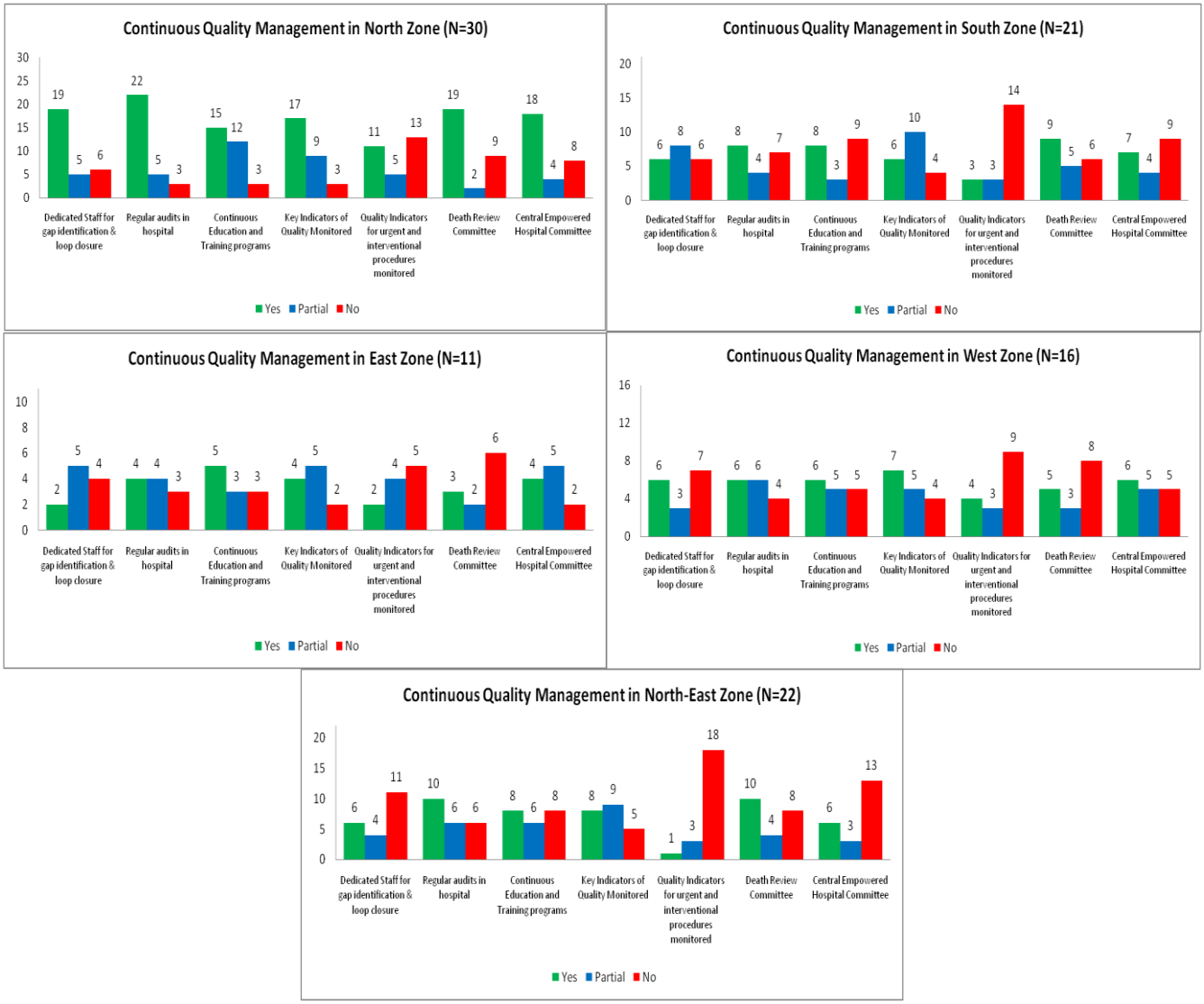
It was observed that North zone performed best out of all 5 zones in continuous quality improvement while the rest of the zones performed below average (table 31 and figure 36).

Table 31: Zone-wise Summary of Continuous Quality Improvement in Hospitals

Continuous Quality Improvement	North (n=30)			South (n=21)			East (n=11)			West (n=16)			North East (n=22)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Dedicated Staff for gap identification & loop closure	19	5	6	6	8	6	2	5	4	6	3	7	6	4	11
Regular audits in hospital	22	5	3	8	4	7	4	4	3	6	6	4	10	6	6
Continuous Education and Training programs	15	12	3	8	3	9	5	3	3	6	5	5	8	6	8
Key Indicators of Quality Monitored	17	9	3	6	10	4	4	5	2	7	5	4	8	9	5
Quality Indicators for urgent and interventional procedures monitored	11	5	13	3	3	14	2	4	5	4	3	9	1	3	18
Death Review Committee	19	2	9	9	5	6	3	2	6	5	3	8	10	4	8
Central Empowered Hospital Committee	18	4	8	7	4	9	4	5	2	6	5	5	6	3	13

*n: number of hospitals

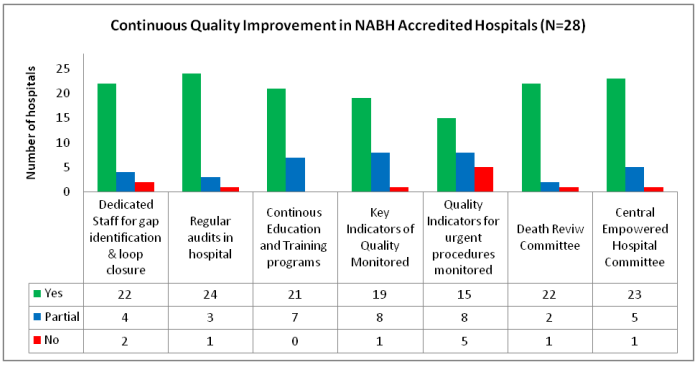
Figure 36: Zone-wise Comparison of Continuous Quality Improvement in Hospitals

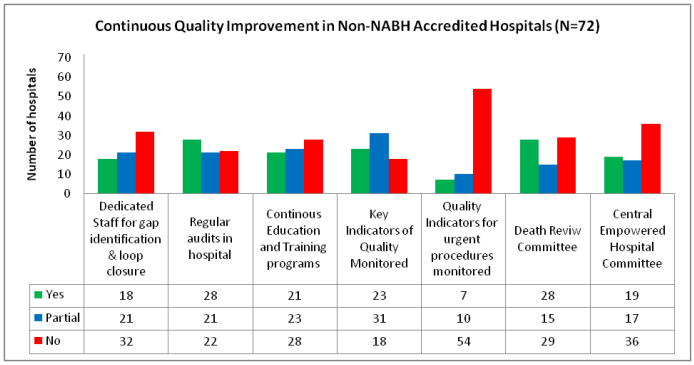


C) NABH and non-NABH Accredited Hospitals comparison:

In addition, it was observed that NABH accredited hospitals had good performance in continuous quality improvement when compared to non-NABH accredited (figure 37).

Figure 37: Overall Comparison of Continuous Quality Improvement in NABH and Non-NABH Accredited Hospitals





NABH accredited healthcare facilities had regular audits in their facility, dedicated staff for loop closure, runs training program cycles for skill development, had key indicators and quality indicators for urgent and interventional procedures monitored. They had death review committee to review the cause of patient's death. Most of the NABH accredited hospitals followed the above procedures for quality improvement.

Best Practices for Continuous Quality Management:

Best practices for continuous quality management were observed in ***District Hospital, Baramulla; Manipal Hospital; Fortis hospital, Jaipur; Max Super Speciality Hospital; Apollo Hospital; Care Hospital; Yashoda Hospital, Malakpet; Paras HMRI Hospital; Ramakrishna Care Hospital; Medeor Hospital*** and ***Artemis Hospital.***

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 analysing 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.

A) Hospital-wise comparison:

Out of 100 studied hospitals 52 hospitals did not had any electronic health record (EHR) and other hospitals had EHR system.

Table 32: Summary of Data Management System by Category of Hospitals

Computerized Data Management System	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
EHR	6	11	3	7	6	7	5	6	9	12	8	0	18	2	0
Patient Registration System	15	2	3	17	0	3	10	2	8	20	0	0	20	0	0
Patient Clinical Examination Notes	2	1	17	3	1	16	0	1	19	6	5	9	6	5	9
Patient Investigation Lab Reports	10	3	7	7	4	9	4	3	13	16	2	2	18	1	1
Patient Radiological Investigation Reports	12	3	5	10	2	8	3	5	11	18	2	0	16	2	2
Trauma Registry	2	5	13	3	5	12	1	2	17	6	3	11	7	5	7
Injury Surveillance System	0	2	18	0	3	17	2	0	18	2	3	14	4	4	11
ED Surveillance System	1	3	16	0	4	16	1	1	18	9	1	10	7	3	9
Data Retrieval System	3	4	13	4	8	8	2	3	15	12	2	6	12	2	5

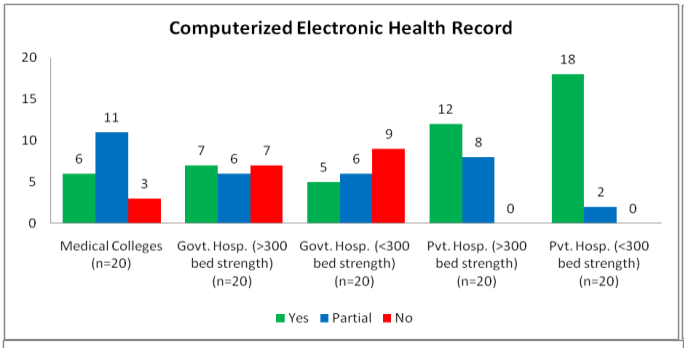
*n: number of hospitals, ED: Emergency Department, EHR: Electronic Health Record

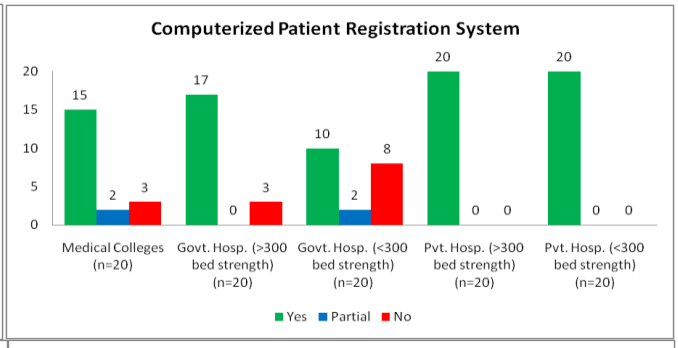
In addition, it was also observed that 19 hospitals have trauma registry, only 8 hospitals have injury surveillance system, 18 hospitals have emergency department surveillance system, and 33 hospitals have data retrieval system for quality improvement & research.

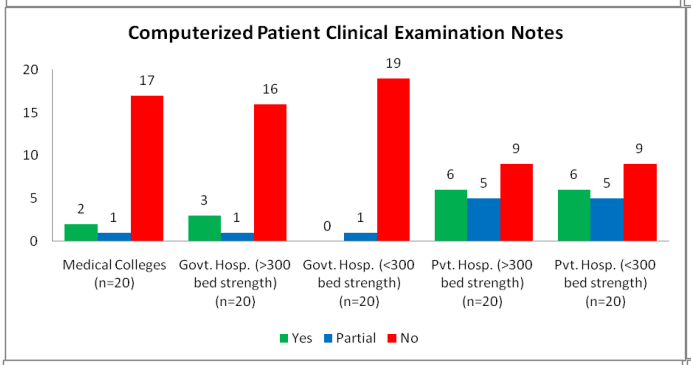
Out of 20 medical colleges, 6 hospitals had electronic health record (EHR), 15 hospitals had computerized patient registration system, only 2 hospitals (AIIMS, Bhopal and IPGMER & SSKM Hospital) had computerized patient clinical examination notes, 10 hospitals had computerized patient investigation lab reports and 12 hospitals had computerized patient radiological investigation reports.(Note: Though hospitals have answered yes for trauma registry but many of them do not understood it's meaning).

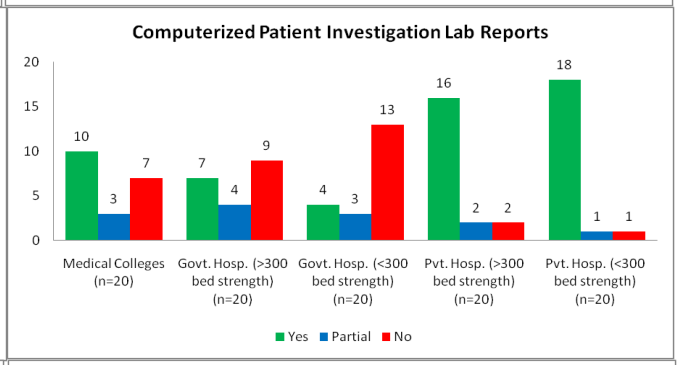
In addition, it was also observed that 2 hospitals (AIIMS, Bhopal and IPGMER & SSKM Hospital) had trauma registry, none of them had injury surveillance system, 1 hospital (AIIMS, Bhopal) had emergency department surveillance system, and 3 hospitals (Civil Hospital, Ahemdabad; AIIMS, Bhopal and JIPMER, Pondicherry) had data retrieval system for quality improvement & research (table 32 and figure 38).

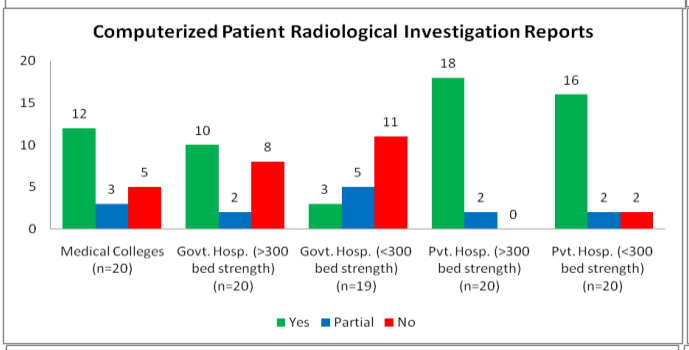
Figure38: Comparison of Data Management System by Hospital Categories

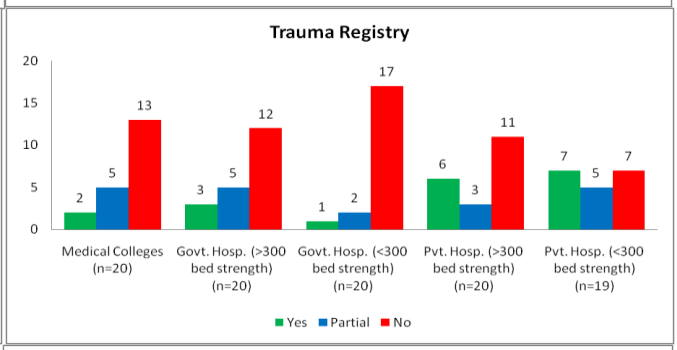


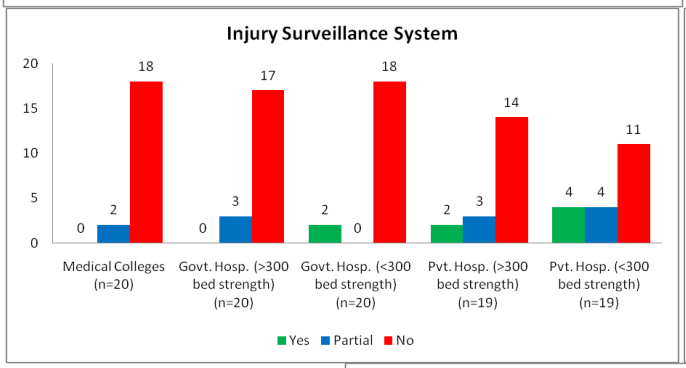


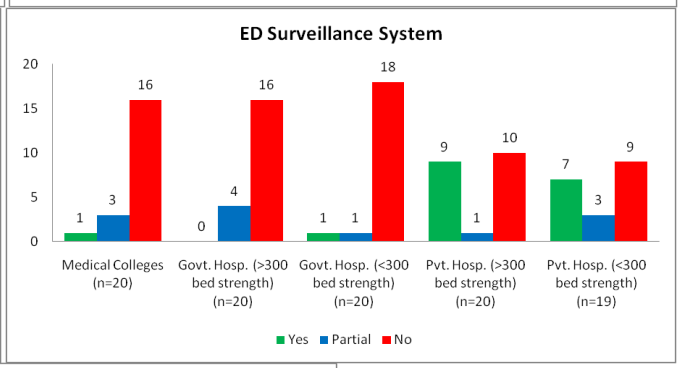


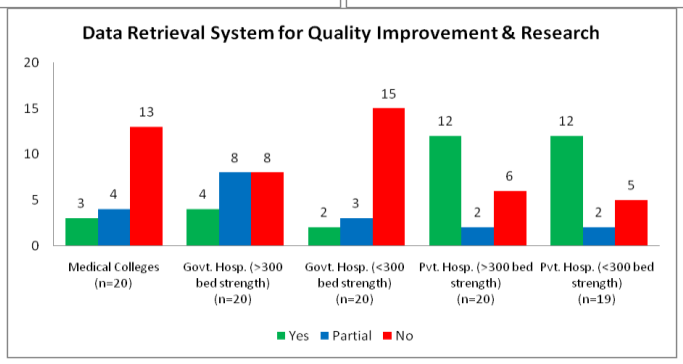












Out of 20 government hospital >300 beds, 7 hospitals had electronic health record (EHR), 17 hospitals had computerized patient registration system, only 3 hospitals (Dr Shyam Prasad Mukharji Civil Hospital, Lucknow; AIIMS, Patna and Jai Prakash Narayan District Hospital, Bhopal) had computerized patient clinical examination notes, 7 hospitals had computerized patient investigation lab reports and 10 hospitals had computerized patient radiological investigation reports.

In addition, it was also observed that 3 hospitals (AIIMS, Patna; Civil Hospital, Shillong and HNB Base Hospital) had trauma registry, none of them had injury surveillance system and emergency department surveillance system, and 4 hospitals (AIIMS, Bhubneshwar; District Hospital, Baramulla, J&K; Dr Shyam Prasad Mukharji Civil Hospital, Lucknow and Deen Dayal Upadhyay Hospital, H.P.) had data retrieval system for quality improvement & research.

Out of 20 government hospital <300 beds, 5 hospitals had electronic health record (EHR), 10 hospitals had computerized patient registration system, none of them had computerized patient clinical examination notes, 4 hospitals had computerized patient investigation lab reports and 3 hospitals had computerized patient radiological investigation reports.

In addition, it was also observed that 1 hospital (Puri District Headquarter Hospital, Orissa) had trauma registry, 2 hospitals (Puri District Headquarter Hospital, Orissa and Dr Jogalekar Hospital, Pune) had injury surveillance system, 1 hospital (Dr Jogalekar Hospital, Pune) had emergency department surveillance system, and 2 hospitals (Civil Hospital, Aizawl, Mizoram and Dr Jogalekar Hospital, Pune) had data retrieval system for quality improvement & research.

Computerized data management system found weak in government sector especially in government hospitals less than 300 bed strength.

Trauma registry, injury surveillance system, emergency department surveillance system, and data retrieval system for quality improvement & research were found weak in all categories of the healthcare facilities (table 32 and figure 38).

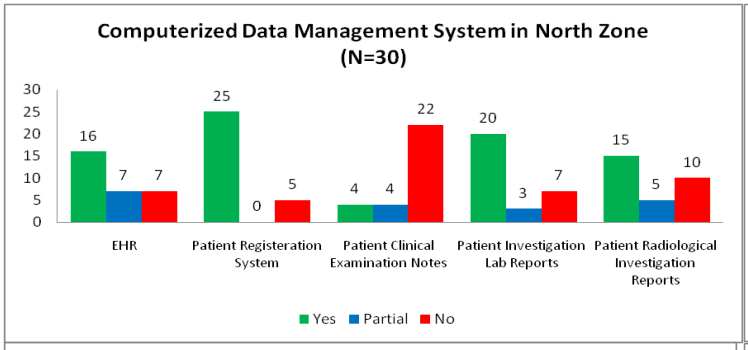
B) Zone-wise comparison:

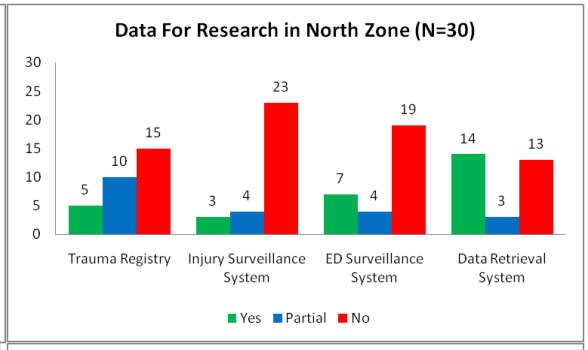
Table 33: Zone-wise Summary of Data Management System in Hospitals

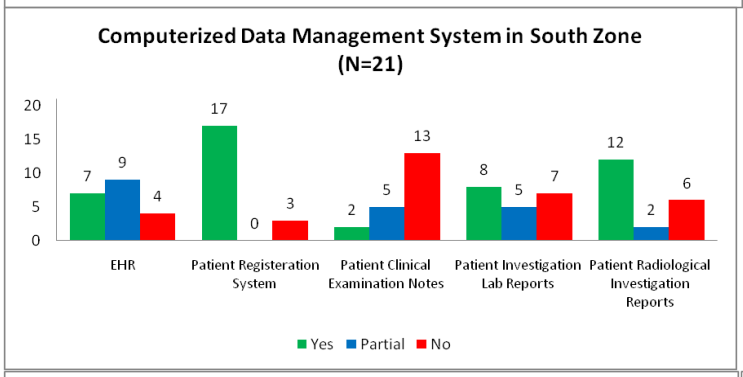
Data Management System	North (n=30)			South (n=21)			East (n=11)			West (n=16)			North East (n=22)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
EHR	16	7	7	7	9	4	7	2	2	11	4	1	6	11	5
Patient Registration System	25	0	5	17	0	3	9	0	2	14	1	1	16	3	3
Patient Clinical Examination Notes	4	4	22	2	5	13	4	2	5	5	2	9	1	1	20
Patient Investigation Lab Reports	20	3	7	8	5	7	6	1	4	11	2	3	9	1	12
Patient Radiological Investigation Reports	15	5	10	12	2	6	7	1	3	10	3	3	13	4	4
Trauma Registry	5	10	15	2	4	14	6	1	4	4	2	9	1	2	19
Injury Surveillance System	3	4	23	0	3	16	3	3	4	1	2	12	0	0	22
ED Surveillance System	7	4	19	3	4	12	3	3	5	4	0	11	0	0	22
Data Retrieval System	14	3	13	5	7	7	5	2	4	6	4	5	2	3	17

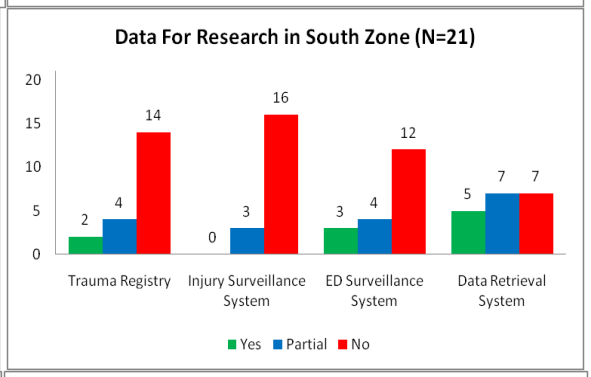
*n: number of hospitals, ED: Emergency department, EHR: Electronic Health Record

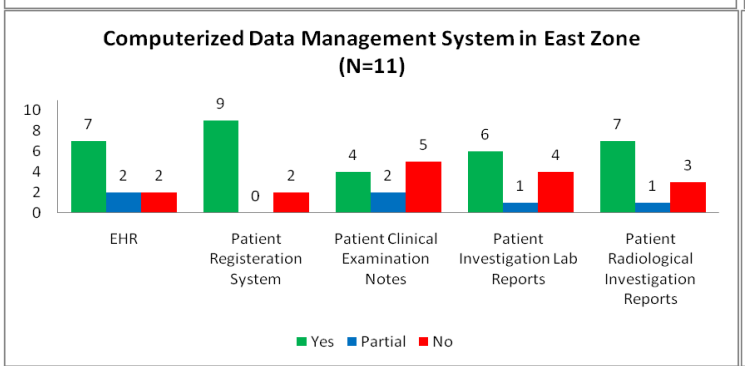
Figure 39: Zone-wise Comparison of Data Management System in Hospitals

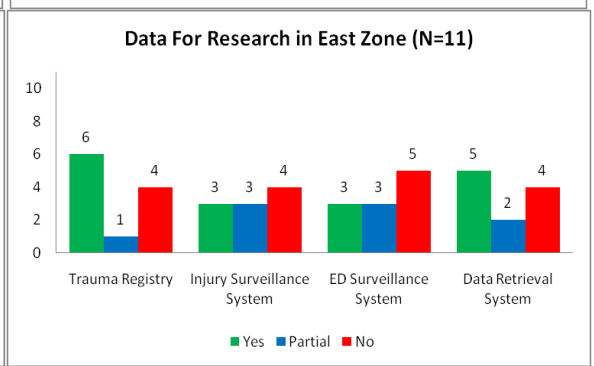


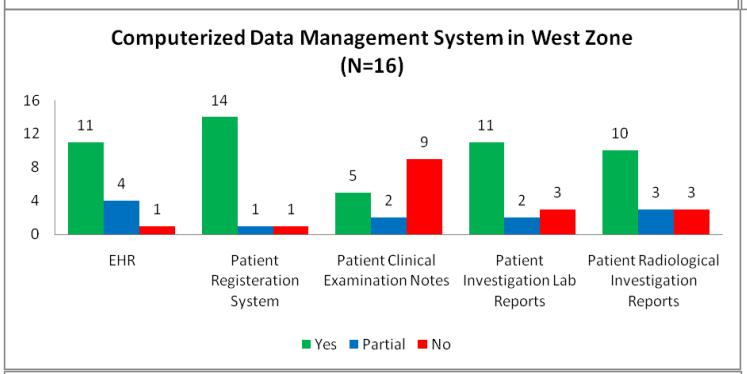


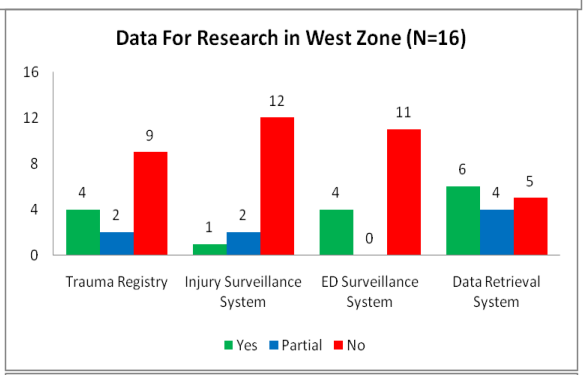


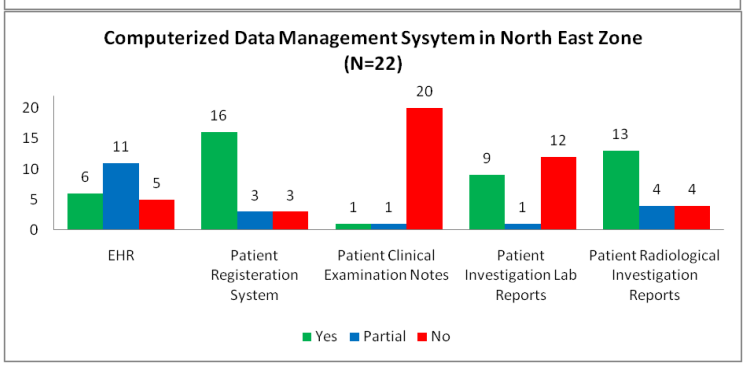


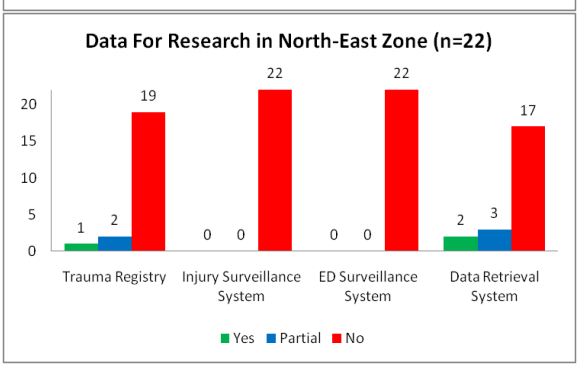










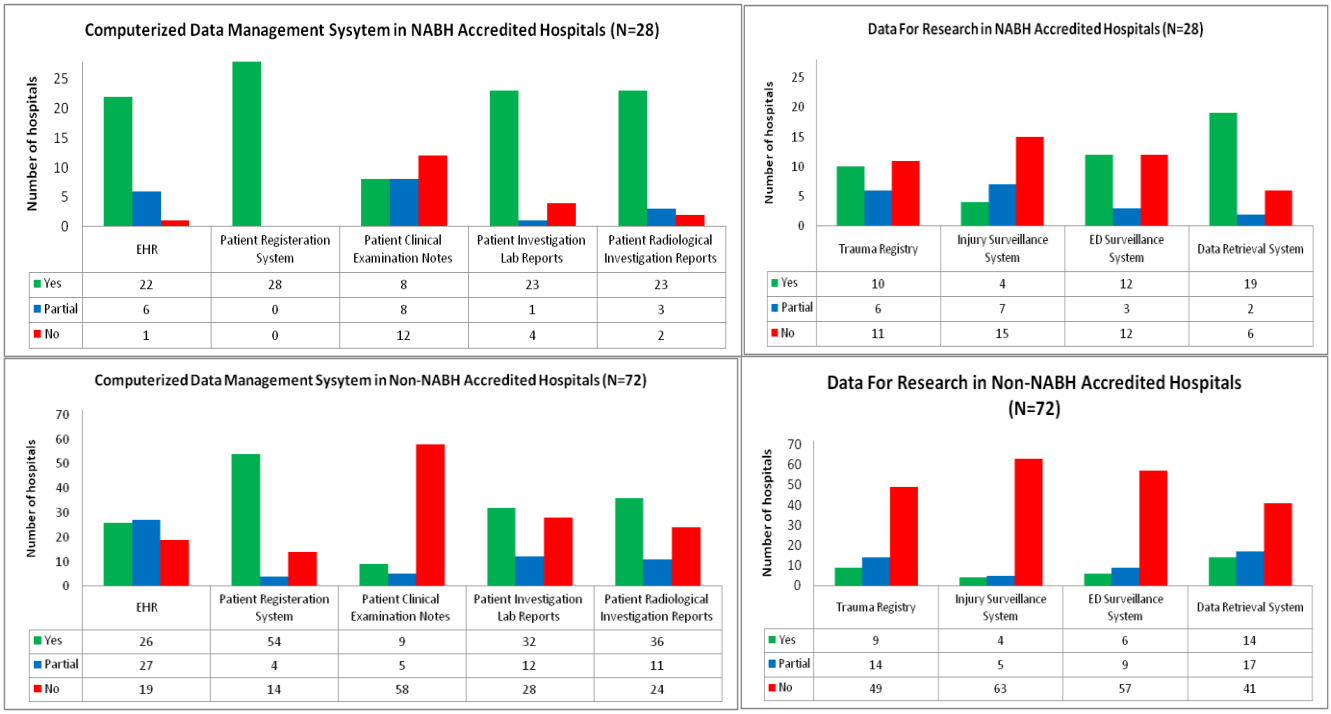


Out of all five zones of India, north east was found weak in sector of computerized data management system.

C) NABH and non-NABH Accredited Hospitals comparison:

In addition, it was observed that data management is good in NABH Accredited Hospitals but the data for research was found below average (figure 40).

Figure 40: Comparison of Data Management System in NABH and Non-NABH Accredited Hospitals



Best Practices for Data Management System was observed in ***Ruban Memorial Hospital, Asian Hospital,*** and ***Primus Super Speciality Hospital*** (with 100% score).

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:

Availability of dedicated funds for emergency department assessed for all hospitals. Out of 60 government healthcare facilities, only 2hospitals received sufficient central government funds, 13 did not received sufficient central government funds and the rest did not received any fund at all for ED services.

A) Hospital-wise comparison:

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.

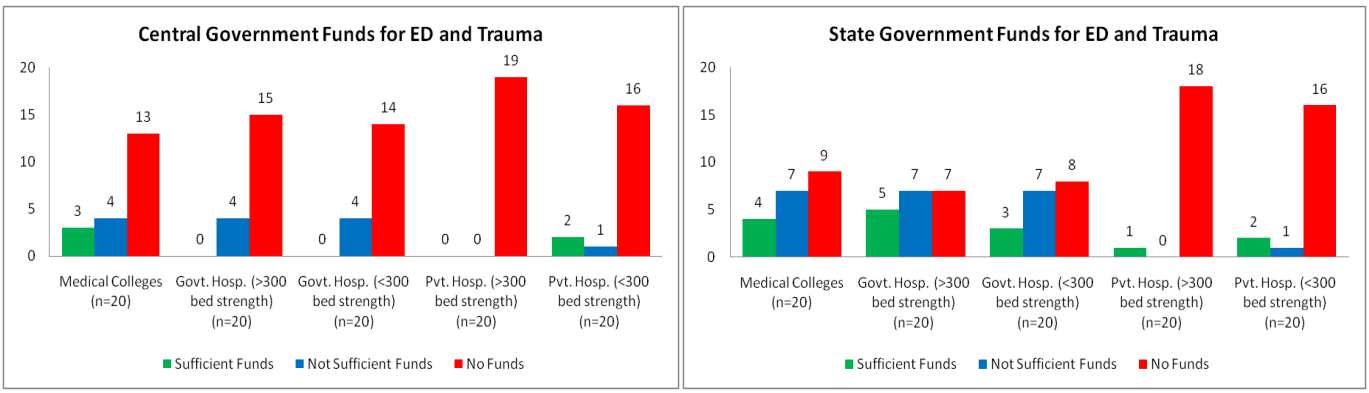
Table34: Overall Summary of Financing by Category of Hospitals

Financing for Emergency Department	Medical Colleges with ED Academics (n=3)			Medical Colleges with Emergency Services (n=17)			Govt. hospitals (<300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)		
	SF	NSF	NF	SF	NSF	NF	SF	NSF	NF	SF	NSF	NF
Central Govt Funds for ED Services	0	1	1	2	3	12	0	4	15	0	4	14
State Govt Funds for ED Services	2	0	1	3	7	7	5	7	7	3	7	8

(**SF: Sufficient Funds, NSF: Not Sufficient Funds, NF: No Funds, n: number of hospitals)

Out of these two, one state give funds only for trauma not for emergency

Figure 41: Comparison of Financing by Hospital Categories



Out of 3 medical colleges with academic emergency department, 2 had received sufficient funds from state government- a) funds for trauma (JIPMER, Pondicherry) b) funds from Government of Gujarat(Civil Hospital, Ahmedabad).

Out of 17 medical colleges without academic emergency department, 2 hospitals (Regional Institute of Medical Sciences, Imphal and AIIMS, Bhopal) had sufficient funds, 3 hospitals (Government General Hospital, Guntur; Government Medical College, Thiruvananthapuram and Patna Medical College

& Hospital, Patna) had funds but not sufficient and 12 hospitals had no funds from central government.

B) Zone-wise comparison:

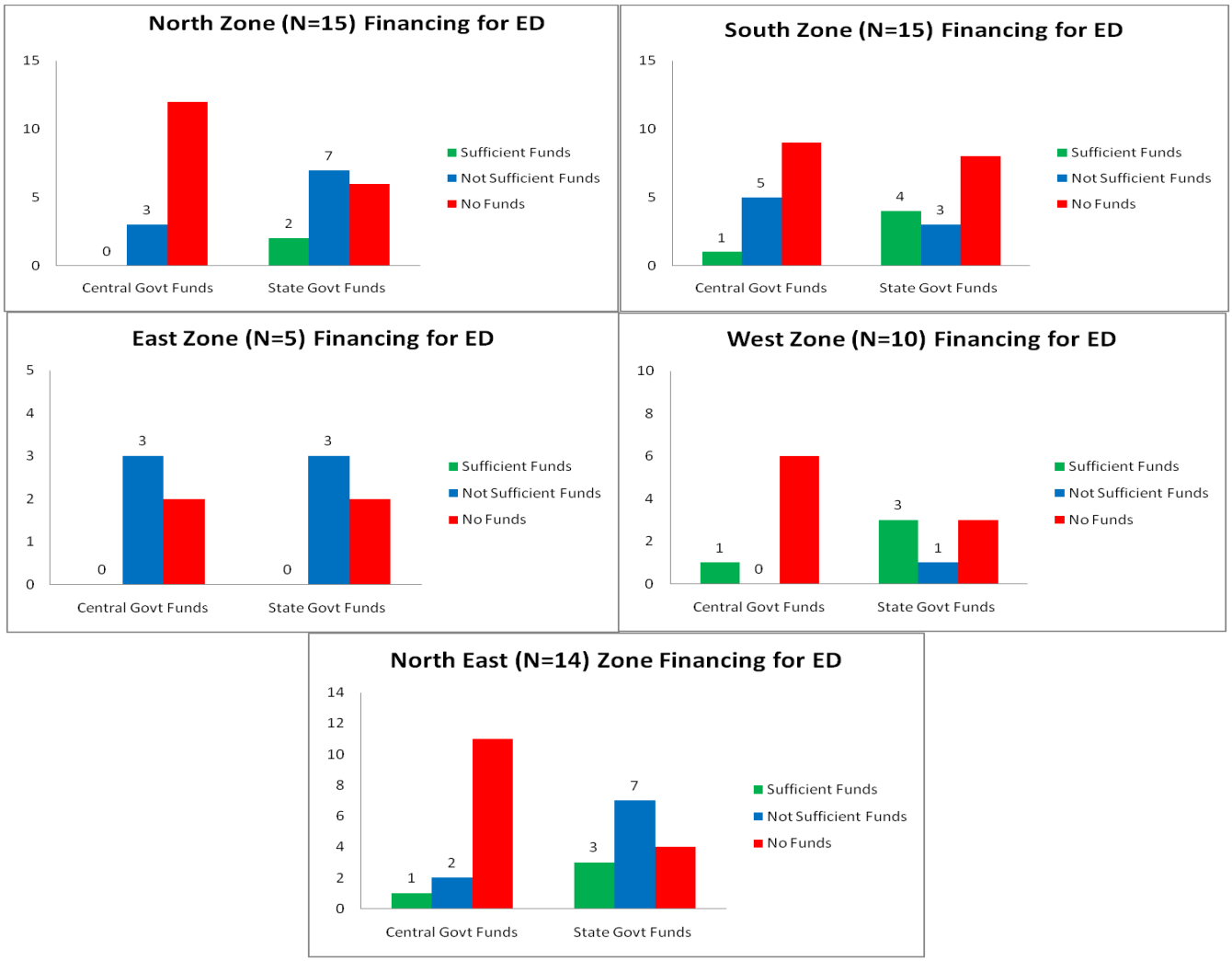
Out of 100 hospitals from five zones of country, it was observed that east zone was the weakest zone for receiving funds from government either state or central.

Table 35: Zone-wise Summary of Financing in Hospitals

Financing for ED	North (n=15)			South (n=15)			East (n=5)			West (n=10)			North East (n=14)		
	SF	NSF	NF	SF	NSF	NF	SF	NSF	NF	SF	NSF	NF	SF	NSF	NF
Central Govt Funds for ED Services	0	3	12	1	5	9	0	3	2	1	0	6	1	2	11
State Govt Funds for ED Services	2	7	6	4	3	8	0	3	2	3	1	3	3	7	4

(* n= number of government hospitals in respective zones, ED= Emergency Department)
(**SF: Sufficient Funds, NSF: Not Sufficient Funds, NF: No Funds)

Figure 42: Zone-wise ccomparison of Financing in Hospitals



C) Status of funds:

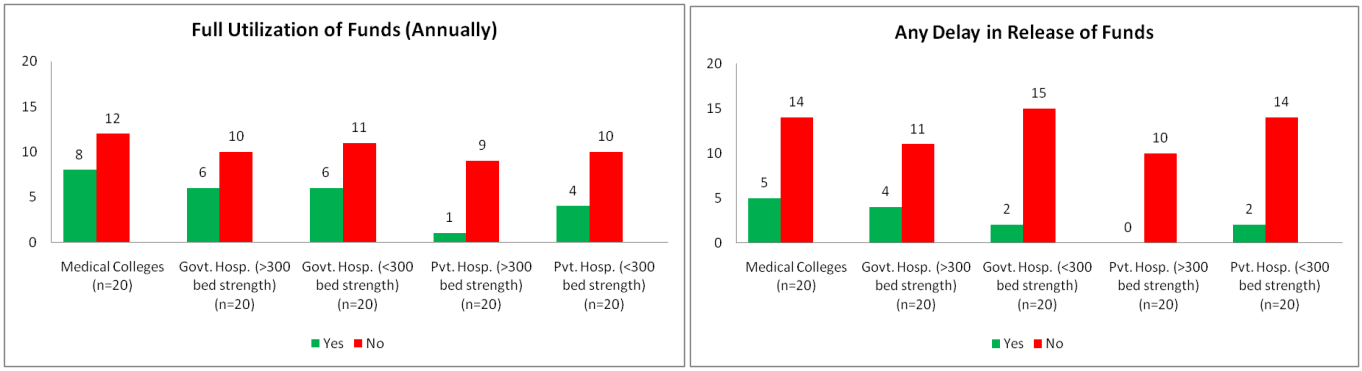
It was observed that some hospitals received funds on time others did not received on time and in most of the hospital's funds are not fully utilized as depicted in the below table and figure.

Table 36: Overall Summary of Financial Status by Category of Hospitals

Financial Status	Medical Colleges (n=19)		Govt. hospitals (>300 bed strength) (n=15)		Govt. hospitals (<300 bed strength) (n=17)		Pvt. hospitals (>300 bed strength) (n=10)		Pvt. hospitals (<300 bed strength) (n=16)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Full Utilisation of Funds	8	10	6	9	6	11	1	9	4	9
Delay in Release of Funds	5	14	4	11	2	15	0	10	2	14

(* n= number of government hospitals in respective zones)

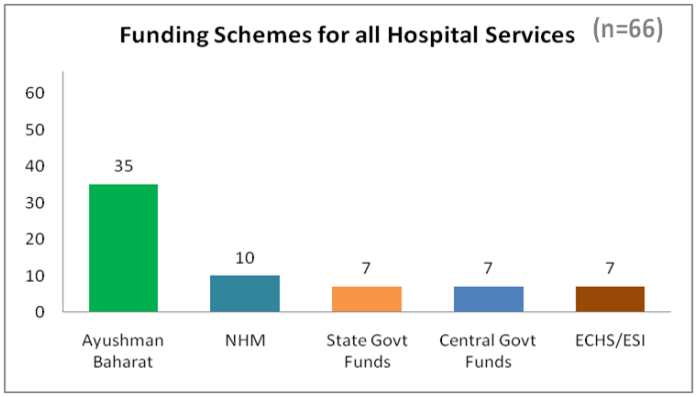
Figure 43: Overall Comparison of Financial Status by Hospital Categories



D) Funding Schemes:

The studied hospitals received funds from central and state government under several funding schemes. Most of the funding schemes cover trauma care services and other hospital services. From the entire studied funding schemes, one major funding scheme was Ayushman Bharat. Out of 100 hospitals, 66 hospitals received funds from either state or central government.

Figure 44: Funding Schemes by Category of Hospitals

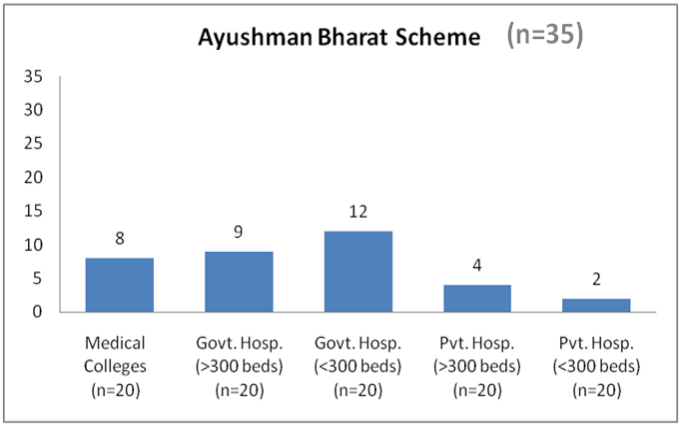


E) Ayushman Bharat (PMJAY):

Ayushman Bharat provides coverage for 35 hospitals in both government and private sector out of 100 hospitals. It covers 8 medical college, 9 government hospitals (>300 beds), 12 government hospitals (<300 beds), 4 private hospitals (>300 beds), and 2 private hospitals (<300 beds) as shown in figure 45.

Figure 45: Comparison of Ayushman Bharat Scheme by Category of Hospitals

Hospital Category	Bed strength	n	Number of Hospitals	Percentage per category
Medical Colleges	>500	20	8	40%
Govt. Hospital	>300	20	9	45%
Govt. Hospital	<300	20	12	60%
Pvt. Hospital	>300	20	4	20%
Pvt. Hospital	<300	20	2	10%



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 members provide 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.

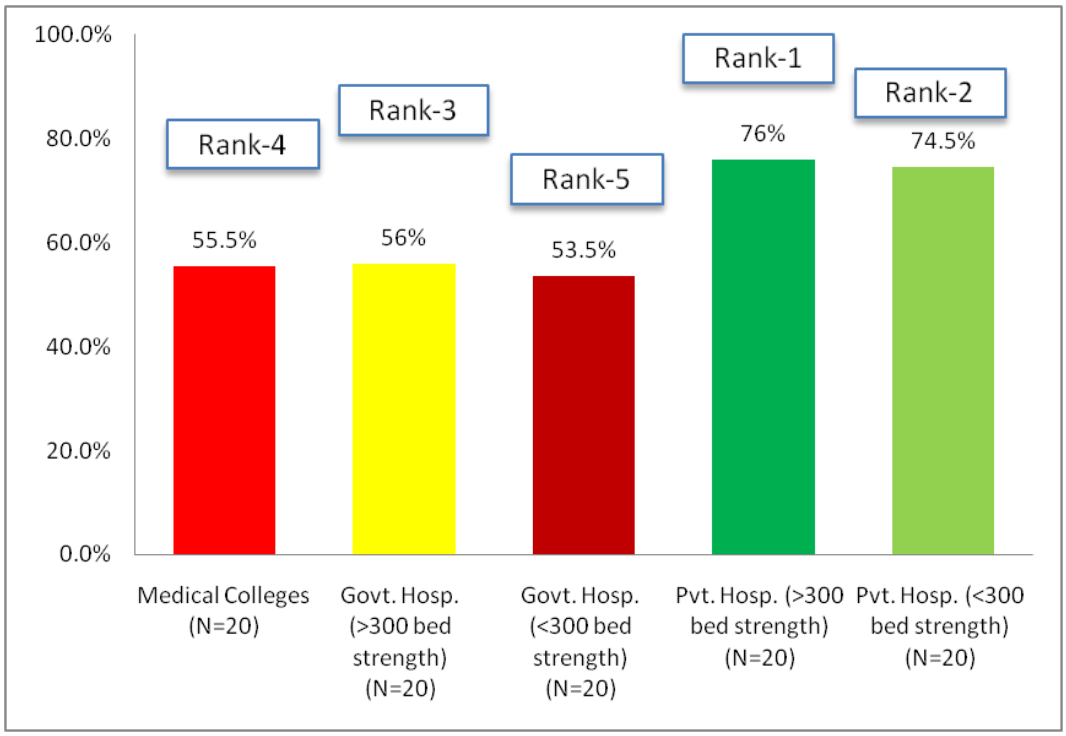
In this study, consensus based tool was developed which includes a checklist for physical infrastructure of Emergency Department. The observations of physical infrastructure are given in the table 37and figure 46.

Table 37: Summary of Physical Infrastructure by Hospital Categories

Hospital Category	Medical Colleges (n=20)	Govt. Hosp. (>300 bed strength) (n=20)	Govt. Hosp. (<300 bed strength) (n=20)	Pvt. Hosp. (>300 bed strength) (n=20)	Pvt. Hosp. (<300 bed strength) (n=20)
Physical Infrastructure	55.5%	56%	53.5%	76%	74.5%

*n=number of hospitals

Figure 46: Comparison of Physical Infrastructure for Emergency Department by Category of Hospitals



Out of 10 critical checklist points assessed for emergency department for all the hospitals, the overall compliance was as follows:

- ✓ **Separate access for ambulance services (45%)**
- ✓ **Designated area for ambulances (58%)**
- ✓ **Demarcated triage area (35%)**
- ✓ **Emergency department with adequate space (48%)**

- ✓ **Dedicated minor OT (63%)**
- ✓ **Point of care lab (26%)**
- ✓ **Police control room (44%)**
- ✓ **Smooth entry area with wheel chair, etc (63%)**
- ✓ **Adequate waiting area (63%)**
- ✓ **Safe drinking water (63%)**

Other 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 37% hospitals parked vehicle in front of ER and 25% hospitals showed partial compliance to this objective.

The hospitals (48%) showed compliance, 26% 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 most government hospitals was found to attend only critical and unattended patients from ambulances. The information board displaying services being provided was found missing from 13% hospitals and 24% 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 government hospitals. 51% hospitals have adequate waiting area. Mostly hospitals had functional male and female toilets but only 38% hospitals have functional toilets with wheel chair. Police post was available in 56% of hospitals.

Out of 100 hospitals, 48 hospitals had designated emergency rooms, 29 hospitals did not have proper designated emergency room and 23 hospitals did not have any emergency room. Only 34 hospitals had demarcated area for triage.

Only 23 hospitals had isolation room in emergency. Similarly the point of care lab was found in only 26 hospitals *(6 medical colleges, 3 government hospital >300 beds, 1 government hospital <300 beds, 10 private hospitals >300 beds and 6 private hospitals <300 beds).*

Out of 100 hospitals, no separate room was present for sexual assault victim in 64 hospitals, no availability of forensic evidence kit for them in 58 hospitals and no counselling service for sexual assault / domestic violence cases in 57 hospitals.

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 standardizing** 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 **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 government hospitals.

The manpower in emergency was recorded and it was observed that many government hospitals had very 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.

Table 38: Summary of Manpower in Emergency Department Category of Hospitals

Hospital Categories	Medical Colleges (n=20)	Govt. Hosp. (>300 bed strength) (n=20)	Govt. Hosp. (<300 bed strength) (n=20)	Pvt. Hosp. (>300 bed strength) (n=20)	Pvt. Hosp. (<300 bed strength) (n=20)
Doctors	3	7	15	12	50
Nurses	2	3	4	10	11
Technicians	1	6	6	11	17
Support Staff	3	4	10	14	22

Table 39: Detailed Summary of Manpower in Emergency Department by Category of Hospitals

Overall Manpower in Emergency	Medical Colleges (n=20)		Govt. Hosp. (>300 bed strength) (n=20)		Govt. Hosp. (<300 bed strength) (n=20)		Pvt. Hosp. (>300 bed strength) (n=20)		Pvt. Hosp. (<300 bed strength) (n=20)	
	Median [IQR] Min-Max	% Per footfall of 100 patients in ED	Median [IQR] Min-Max	% Per footfall of 100 patients in ED	Median [IQR] Min-Max	% Per footfall of 100 patients in ED	Median [IQR] Min-Max	% Per footfall of 100 patients in ED	Median [IQR] Min-Max	% Per footfall of 100 patients in ED
Faculty / Consultant	3 [3] 1-8	0.19	6 [7.7] 1-39	2.53	2 [3.7] 1-33	6.41	2 [2] 1-138	1.19	2 [4] 1-80	9.44
Casualty Medical Officer	5.5 [3.5] 1-20	0.23	5 [6.5] 1-16	0.46	2 [4.2] 1-12	1.27	4 [2] 1-13	1.80	2 [5] 1-9	1.71
Senior Resident	8 [8] 2-20	0.43	7 [2.5] 3-18	1.57	0	0	1.5 [13] 1-30	1.50	3 [3] 1-20	6.79
Junior Resident	9.5 [6.2] 2-24	0.81	7 [9.5] 2-30	1.10	1 [0] 1-1	0.39	4 [7] 1-167	2.72	5 [9] 2-26	14.47
Medical Officer	4 [4] 1-51	0.23	4 [3.5] 3-9	0.51	6 [4] 1-8	3.09	4 [7.2] 1-11	2.40	2 [5] 1-18	3.76
Intern	6.5 [3.7] 2-18	0.69	5 [6] 2-40	0.97	12 [8] 4-20	4.34	4 [85] 3-100	2.24	22 [0] 22-22	13.47
Nursing officer Incharge	3 [2] 1-33	0.19	2 [1] 1-18	0.30	1 [1.7] 1-10	0.61	2 [2] 1-4	0.75	1 [2] 1-4	0.85

Staff Nurse / Nursing officer	21 [11.5] 4-70	2.25	12 [9] 3-165	3.25	7 [6.2] 1-31	3.09	17.5 [24.7] 3-50	8.94	15 [5.7] 3-35	10.24
Radiology Technician	4 [4] 1-4	0.32	3 [2] 1-6	1.79	1 [2] 1-4	0.55	3 [6] 1-18	0.72	2 [2] 1-10	4.14
Lab Technician	3 [2] 1-18	0.20	3 [4] 2-12	1.29	3 [3.7] 1-12	2.28	9 [12] 1-31	2.67	3 [3] 1-12	5.52
OT Technician	3 [5.5] 1-10	0.39	2 [0] 1-2	0.87	2 [1] 1-3	2.73	10 [3] 6-12	4.79	2 [2] 1-14	3.78
H.A. / G.D. A.	6.5 [8.2] 1-19	0.92	4 [0] 4-4	1.30	1 [0.5] 1-2	2.46	4.5 [2] 3-10	4.60	4 [4] 1-12	8.05
Housekeeping Staff	12 [20.2] 2-60	0.57	3 [3] 1-20	1.20	3 [1.5] 1-4	3.72	7 [3.5] 2-152	4.08	7.5 [8.5] 3-20	3.27
EMT	6 [6.5] 2-27	0.46	3 [1] 1-30	1.67	3 [0.5] 1-16	0.65	6 [15.2] 2-55	2.60	5 [3.5] 1-30	3.67
Security	8.5 [10.5] 2-83	1.03	4 [5] 1-30	0.97	3 [2.7] 1-6	1.07	4 [3] 2-25	2.25	4 [3] 1-10	3.24
Registration Staff	3 [3.5] 1-19	0.26	3 [3.5] 1-35	0.50	2 [2.5] 1-5	0.88	4.5 [3.7] 1-22	2.04	3 [1] 1-10	2.49
Any Other	4 [0] 4-4	0.33	1.5 [0.5] 1-2	0.13	4 [0] 4-4	1.52	3 [0] 3-3	0.78	4 [2] 2-6	4.70

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

Note: *A total of 357 staff members including doctors were recorded for Civil Hospital, Ahemdabad (Medical College) in ED.*

21.1. Other Specialist / Super Specialist Available in Hospital:

In this study, the number of specialist and super specialist were also recorded for the whole healthcare facility. It was observed that the hospitals were having adequate number ofspecialist and super specialist in the hospital (Annexure VI) but the number of doctors in the emergency department was not enough.

The median of consultants as well as residents was found high in medical colleges during OPD hours. Emergency department is manned by junior doctors for caring of the sickest patients even though the hospitals had adequate specialists.

21.2. Discussion for Manpower in Emergency:

Table 40 depicts the gaps in manpower present in emergency or emergency department for the existing annual footfall. There are several gaps like, less number of available emergency beds and manpower, to manage patients in emergency department.

Table 40: Comparison of Emergency Cases and Manpower in categories of Hospitals

Healthcare Facilities	Bed Strength	Emergency and Injury Care Patients				% of Emergency and injury care Patients (ONE YEAR)	% of Emergency and injury care Patients (ONE DAY)	%of Available Emergency Beds
		n	Median	IQR	Min-Max			
Medical Colleges	>500	15	119461	140435	3560-477845	13%	17%	3%
Government Hospitals	>300	17	43001	118984	876-3088834	14%	11%	4%
Government Hospitals	<300	16	18738	35139	1560-227364	15%	11%	4%
Private Hospitals	>300	17	20161	22118	3676-103524	9%	10%	4%
Private Hospitals	<300	11	13800	4908	4800-8778	12%	30%	5%

Suggestions:

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

22. Equipment and Supplies in ED:

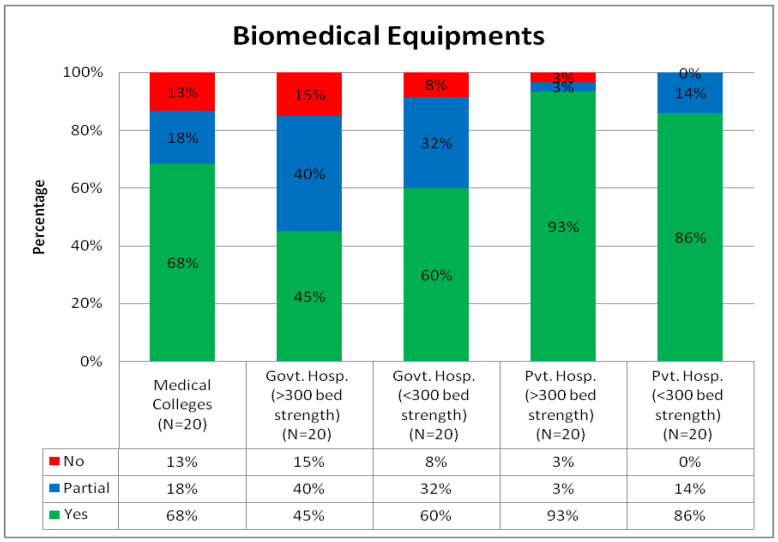
22.1. Biomedical Equipment:

It assesses the availability of the equipment in accordance with 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 69 hospitals and the inventory and log books are maintained properly in 67 hospitals. The records of periodically inspection and calibration were found in 66 hospitals out of 100 (Table 41). Figure 47 illustrates the above-mentioned points by category of hospitals.

Table 41: Summary of Biomedical Equipment by Category of Hospitals

Biomedical Equipment	List of equipments according to available services	Medical equipment inventory and log book	Periodically inspected & calibrated equipment Record
Yes	69	67	66
Partial	20	23	18
No	6	5	11

Figure 47: Compliance of Biomedical Equipment by Hospital Categories



It was observed that the equipments and supplies for ED were mostly present in private hospitals in comparison with the government hospitals as shown in the figure 48.

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 59% hospitals had mobile resuscitation beds, 39% hospitals had transport ventilators, 43% had Laryngeal Mask Airway, 50% hospitals had vaginal speculum, and only 24% hospitals had capnography.

In addition, 28% hospitals had incubators, 28% hospitals had emergency cricothyroidotomy kit, 25% hospitals had emergency thoracotomy set, 23% hospitals had emergency decompressive craniotomy set, only 17% hospitals had emergency thrombectomy sets, and 25% hospitals had phototherapy unit (table 42).

Figure 48: Comparison of Equipments and Supplies present in ED by Category of Hospitals i) on the basis of Percentage range ii) Ranking on the basis of Overall Performance

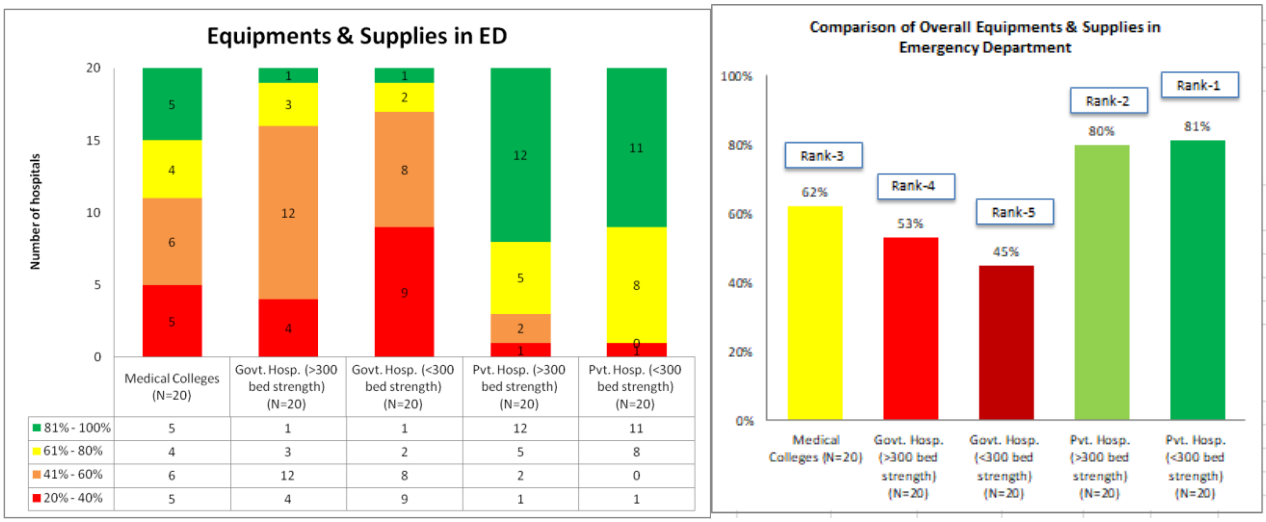


Table42: Overall Summary of Equipments and Supplies list in ED for 100 Healthcare Facilities by Category

Equipments& Supplies in ED	Medical Colleges (n=20)			Govt. Hospitals (>300 bed strength) (n=20)			Govt. Hospitals (<300 bed strength) (n=20)			Pvt. Hospitals (>300 bed strength) (n=20)			Pvt. Hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Mobile bed for resuscitation	10	2	8	10	4	6	4	2	14	17	1	2	19	0	1
Crash cart	12	5	3	11	5	4	11	5	4	17	2	1	19	0	1
Hard cervical collar	9	0	11	5	3	12	3	0	16	16	0	4	16	1	3
Oxygen supply by pipeline	15	2	3	15	0	5	4	1	15	19	1	0	18	0	2
Oxygen cylinder	18	1	1	19	1	0	19	0	1	19	1	0	20	0	0
Suction machine	16	3	0	19	1	0	18	1	1	18	2	0	20	0	0
Multipara monitor	15	12	4	13	1	6	9	4	7	18	1	1	18	1	1
Simple/transport monitor	10	3	7	12	1	7	7	3	10	16	1	3	19	0	1
Defibrillator	13	5	2	13	2	5	8	6	6	18	1	1	18	1	1
All types of forceps	11	3	6	10	5	4	9	5	6	17	3	0	18	2	0
Transport ventilator	7	1	12	4	1	15	2	2	16	14	2	4	13	2	5
AMBU bag	17	2	1	15	5	0	16	2	2	18	2	0	17	1	1
Suprapubic cathetor	8	4	8	4	1	15	2	1	17	14	1	5	13	0	7
Light source	10	1	9	12	2	6	12	2	6	16	1	3	18	1	1
Stethoscopoe	14	3	3	18	0	1	19	1	0	18	1	1	19	0	0

Oropharyngeal airway blades	14	3	3	14	4	2	10	4	6	20	0	0	19	0	1
LMA (Lanryngeal Mask Airway)	9	0	11	3	2	15	2	1	16	15	0	5	14	0	6
Tourniquet	12	1	7	12	2	6	9	0	11	16	1	3	19	0	0
Pelvic binder & bed-sheets with clips	6	4	10	2	3	15	4	1	15	12	0	8	13	0	7
Needle holder and suture material	15	3	2	17	1	1	13	6	1	19	1	0	20	0	0
Vaginal speculum	8	3	9	6	3	10	9	3	8	13	2	5	14	0	5
Ryles tubes	13	6	1	13	7	0	13	6	1	19	1	0	18	0	2
Foley's catheter	13	5	2	13	7	0	12	7	1	19	1	0	18	0	2
Laryngoscope	14	6	0	15	4	1	12	5	3	19	1	0	18	1	1
Endotracheal tubes	14	6	0	16	4	0	10	6	4	18	2	0	19	0	1
Chest tubes with water seal drain	11	5	4	7	4	8	3	3	14	18	1	1	16	1	3
Blood pressure monitor	17	2	1	17	2	1	17	3	0	19	1	0	20	0	0
ECG machine	17	3	0	17	2	1	17	1	2	20	0	0	20	0	0
Ultrasonic nebulizer	12	3	5	10	4	5	7	2	11	15	2	3	18	0	2
IV cannula and IV infusion sets	16	2	2	15	5	0	19	1	0	19	1	0	19	1	0
Syringes and disposable needles	17	2	1	19	1	0	20	0	0	20	0	0	19	1	0
Broselow tape	1	2	16	0	1	18	2	1	16	11	0	9	10	0	10
Protoscope	14	1	5	8	1	11	8	2	10	16	1	3	15	0	5
Fluid Warmer	3	2	15	3	0	17	2	4	14	7	2	11	10	0	10
Dressing sets	6	4	0	17	2	1	11	5	4	19	1	0	20	0	0
Personal protecting equipments	11	8	1	14	4	2	10	7	2	18	2	0	18	1	1
Central line of all sizes	9	3	8	2	5	12	2	2	16	16	3	1	17	1	2
Capnography	5	3	12	2	1	16	1	2	17	8	3	9	9	1	10
Infusion pump and syringe drivers	10	2	8	7	1	12	5	1	14	18	2	0	19	0	1
Spine board with sling & scotch tape all sizes	5	2	13	6	2	12	1	1	17	13	0	7	16	0	4
Splints for all fractures	9	8	3	5	10	5	3	7	10	14	3	3	15	3	2
Non-invasive and invasive ventilators	10	2	8	3	4	13	3	2	15	16	3	1	15	1	4
Incubators	9	2	7	2	1	17	1	2	17	8	3	9	9	2	9
Emergency Cricothyroidotomy kit	7	1	12	2	1	17	1	2	17	8	2	10	11	1	8
Emergency Thoracotomy set	7	0	13	2	1	16	1	0	19	8	1	11	8	2	10
Emergency Decompressive craniotomy sets	7	1	11	2	1	17	1	0	19	6	3	11	8	2	10
Emergency Thrombectomy sets	4	0	15	0	2	18	0	0	20	7	1	12	6	2	11
Phototherapy unit	9	2	7	1	1	17	3	2	15	5	3	12	8	2	10

*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 (43%)
   - ✓ Endotracheal tubes (76%)
   - ✓ AMBU bag (84%)
   - ✓ Transport ventilator (39%)
   - ✓ Laryngoscope (77%)
   - ✓ Oropharyngeal airway blades (75%)
   - ✓ Capnography (24%)
   - ✓ Emergency Cricothyroidotomy kit (28%)
   - ✓ Peak Expiratory Flow (16%)
2. **Breathing equipments:**
   - ✓ Emergency Thoracotomy set (25%)
   - ✓ Chest tube with seal drain (53%)
   - ✓ Ultrasonic nebulizer (61%)
   - ✓ Oxygen cylinder (93%)
   - ✓ Oxygen supply by pipeline (70%)
   - ✓ Suction machine (90%)
   - ✓ Non-invasive and invasive ventilator (45%)
3. **Circulation equipments:**
   - ✓ Multipara monitor (68%)
   - ✓ Transport monitor (39%)
   - ✓ Pelvic binder or bed-sheets with clips (37%)
   - ✓ Fluid warmer (25%)
   - ✓ Portable Ultrasound machine (36%)
   - ✓ Central line of all sizes (44%)
   - ✓ Infusion pumps and syringe driver (58%)
   - ✓ Defibrillator (68%)
4. **General equipments:**
   - ✓ Mobile bed for resuscitation (59%)
   - ✓ Crash cart (70%)
   - ✓ ED blood storage (18%)
   - ✓ Hard cervical collar (48%)
   - ✓ Spine board with slings (40%)
5. **Pediatric equipments:**
   - ✓ Broselow tape (24%)
   - ✓ Phototherapy Unit (25%)
   - ✓ Incubators (28%)

Suggestions:

1. All essential equipments and supplies should be present in emergency department of every hospital.
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

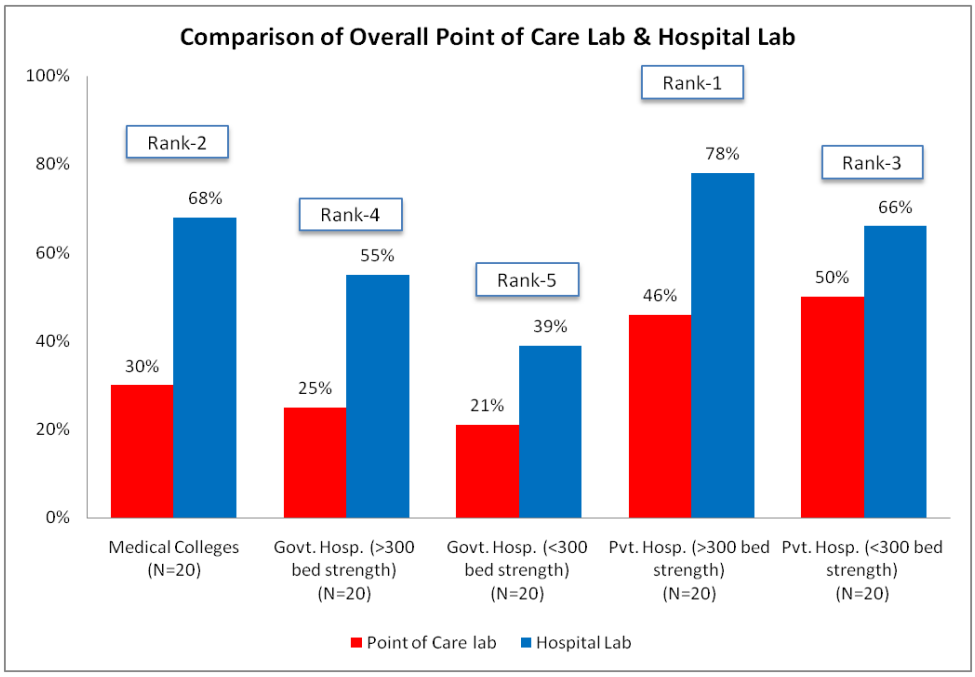
23. Point of Care Lab:

Point of care lab for ED was observed in only 18 hospitals out of all 100 hospitals. Most of the hospitals performed these tests in emergency labs:

1. Random blood sugar (74%)
2. Pregnancy test (56%)
3. Urinary ketones (49%)
4. Hemogram (46%)
5. Electrolyte (44%)
6. Blood urea & serum creatinine (44%)

Point of care lab and hospital labs did not perform the entire listed test of annexure-4 of study tool. D-dimer, Pro-BNP, plasma ketones, toxicology screening-urinary, serum osmolality, urine osmolality, TEG and PEF also did not performed by most of the hospitals as shown in table 43, 44 and figure 49.

Figure 49: Overall Compliance of Point of Care Lab for ED & Hospital



Best Practices for Point of Care Lab in ED: It was observed that only 2 hospitals performed all types of laboratory investigations for emergency department; *Ramakrishna Care hospital* and *Primus Super Speciality Hospital*.

Table43: Summary of Point of Care Lab by Category of Hospitals

Point of care lab in ED	Medical Colleges (n=20)			Govt. Hospitals (>300 bed strength) (n=20)			Govt. Hospitals (<300 bed strength) (n=20)			Pvt. Hospitals (>300 bed strength) (n=20)			Pvt. Hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Hemogram- Hb, Hct, TLC, DLC, Platelet	10	0	8	8	0	8	9	0	10	9	3	7	10	0	7
Random blood Sugar	16	0	3	13	0	4	14	1	4	17	0	2	14	0	3
Coagulation profile: PT, APTT, INR	3	0	11	5	1	10	6	0	13	7	2	9	10	0	7
Electrolytes: Na, K, Cl,Ca	9	0	10	7	0	9	7	1	11	11	2	6	10	0	7
Blood Urea & Serum Creatinine	11	0	8	6	0	9	8	0	11	8	3	7	10	0	7
Blood Gas Analysis	6	2	11	6	1	9	1	1	17	13	2	4	11	0	6
Cardiac enzymes, Trop-I, Trop-T	7	3	9	4	1	11	5	0	14	11	4	3	11	0	6
Serum Amylase	7	1	11	5	0	10	2	2	15	5	3	10	10	0	7
D-Dimer	1	1	16	2	0	13	1	0	18	6	2	10	9	0	8
Pro-BNP	0	1	17	2	0	13	1	0	18	4	2	12	10	0	7
Urinary ketones	9	1	9	9	0	8	7	1	11	12	2	5	12	0	5
Plasma Ketones	1	1	16	2	0	13	0	0	19	4	2	12	7	0	10
Toxicology Screening-Urinary	0	0	18	0	0	15	0	0	19	0	2	16	4	0	13
Serum osmolality	1	0	17	3	0	12	0	0	19	3	2	13	8	0	9
Urine osmolality	1	0	17	2	0	13	0	0	19	3	2	13	9	0	8
Pregnancy test	10	2	7	9	0	7	13	0	6	13	1	4	11	0	6
Thromboelastogram (TEG)	0	0	19	0	0	14	0	0	19	1	2	16	2	1	14
Peak Expiratory Flowmeter	0	0	19	0	1	14	0	0	19	6	1	11	10	0	7
Microscopy: Thin & Thick Smear	3	1	13	6	0	10	8	0	11	7	2	9	10	0	7
Rapid Diagnostic Test (Malaria)	6	0	12	5	1	10	8	0	11	7	2	9	10	0	7
CSF: Microscopy & Gram staining	4	1	12	3	1	11	2	1	16	6	2	10	9	0	8
Portable USG	4	1	12	3	1	11	0	1	18	15	1	4	14	0	4
Echocardiography	7	0	10	4	1	11	2	0	17	13	2	4	13	1	4
Portable X ray	11	1	7	7	1	7	3	4	12	17	1	2	13	2	3
CT Scan	10	0	7	7	0	8	3	0	14	8	3	8	10	0	7

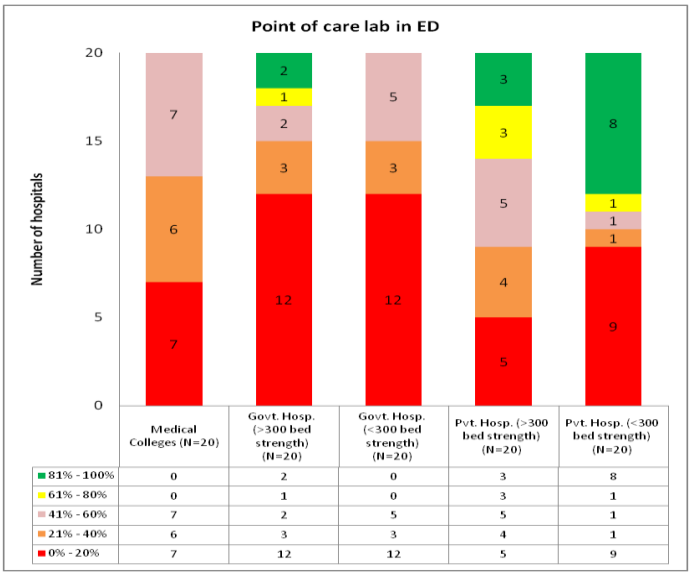
*n-number of hospitals, ED-Emergency Department, Hb- Hemoglobin , Hct- Hematocrit, TLC- Total Leukocyte Count, DLC- Differential Leukocyte Count, PT- Prothrombin Time, APTT- Activated partial thromboplastin time, INR- International Normalized Ratio, BNP- Brain Natriuretic Peptide, USG- Ultrasonography,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

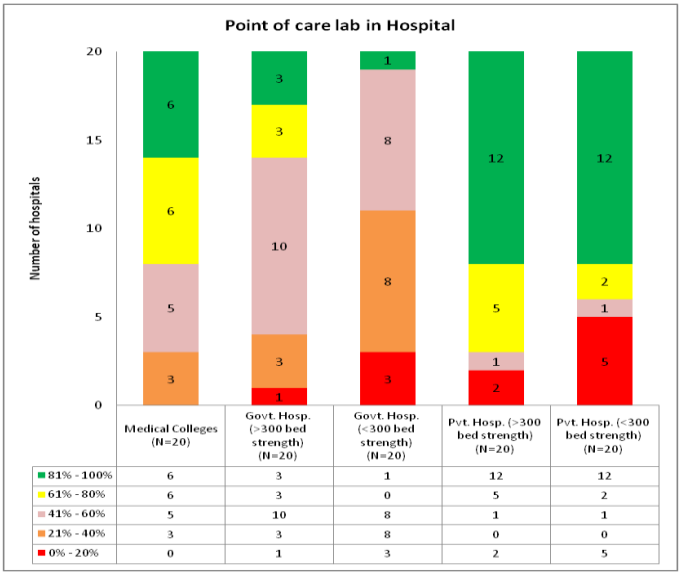
Table 44: Overall Summary of Hospital labs by Category of Hospitals

Hospital Labs	Medical Colleges (n=20)			Govt. Hospitals (>300 bed strength) (n=20)			Govt. Hospitals (<300 bed strength) (n=20)			Pvt. Hospitals (>300 bed strength) (n=20)			Pvt. Hospitals (<300 bed strength) (n=20)		
	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No	Yes	Partial	No
Hemogram- Hb, Hct, TLC, DLC, Platelet	19	0	1	19	0	0	19	0	0	16	0	1	15	0	0
Random blood Sugar	17	0	2	17	0	2	18	0	1	15	0	2	14	0	1
Coagulation profile: PT, APTT, INR	17	0	3	13	2	4	11	0	8	18	0	0	15	0	0
Electrolytes: Na, K, Cl,Ca	17	0	2	17	0	2	15	0	4	17	0	0	15	0	0
Blood Urea & Serum Creatinine	19	0	0	18	1	0	17	0	2	17	0	0	15	0	0
Blood Gas Analysis	12	1	6	10	1	8	1	1	17	16	0	1	14	0	1
Cardiac enzymes, Trop-I, Trop-T	11	4	4	9	4	6	6	0	13	17	0	1	14	0	1
Serum Amylase	16	1	2	12	1	5	6	1	12	17	0	1	15	0	0
D-Dimer	10	0	10	4	0	14	1	0	18	15	1	2	14	0	1
Pro-BNP	8	0	12	4	0	14	1	0	18	14	1	3	14	0	1
Urinary ketones	14	2	3	16	0	3	14	1	4	17	0	0	14	0	1
Plasma Ketones	10	1	9	6	1	11	2	0	17	13	0	5	11	0	4
Toxicology Screening-Urinary	7	1	12	2	0	16	1	0	18	11	1	6	6	1	9
Serum osmolality	8	1	11	5	0	13	1	0	18	15	0	3	14	0	1
Urine osmolality	8	2	10	8	0	10	1	1	17	15	0	3	15	0	0
Pregnancy test	18	0	1	17	0	2	18	0	1	17	0	1	14	0	1
Thromboelastogram (TEG)	3	0	16	1	0	16	1	0	18	9	0	8	4	0	11
Peak Expiratory Flowmeter	4	1	14	5	0	13	2	0	17	15	0	3	9	0	6
Microscopy: Thin & Thick Smear	18	1	1	18	1	0	16	2	1	18	0	0	15	0	0
Rapid Diagnostic Test (Malaria)	16	0	3	18	1	0	17	0	2	18	0	0	14	0	1
CSF: Microscopy & Gram staining	14	2	4	13	1	4	4	2	13	18	0	0	14	0	1
Portable USG	13	2	5	7	1	10	2	1	16	13	1	2	12	0	3
Echocardiography	18	1	1	9	1	9	2	1	16	16	1	0	14	0	1
Portable X ray	14	2	2	10	3	5	4	6	9	15	0	1	14	0	1
CT Scan	16	1	1	10	0	8	6	0	11	17	0	0	13	0	2

*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

Figure 50: Comparison of Point of Care Lab for ED & for Hospital on % basis of compliance





Suggestions:

All healthcare facilities should have either basic point of care lab in emergency department or emergency lab in hospital for 24*7

24. Essential Medicines for Emergency:

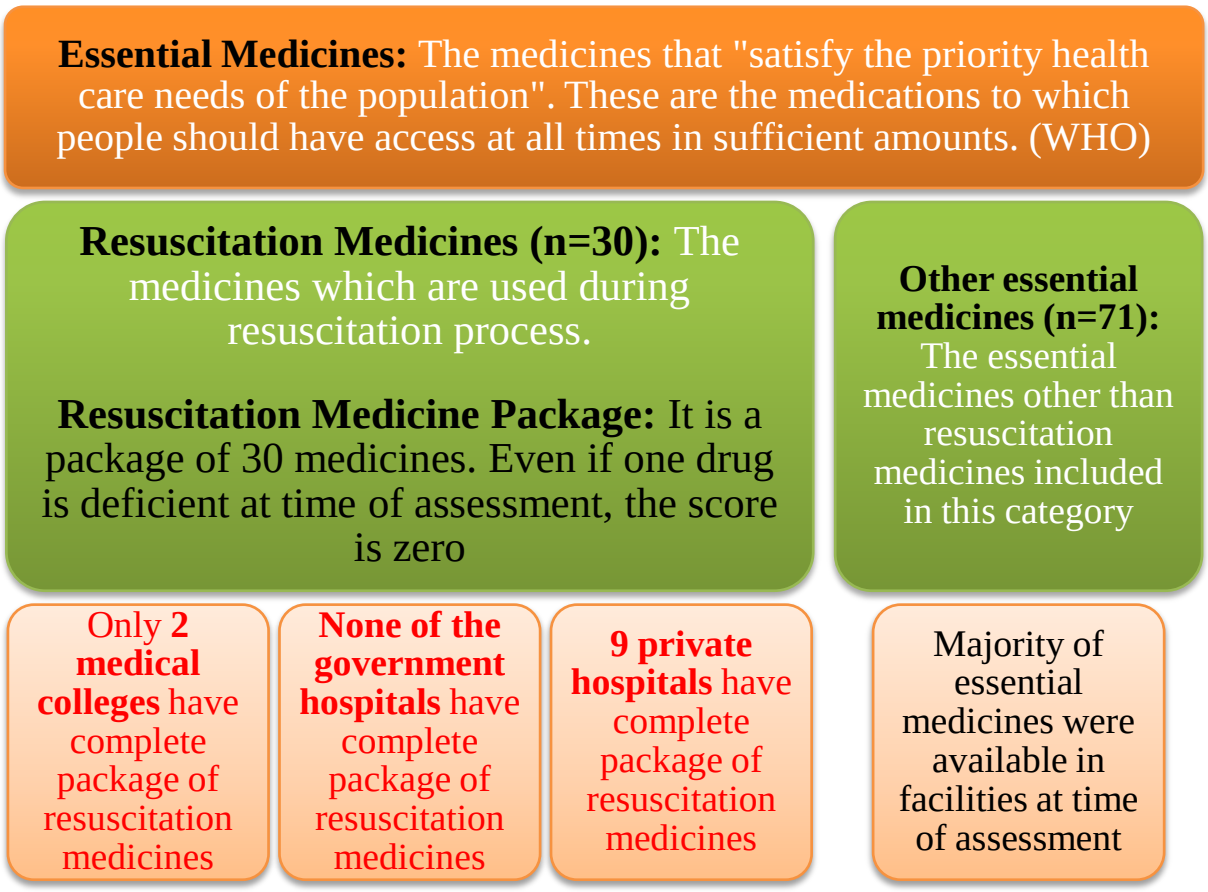
Out of 100 hospitals only 9 hospitals had all essential medicines required at emergency department. In addition, it was found that only 11 hospitals had essential medicines used in resuscitation out of all 100 hospitals.

Most of the 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 51: Chart of Essential medicines for Hospitals



Most of the hospitals did not have essential drugs used for emergency especially in government hospitals when compared to the private ones. Not all private hospitals had all the enlisted drugs for emergency as in annexure (figure 51).

Table 45: Overall Summary of Essential Medicines for Emergency:

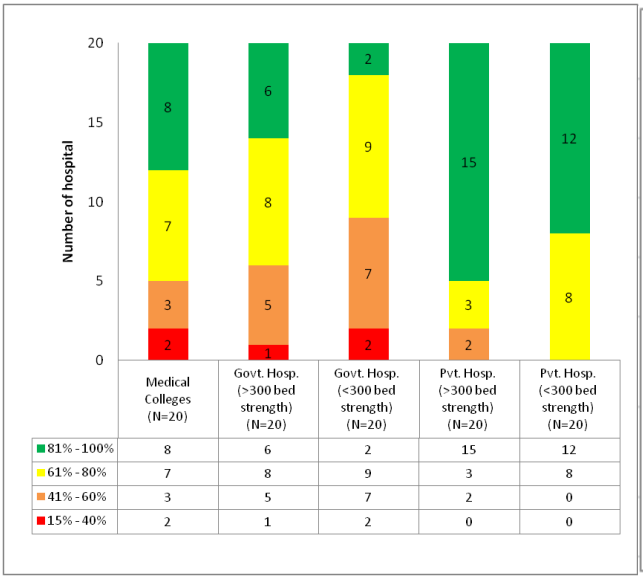
Essential Medicines/Drugs for Emergency	Medical Colleges (N=20)	Govt. Hosp. (>300 bed strength) (N=20)	Govt. Hosp. (<300 bed strength) (N=20)	Pvt. Hosp. (>300 bed strength) (N=20)	Pvt. Hosp. (<300 bed strength) (N=20)
Resuscitation Drugs	2 (10%)	0 (0%)	0 (0%)	3 (15%)	6 (30%)
Other Essential Drugs	72%	71%	63%	86%	87%

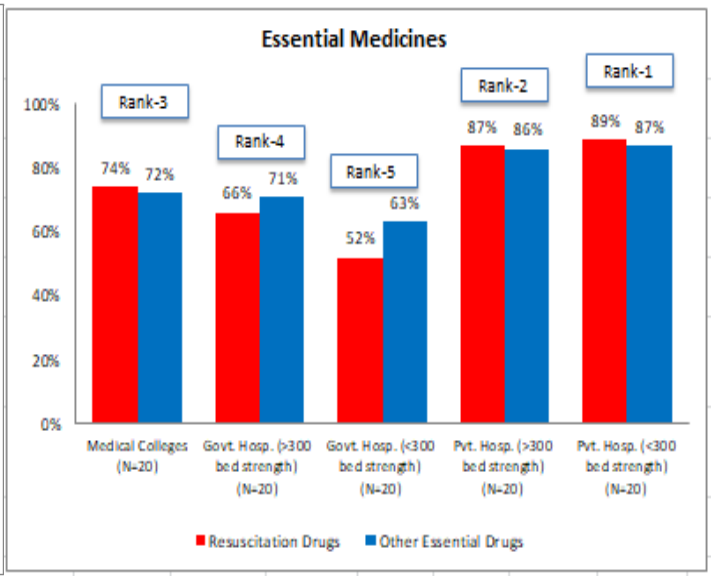
Only 2 medical colleges (Government Medical College, Thiruvananthapuram and AIIMS, Bhopal) had complete package of resuscitation drugs, other than these none of the government hospitals had complete package of resuscitation drugs out of 60 hospitals.

For private hospitals >300 beds, 3 hospitals (Grant Medical Foundation Ruby Hall Clinic, Pune; Kasturi Medical College & Hospital and Fortis Hospital, Jaipur) had complete package of resuscitation drugs.

For private hospitals >300 beds, 6 hospitals (Bhailal Amin General Hospital; Birla CK Hospital, Jaipur; Charak Hospital & Research Centre, Lucknow; Ruban Memorial Hospital; Ramakrishna Care Hospital and Primus Super Speciality Hospital) had complete package of resuscitation drugs.

Figure 52: Comparison of Essential Medicines for Emergency by Category of Hospitals i) on the basis of Percentage range ii) on the basis of Overall Performance/Compliance





Overall the small private hospitals performed best out of the 5 category of hospitals. Only 2 medical colleges have all essential medicines out of all 60 government hospitals.

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

Best Practices for Essential Medicines in ED:

100% compliance was observed in following hospitals for essential medicines which are required for emergency department:

- *Medical College: AIIMS, Bhopal, Government Medical College, Thiruvananthapuram*
- *Private Hospital: Grant Medical Foundation Ruby Hall Clinic, Kasturi Medical College & Hospital, Fortis Hospital, Jaipur, Birla CK Hospital, Ruban Memorial Hospital, Ramakrishna Care Hospital, and Primus Super Speciality Hospital*

LIVE OBSERVATION

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.

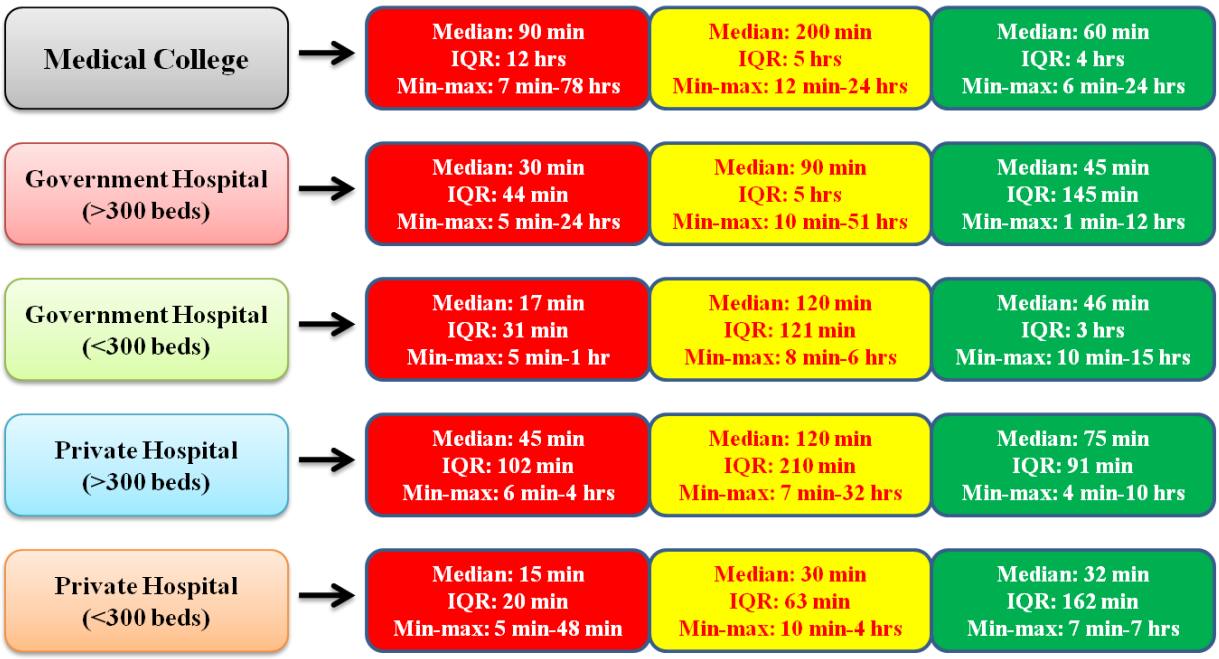
Ideal disposition time for red triage patients should be within 6 hours, for yellow triage patients should be within 12 hours.

Table 46: Summary of Disposition Time of Patients Visited in Emergency Department

Disposition time (in minutes)	Medical Colleges (n=20)	Govt. Hospitals (>300 bed strength) (n=20)	Govt. Hospitals (<300 bed strength) (n=20)	Pvt. Hospitals (>300 bed strength) (n=20)	Pvt. Hospitals (<300 bed strength) (n=20)
Red triaged patients	90 [686] 7-4680	30 [44] 5-1440	17 [31] 5-60	45 [102] 6-240	15 [20] 5-48
Yellow triaged patients	200 [307] 12-1440	90 [315] 10-3060	120 [121] 8-360	120 [210] 7-1920	30 [63] 10-225
Green triaged patients	60 [214] 6-1450	45 [145] 1-720	46 [188] 10-900	75 [91] 4-575	32 [162] 7-420

*n-number of hospitals, Median [IQR] Min-Max

Figure 53: Chart of Disposition time of Patients by Hospitals Category



The disposition time of red triaged patients was high in medical colleges with median of 90 minutes and low in private hospitals (<300 beds) with median of 15 minutes.

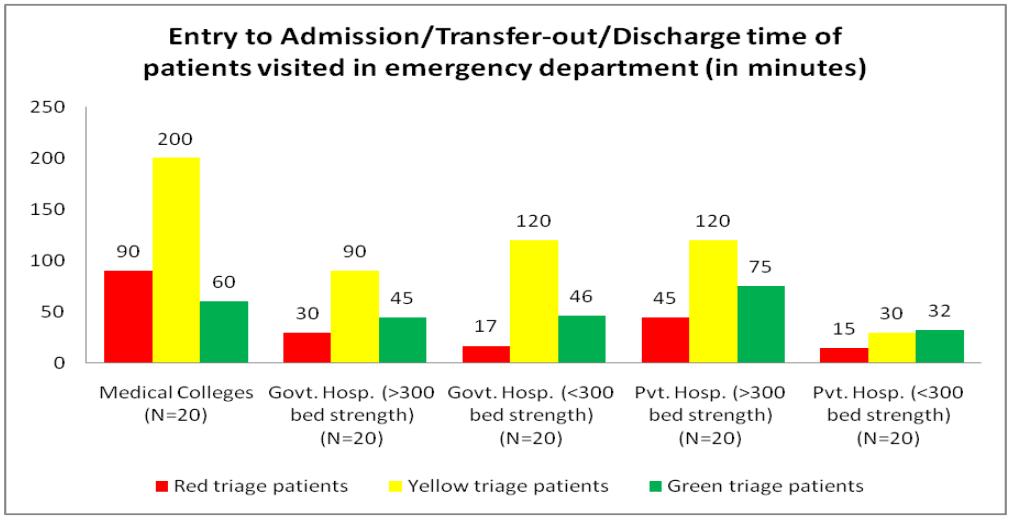
For yellow triaged patients the disposition time was high in medical college with median of 200 minutes and low in private hospitals (<300 beds) with median of 30 minutes.

Similarly, for green triaged patients it was high in private hospitals (>300 beds) with a median of 75 minutes and low in private hospitals (<300 beds) with median of 32 minutes.

The disposition time of red triaged patients was high in medical college. It was due to various factors observed as such:

1. Lack of emergency care provider
2. High patient load
3. Need of multi-speciality reviews
4. Multiple investigations being conducted
5. Lack of dedicated department leads todelayed decision making from definitive care/disposal
6. Not availability of buffer beds for addressing surge capacity under emergency department
7. Mismatch between available emergency beds and patient load and manpower
8. Not availability of triage policy in most of the hospitals

Figure 54: Comparison of Disposal Time of Patients visited in Emergency by Hospital Category



Suggestions:

1. Implementation of triage policy in all hospitals (Prioritization of patient)
2. Adequate manpower should be present in hospitals as per footfall of patients and emergency beds
3. Optimum utilization of resources

4. There should be a dedicated emergency nurse coordination (ENC) system
5. Empowered hospital committee comprising of members of emergency department and allied medical and surgical speciality to address the issues and challenges pertaining to emergency department

2. Chest Pain:

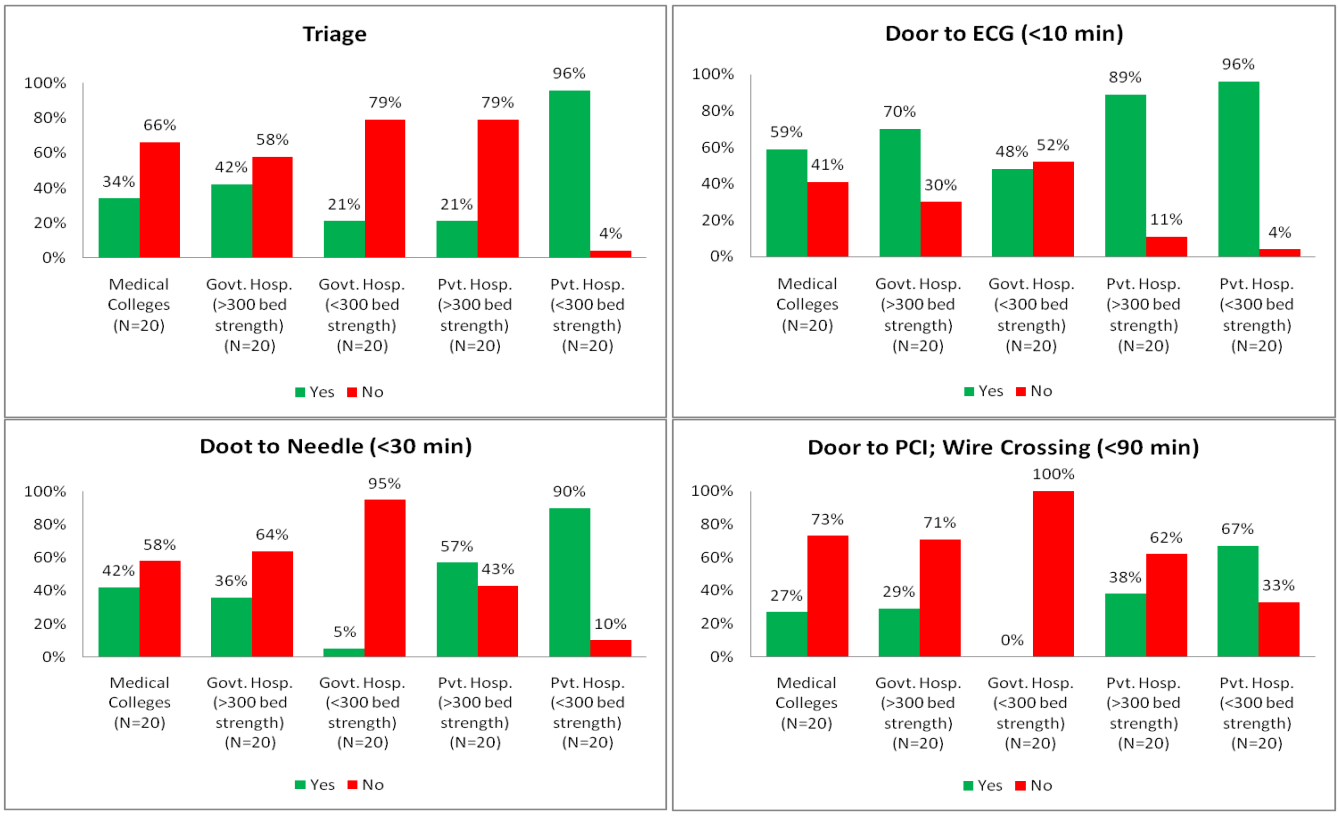
A) Hospital-wise comparison:

In this study, a total of 201 patients of chest pain were observed by our assessor's team from all zones and categories of our country.

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.

Firstly, 53% hospitals did not have triage. Secondly, ECG was not performed within 10 min in 30% hospitals. Some hospitals don't even have ECG machine. Thirdly, Door to needle was not performed 54% hospitals within 30 minutes. Lastly, Door to PCI was also absent in 68% hospitals.

Figure 55: Overall Comparison of Chest Pain Management by Category of Hospitals



*N=Number of red patients of chest pain, 65 patients were observed from 20 Medical Colleges, 33 patients were observed from 20 Govt. Hosp. (>300 bed strength), 34 patients were observed from 20 Govt. Hosp. (<300 bed strength), 44 patients were observed from 20 Pvt. Hosp. (>300 bed strength) and 25 patients were observed from 20 Pvt. Hosp. (<300 bed strength)

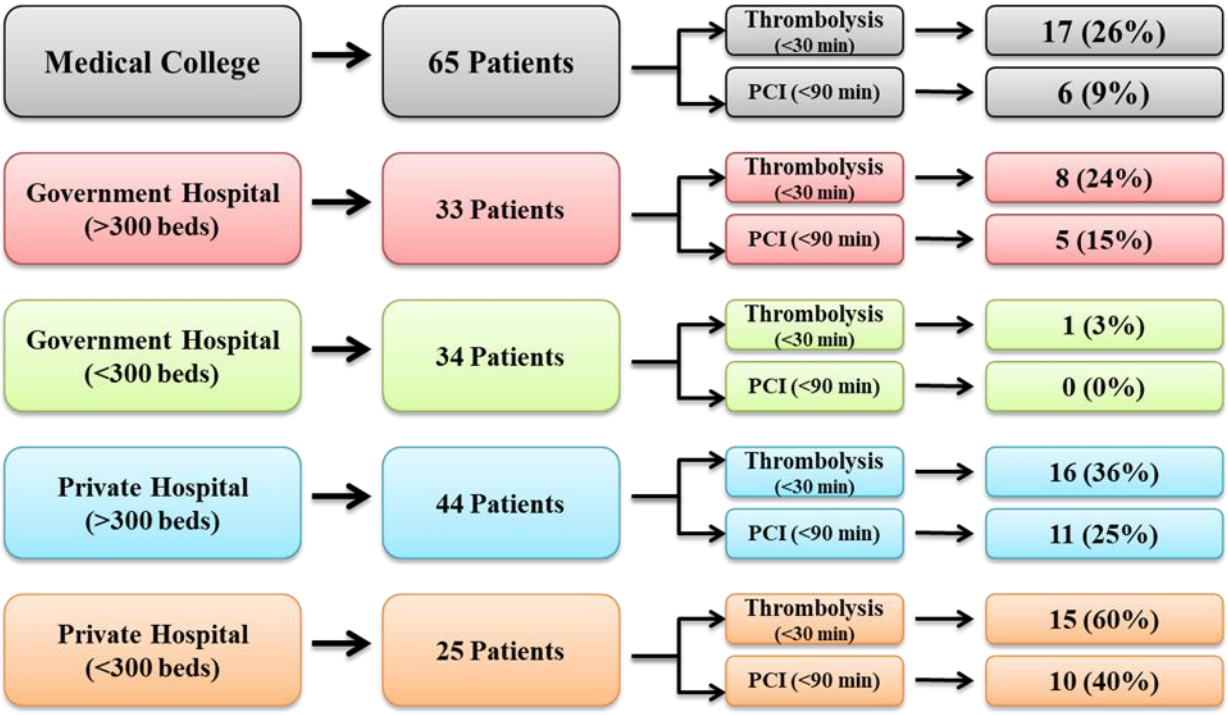
The management of chest pain was observed best in the private hospitals (<300 beds) among all the categories of healthcare facilities as shown in table 47 and figure 55. Overall door to PCI was not done in most of the hospitals.

Table 47: Summary of Chest Pain Management by Category of Hospitals: N (%)

Chest Pain Management	Medical Colleges (N=65 Pts)		Govt. Hosp. (>300 bed strength) (N=33 Pts)		Govt. Hosp. (<300 bed strength) (N=34 Pts)		Pvt. Hosp. (>300 bed strength) (N=44 Pts)		Pvt. Hosp. (<300 bed strength) (N=25 Pts)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Triage	22 (34)	43 (66)	14 (42)	19 (58)	7 (21)	27 (79)	28 (64)	16 (36)	24 (96)	1 (4)
Door to ECG (<10 min)	37 (59)	26 (41)	23 (70)	10 (30)	16 (48)	17 (52)	39 (89)	5 (11)	24 (96)	1 (4)
Door to Needle (<30 min)	17 (42)	23 (58)	8 (36)	14 (64)	1 (5)	20 (95)	16 (57)	12 (43)	18 (90)	2 (10)
Door to PCI (<90 min)	6 (27)	16 (73)	5 (29)	12 (71)	0 (0)	16 (100)	11 (38)	18 (62)	10 (67)	5 (33)

*N=Number of red patients of chest pain, 65 patients were observed from 20 Medical Colleges, 33 patients were observed from 20 Govt. Hosp. (>300 bed strength), 34 patients were observed from 20 Govt. Hosp. (<300 bed strength), 44 patients were observed from 20 Pvt. Hosp. (>300 bed strength) and 25 patients were observed from 20 Pvt. Hosp. (<300 bed strength)

Figure 56: Chart of Chest Pain Management of patients by Category of Hospitals



B) Zone-wise comparison:

In addition, it was observed that the east zone performed best and the north zone performed worst out of all zones.

In the east zone, 35 patients of chest pain had observed in 11 different hospitals and 17 patients managed within the timeframe.

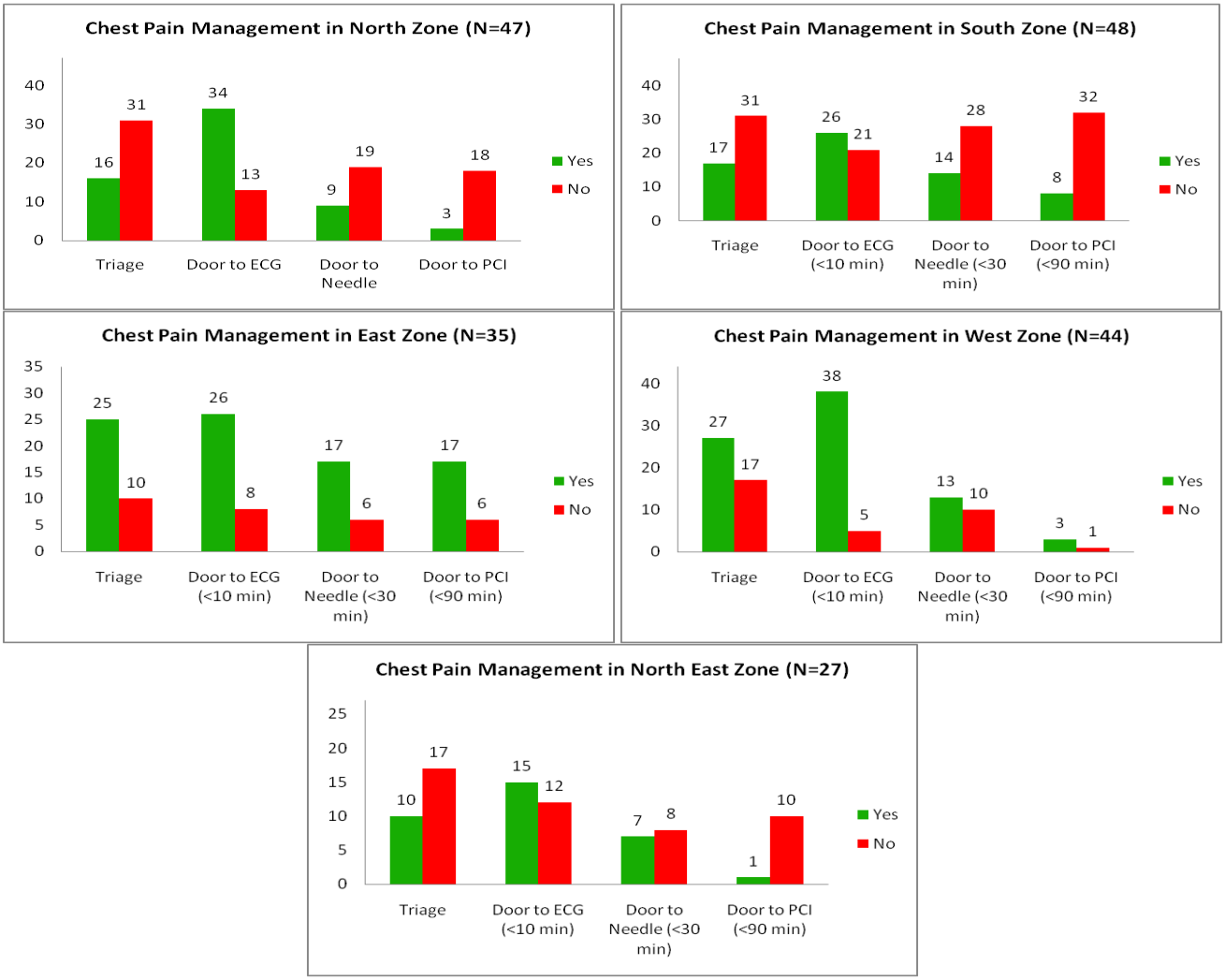
Similarly, 47 patients of chest pain had observed in 11 different hospitals of north zone and only 3 patients managed within the timeframe.

Table 48: Zone-wise Summary of Chest Pain Management in Hospitals: N (%)

Chest Pain Management	North (N=47 Pts.)		South (N=48 Pts.)		East (N=35 Pts.)		West (N=44 Pts.)		North East (N=27 Pts.)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Triage	16 (34)	31 (66)	17 (35)	31 (65)	25 (71)	10 (29)	27 (61)	17 (39)	10 (37)	17 (63)
Door to ECG (<10 min)	34 (72)	13 (28)	26 (55)	21(45)	26 (76)	8 (24)	38 (88)	5 (12)	15 (56)	12 (44)
Door to Needle (<30 min)	9 (32)	19 (68)	14 (33)	28 (67)	17 (74)	6 (26)	13 (57)	10 (43)	7 (47)	8 (53)
Door to PCI (<90 min)	3 (14)	18 (86)	8 (20)	32 (80)	17 (74)	6 (26)	3 (75)	1 (25)	1 (9)	10 (91)

*N=Number of red patients of chest pain, 47 patients were observed from 30 hospitals of north zone, 48 patients were observed from 21 hospitals of south zone, 35 patients were observed from 11 hospitals of east zone, 44 patients were observed from 16 hospitals of west zone and 27 patients were observed from 22 hospitals of north-east zone

Figure 57: Zone-wise Comparison of Chest Pain Management in Hospitals



*N=Number of red patients of chest pain, 47 patients were observed from 30 hospitals of north zone, 48 patients were observed from 21 hospitals of south zone, 35 patients were observed from 11 hospitals of east zone, 44 patients were observed from 16 hospitals of west zone and 27 patients were observed from 22 hospitals of north-east zone

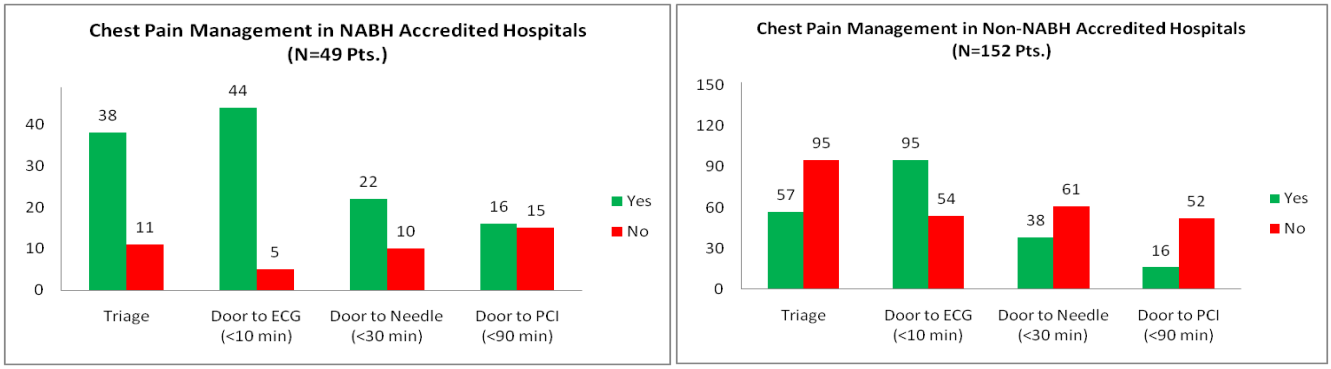
C) NABH Accreditation-wise comparison:

Also, it was observed that NABH accredited hospitals performed better than non-NABH accredited hospitals for management of chest pain (table 49 and figure 58).

Table 49: Overall Summary of Chest Pain Management in NABH accredited and non-NABH accredited hospitals: N (%)

Chest Pain Management	NABH Accredited Hospitals (Pt.= 49)		Non-NABH Accredited Hospitals (Pt.= 152)	
	Yes	No	Yes	No
Triage	38 (78)	11 (22)	57 (37)	95 (63)
Door to ECG (<10 min)	44 (90)	5 (10)	95 (64)	54 (36)
Door to Needle (<30 min)	22 (69)	10 (31)	38 (38)	61 (62)
Door to PCI (<90 min)	16 (52)	15 (48)	16 (24)	52 (76)

Figure 58: Overall Comparison of Chest Pain Management in NABH accredited and non-NABH accredited hospitals



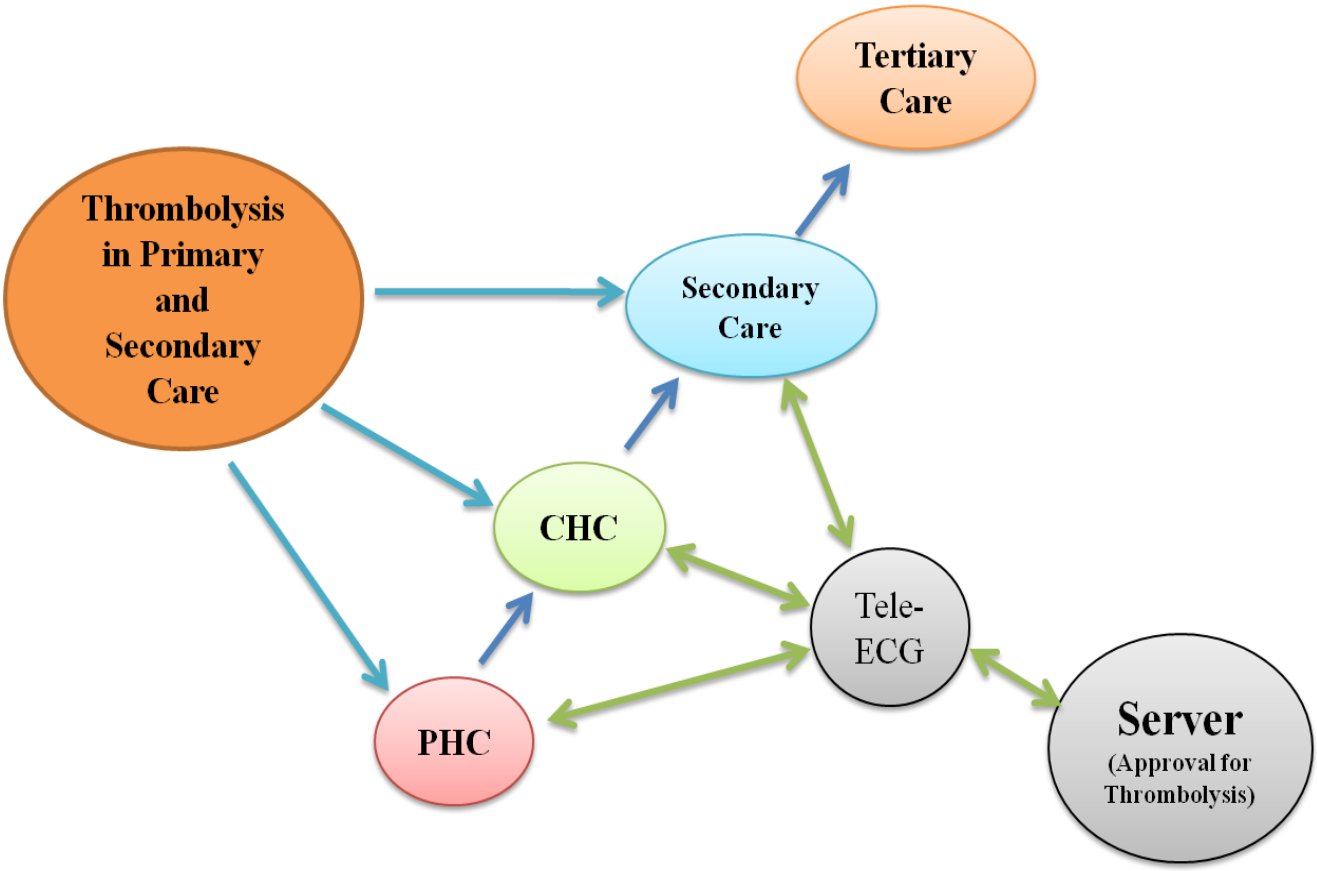
Factors affecting Chest Pain Management:

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 for Management of Chest pain:

1. Upgrade them for thrombolysis.
2. Adequately trained emergency care provider.
3. All district hospitals must have ECG machine and technician.
4. Establish 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 59)
7. Develop PCI centres in multi-speciality hospitals

Figure 59: 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.

A) Hospital-wise comparison:

The management of stroke was observed best in the small private hospitals and worst observed in small government hospitals among all the categories of healthcare facilities due to lack of facilities as shown in table 50 and figure 60.

Figure 60: Comparison of Stroke Management by Category of Hospitals

*N=Number of red patients of stroke, 50 patients were observed from 20 Medical Colleges, 17 patients were observed from 20 Govt. Hosp. (>300 bed strength), 14 patients were observed from 20 Govt. Hosp. (<300 bed strength), 25 patients were observed from 20 Pvt. Hosp. (>300 bed strength) and 20 patients were observed from 20 Pvt. Hosp. (<300 bed strength)

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

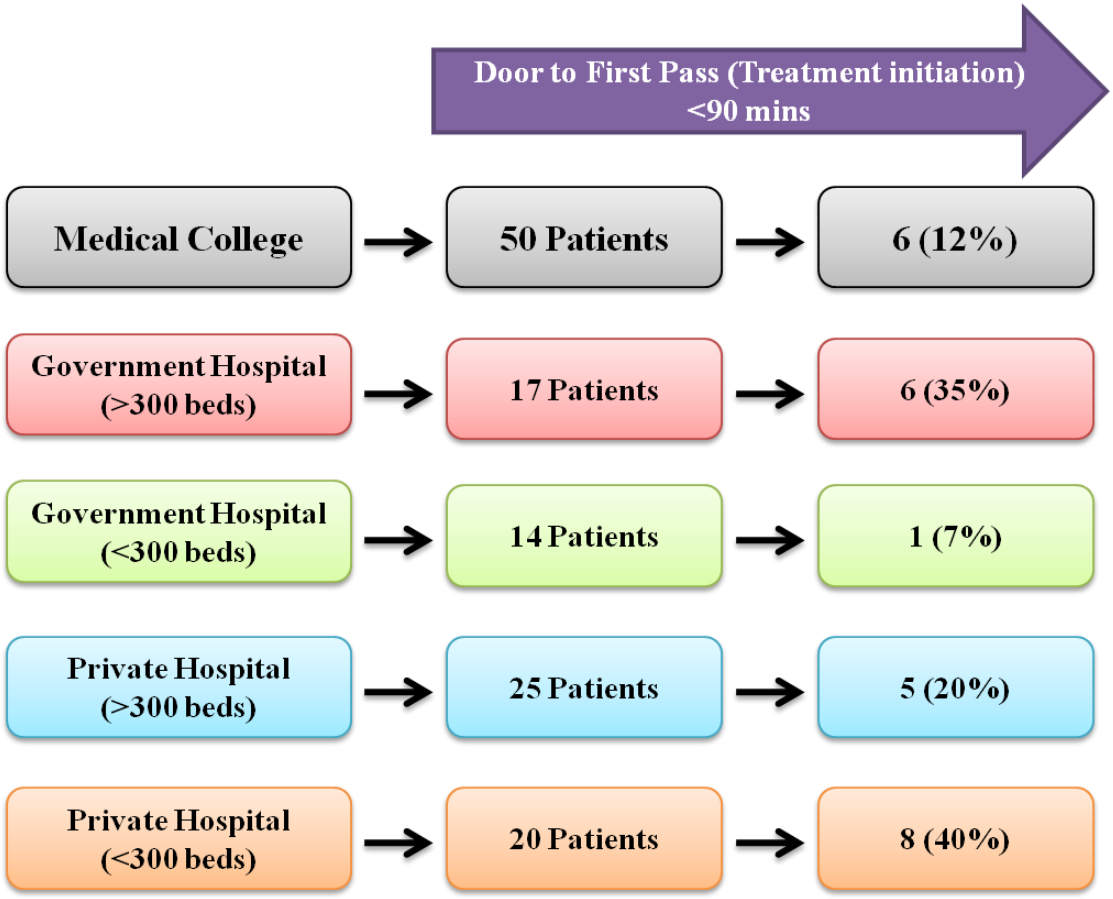
Door to Doctor was achieved within 10 minutes in 79% hospitals. But Door to CT completion was not performed within 25 minutes in 47% hospitals. Door to CT reading was not achieved within 45 minutes in 52% hospitals. Door to thrombolysis was absent in 74% hospitals as shown in figure 61.

Table 50: Summary of Stroke Management by Category of Hospitals: N (%)

Stroke Management	Medical Colleges (N=50 Pts)		Govt. hospitals (>300 bed strength) (N=17 Pts)		Govt. hospitals (<300 bed strength) (N=14 Pts)		Pvt. hospitals (>300 bed strength) (N=25 Pts)		Pvt. hospitals (<300 bed strength) (N=20 Pts)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Door to Doctor (<10 min)	38 (76)	12 (24)	15 (88)	2 (12)	9 (64)	5 (36)	20 (80)	5 (20)	18 (90)	2 (10)
Door to CT Completion (<25 min)	16 (34)	31 (66)	10 (63)	6 (37)	1 (8)	12 (92)	19 (76)	6 (24)	17 (89)	2 (11)
Door to CT reading(<45 min)	15 (31)	33 (69)	10 (63)	6 (37)	1 (8)	12 (92)	15 (60)	10 (40)	17 (94)	1 (6)
Door to Thrombolytic (<60 min)	6 (16)	32 (84)	6 (40)	9 (60)	0 (0)	9 (100)	7 (33)	14 (67)	6 (50)	6 (50)
Door to First Pass (<90 min)	6 (23)	20 (77)	6 (50)	6 (50)	1 (10)	9 (90)	5 (31)	11 (69)	8 (73)	3 (27)

*N=Number of red patients of stroke, 50 patients were observed from 20 Medical Colleges, 17 patients were observed from 20 Govt. Hosp. (>300 bed strength), 14 patients were observed from 20 Govt. Hosp. (<300 bed strength), 25 patients were observed from 20 Pvt. Hosp. (>300 bed strength) and 20 patients were observed from 20 Pvt. Hosp. (<300 bed strength)

Figure 61: Chart of Stroke Management of patients by Hospital Category



B) Zone-wise comparison:

In addition, it was observed that the east zone performed best and the north zone performed worst out of all zones (table 51 and figure 62).

Table 51: Zone-wise Summary of Stroke Management in Hospitals: N (%)

Stroke Management	North (N=19 Pts.)		South (N=43 Pts.)		East (N=24 Pts.)		West (N=16 Pts.)		North East (N=24 Pts.)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Door to Doctor (<10 min)	18 (95)	1 (5)	33 (77)	10 (23)	18 (75)	6 (25)	11 (69)	5 (31)	20 (83)	4 (17
Door to CT Completion (<25 min)	9 (47)	10 (53)	22 (51)	21 (49)	17 (71)	7 (29)	6 (46)	7 (54)	9 (42)	12 (57)
Door to CT reading (<45 min)	6 (33)	12 (67)	23 (53)	20 (47)	18 (75)	6 (25)	6 (46)	7 (54)	5 (23)	17 (77)
Door to Thrombolytic (<60 min)	3 (27)	8 (73)	6 (15)	34 (85	16 (73)	6 (27)	0 (0)	6 (100)	0 (0)	16 (100)
Door to First Pass (<90 min)	3 (30)	7 (70)	7 (22)	25 (78)	15 (71)	6 (29)	0 (0)	4 (100)	1 (13)	7 (87)

*N=Number of red patients of stroke, 19 patients were observed from 30 hospitals of north zone, 43 patients were observed from 21 hospitals of south zone, 24 patients were observed from 11 hospitals of east zone, 16 patients were observed from 16 hospitals of west zone and 24 patients were observed from 22 hospitals of north-east zone

Figure 62: Zone-wise Comparison of Stroke Management in Hospitals

*N=Number of red patients of stroke, 19 patients were observed from 30 hospitals of north zone, 43 patients were observed from 21 hospitals of south zone, 24 patients were observed from 11 hospitals of east zone, 16 patients were observed from 16 hospitals of west zone and 24 patients were observed from 22 hospitals of north-east zone

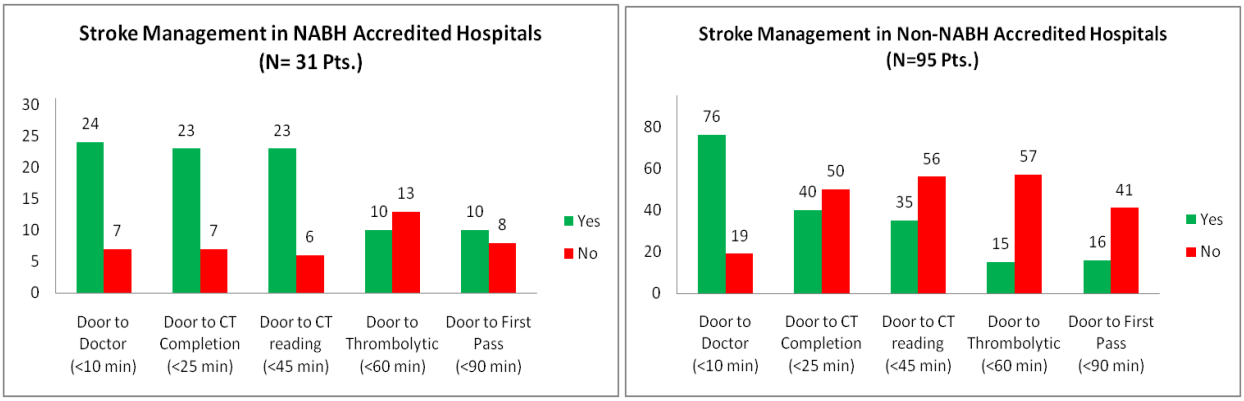
C) NABH Accreditation-wise comparison:

Also, it was observed that NABH accredited hospitals performed better than non-NABH accredited hospitals for management of stroke (table 52 and figure 63).

Table 52: Overall Summary of Stroke Management in NABH accredited and non-NABH accredited hospitals: N (%)

Stroke Management	NABH Accredited Hospitals (N=28) (Pts.= 31)				Non-NABH Accredited Hospitals (N=72) (Pts.= 95)			
	Yes		No		Yes		No	
Door to Doctor (<10 min)	24	77%	7	23%	76	80%	19	20%
Door to CT Completion (<25 min)	23	77%	7	23%	40	44%	50	56%
Door to CT reading (<45 min)	23	79%	6	31%	35	38%	56	62%
Door to Thrombolytic (<60 min)	10	43%	13	57%	15	21%	57	79%
Door to First Pass (<90 min)	10	56%	8	44%	16	28%	41	72%

Figure 63: Overall Summary of Stroke Management in NABH accredited and non-NABH accredited 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

Best Practice for CT Scan in District Hospitals:

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

Suggestions:

1. Thrombolysis near home – Hub and Spoke Model (figure 59)
2. Develop Tele-stroke programme
3. Stroke management by PPP (Public-Private Partnership) model in district hospitals

4. Trauma:

A) Hospital-wise comparison:

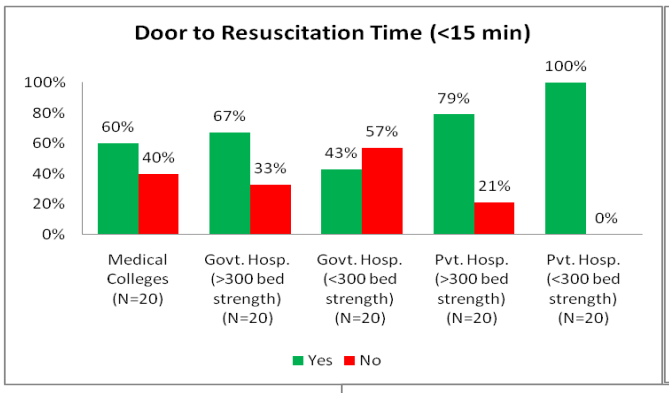
It was observed that trauma management was good in private hospitals when compared to the government ones as shown in table 53and figure64, because the disposal of patients was delayed in government hospitals.

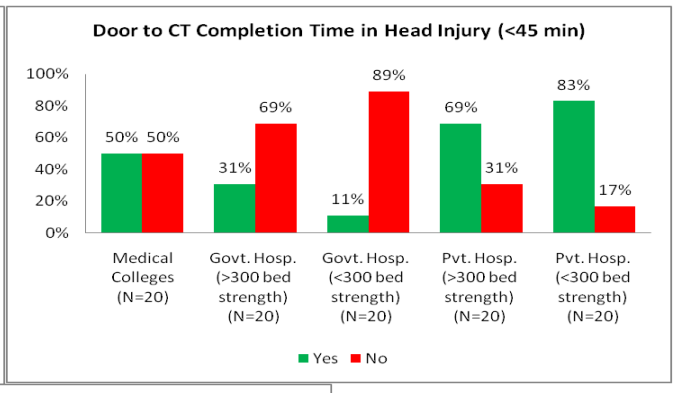
Table 53: Summary of Trauma Management by Category of Hospitals: N (%)

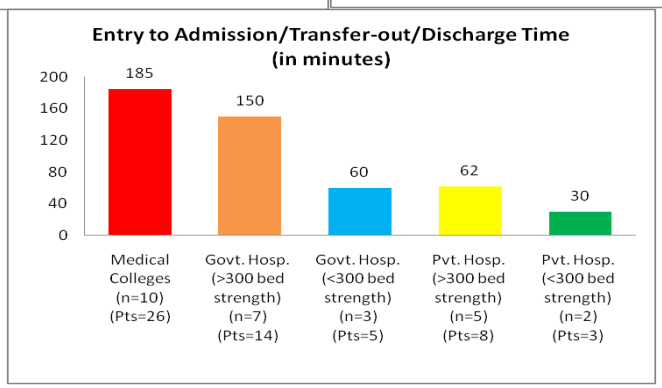
Trauma Management	Medical Colleges (N=57 Pts)		Govt. hospitals (>300 bed strength) (N=30 Pts)		Govt. hospitals (<300 bed strength) (N=21 Pts)		Pvt. hospitals (>300 bed strength) (N=24 Pts)		Pvt. hospitals (<300 bed strength) (N=12 Pts)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Door to Resuscitation time (<15 min)	34 (60)	23 (40)	20 (67)	10 (33)	9 (43)	12 (57)	19 (73)	5 (21)	12 (100)	0 (0)
Door to CT Completion time in Head Injury (<45 min)	26 (50)	26 (50)	9 (31)	20 (69)	2 (11)	16 (89)	11 (69)	5 (31)	10 (83)	2 (17)
Disposal Time (in minutes)	185		150		60		62		30	

*N=Number of red patients of trauma, 57 patients were observed from 20 Medical Colleges, 30 patients were observed from 20 Govt. Hosp. (>300 bed strength), 21 patients were observed from 20 Govt. Hosp. (<300 bed strength), 24 patients were observed from 20 Pvt. Hosp. (>300 bed strength) and 12 patients were observed from 20 Pvt. Hosp. (<300 bed strength)

Figure64: Comparison of Trauma Management by Hospital Categories







*N=Number of red patients of trauma, 57 patients were observed from 20 Medical Colleges, 30 patients were observed from 20 Govt. Hosp. (>300 bed strength), 21 patients were observed from 20 Govt. Hosp. (<300 bed strength), 24 patients were observed from 20 Pvt. Hosp. (>300 bed strength) and 12 patients were observed from 20 Pvt. Hosp. (<300 bed strength)

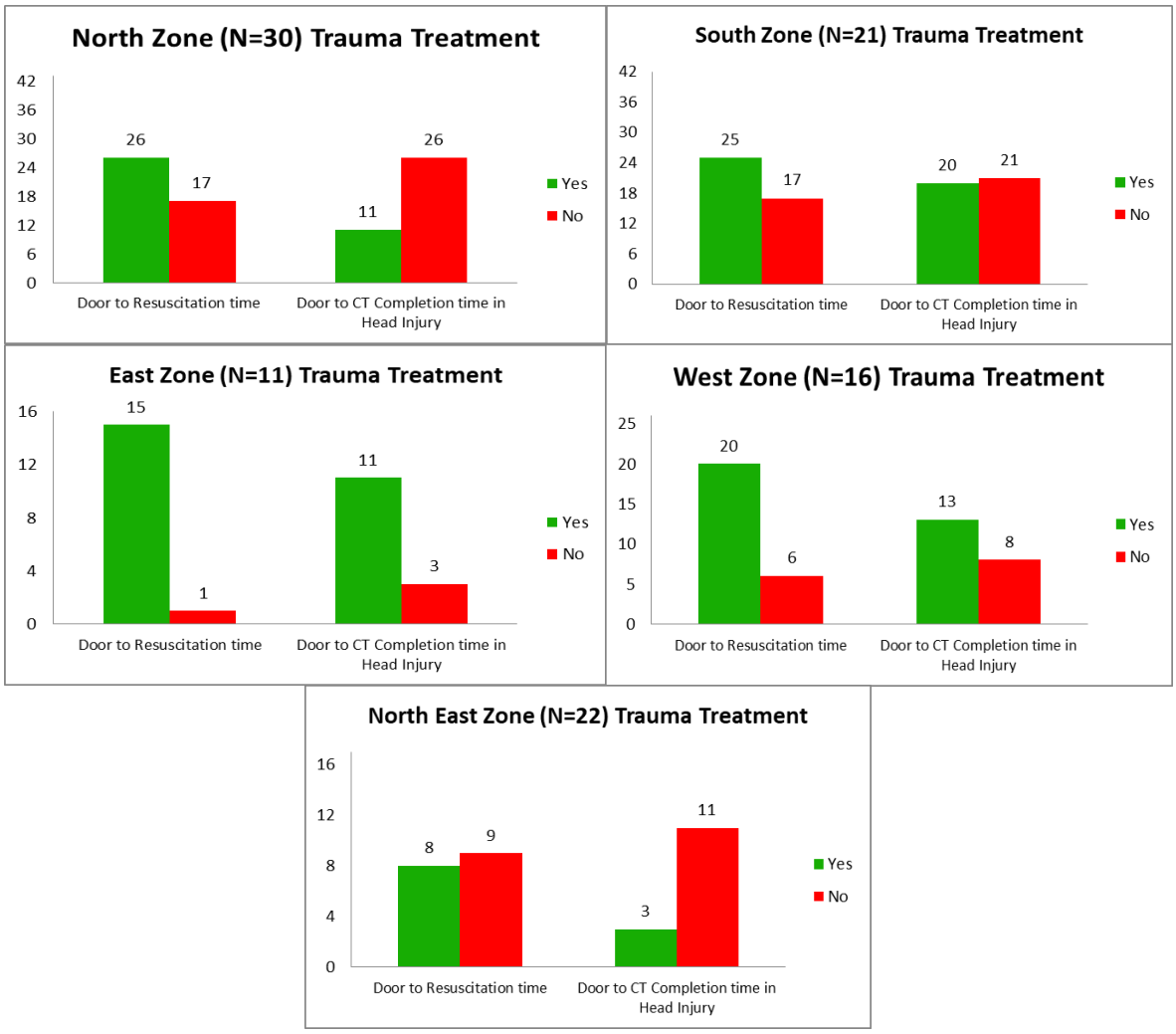
B) Zone-wise comparison:

Table 54: Zone-wise Summary of Trauma Management in Hospitals: N (%)

Trauma Management	North (N=43 Pts.)		South (N=42 Pts.)		East (N=16 Pts.)		West (N=26 Pts.)		North East (N=17 Pts.)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Door to Resuscitation time (<15 min)	26 (60)	17 (40)	25 (60)	17 (40)	15 (94)	1 (6)	20 (77)	6 (23)	8 (47)	9 (53)
Door to CT Completion time in Head Injury (<45 min)	11 (30)	26 (70)	20 (49)	21 (51)	11 (79)	3 (21)	13 (62)	8 (38)	3 (21)	11 (79)
Disposal Time (in minutes)	498		635		-		103		110	

*N=Number of red patients of trauma, 43 patients were observed from 30 hospitals of north zone, 42 patients were observed from 21 hospitals of south zone, 16 patients were observed from 11 hospitals of east zone, 26 patients were observed from 16 hospitals of west zone and 17 patients were observed from 22 hospitals of north-east zone.

Figure 65: Zone-wise Comparison of Trauma Management in Hospitals



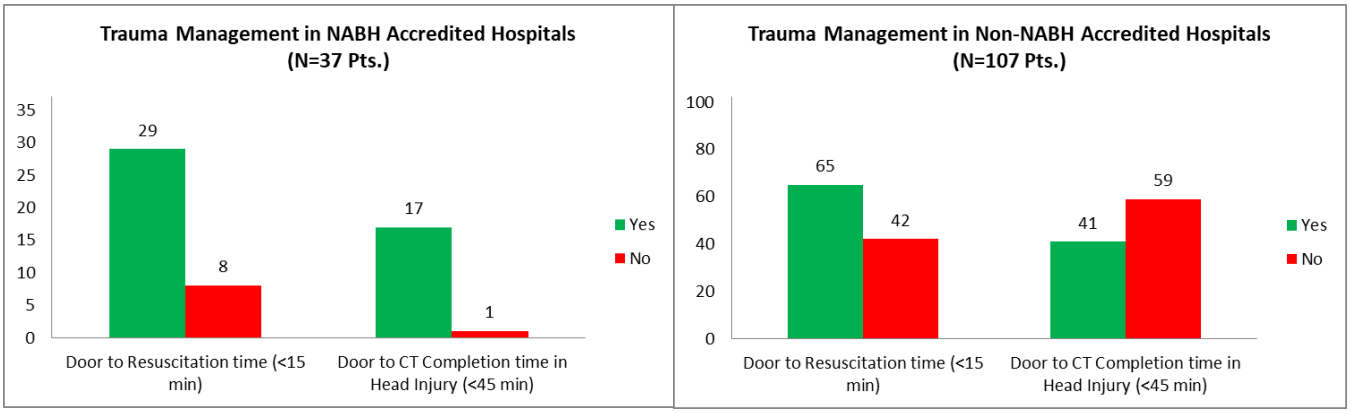
*N=Number of red patients of trauma, 43 patients were observed from 30 hospitals of north zone, 42 patients were observed from 21 hospitals of south zone, 16 patients were observed from 11 hospitals of east zone, 26 patients were observed from 16 hospitals of west zone and 17 patients were observed from 22 hospitals of north-east zone.

C) NABH Accreditation comparison:

Table 55: Summary of Trauma Management in NABH accredited and non-NABH accredited hospitals

Trauma Management	NABH Accredited Hospitals (N=28) (Pt.= 37)				Non-NABH Accredited Hospitals (N=72) (Pt.= 107)			
	Yes		No		Yes		No	
Door to Resuscitation time(<15 min)	29	78%	8	22%	65	61%	42	39%
Door to CT Completion time in Head Injury(<45 min)	17	63%	1	37%	41	41%	59	59%
Disposal Time (in minutes)	74				395			

Figure 66: Comparison of Trauma Management in NABH accredited and non-NABH accredited 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

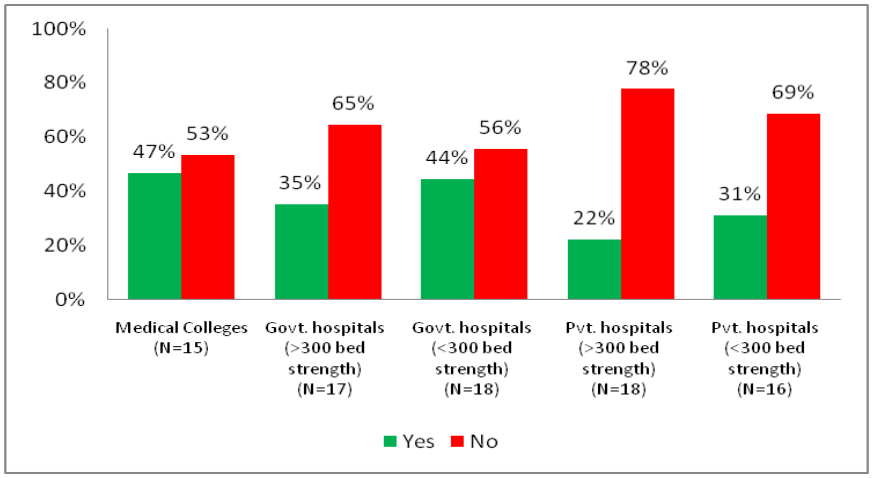
5. Incidence of Violence:

During assessment, incidence of violence was observed in the hospital and assessors noted the observation in the given study tool. In the given table 56 and figure 67 the ratio of incidence of violence is shown by category of hospitals.

Table 56: Summary of incidence of Violence by Hospital Categories: N (%)

Live Observation	Medical Colleges (n=15)		Govt. hospitals (>300 bed strength) (n=17)		Govt. hospitals (<300 bed strength) (n=18)		Pvt. hospitals (>300 bed strength) (n=18)		Pvt. hospitals (<300 bed strength) (n=16)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Incidence of Violence	7 (47)	8 (53)	6 (35)	11 (65)	8 (44)	10 (56)	4 (22)	14 (78)	5 (31)	11 (69)

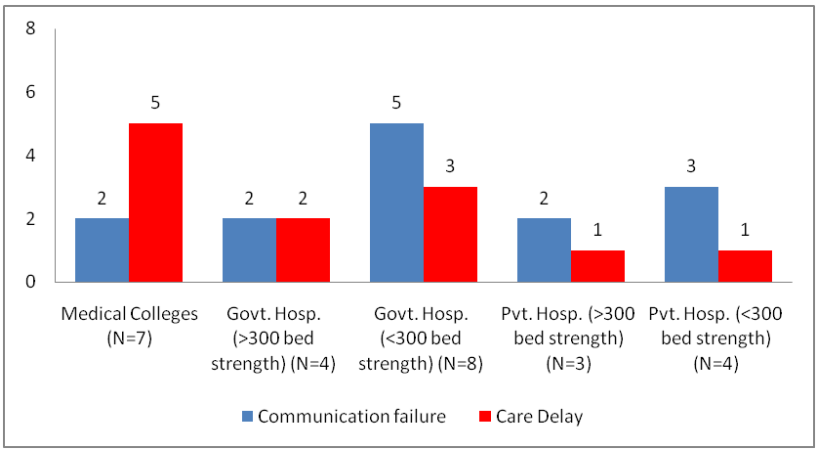
Figure 67: Representation of Incidence of Violence Observed by Category of Hospitals



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 found either communication failure or care delay.

Figure 68: Representation of the reason of Violence by Category of Hospitals



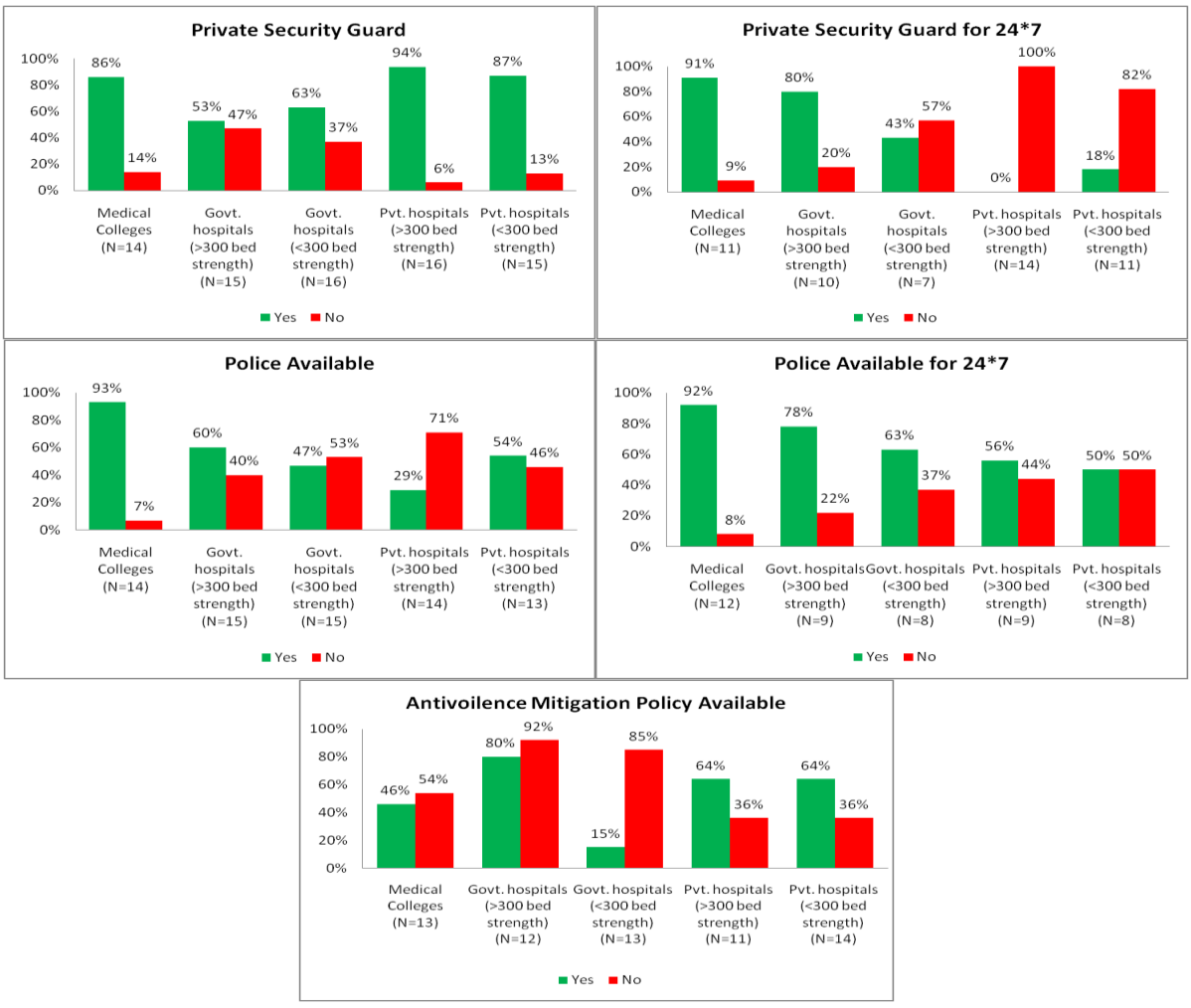
5.2 Mitigation measures:

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

Table 57: Summary of Mitigation measures available by Category of Hospitals: N (%)

Mitigation measures	Medical Colleges (N=20)		Govt. hospitals (>300 bed strength) (N=20)		Govt. hospitals (<300 bed strength) (N=20)		Pvt. hospitals (>300 bed strength) (N=20)		Pvt. hospitals (<300 bed strength) (N=20)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Private security guard	12 (86)	2 (14)	8 (53)	7 (47)	10 (63)	6 (37)	15 (94)	1 (6)	13 (87)	2 (13)
Private Security Guard 24*7	10 (91)	1 (9)	8 (80)	2 (20)	4 (43)	3 (57)	14 (0)	2 (100)	9 (18)	2 (82)
Police Available	13 (93)	1 (7)	9 (60)	6 (40)	7 (47)	8 (53)	4 (29)	10 (71)	7 (54)	6 (46)
Police Available Guard 24*7	11 (32)	1 (8)	7 (78)	2 (22)	5 (63)	3 (37)	5 (56)	4 (44)	4 (50)	4 (50)
Anti-violence mitigation policy available	6 (46)	7 (54)	1 (8)	11 (92)	2 (15)	11 (85)	7 (64)	4 (36)	9 (64)	5 (36)

Figure 69: Representation of Mitigation measures available by Category of 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 to inform them about the condition of patient. It was observed that sometimes the health care provider/staff/nurses did not communicate properly with the patient/patient attendant/relative.

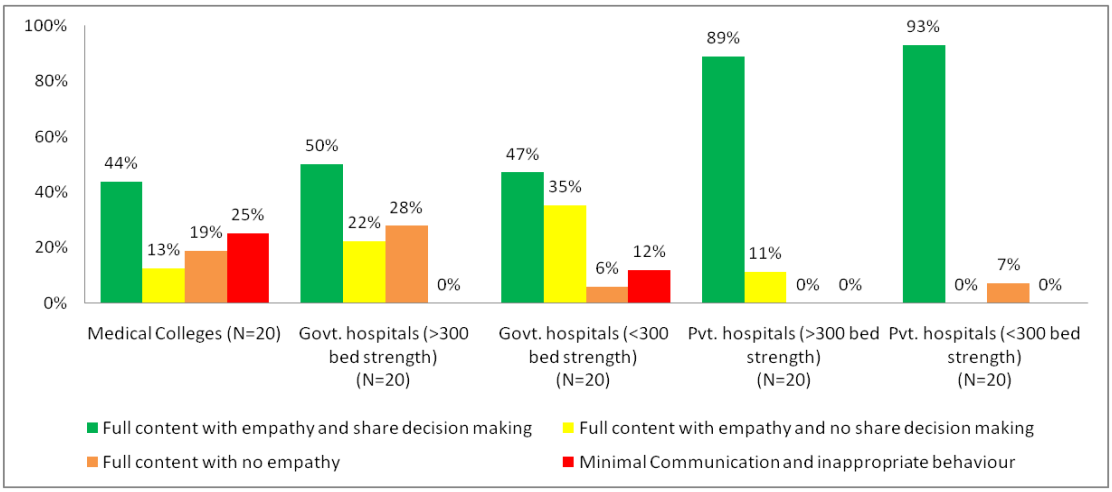
For knowing the way of communication, assessor's team observed the communication between hospital staff and patient during live observation and the summary of communication skills is shown in table 58 and figure 70.

Table 58: Summary of Communication Skills in Emergency Department by Category of Hospitals: N (%)

Communication Skills in ED	Medical Colleges (n=20)	Govt. hospitals (>300 bed strength) (n=20)	Govt. hospitals (<300 bed strength) (n=20)	Pvt. hospitals (>300 bed strength) (n=20)	Pvt. hospitals (<300 bed strength) (n=20)
Full content with empathy and share decision making	7 (44)	9 (50)	8 (47)	16 (89)	13 (93)
Full content with empathy and no share decision making	2 (13)	4 (22)	6 (35)	2 (11)	0 (0)
Full content with no empathy	3 (19)	5 (28)	1 (6)	0 (0)	1 (7)
Minimal Communication and inappropriate behaviour	4 (25)	0 (0)	2 (12)	0 (0)	0 (0)

*n- number of hospitals

Figure 70: Representation of Communication Skills in Emergency Department of Hospital Category



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:

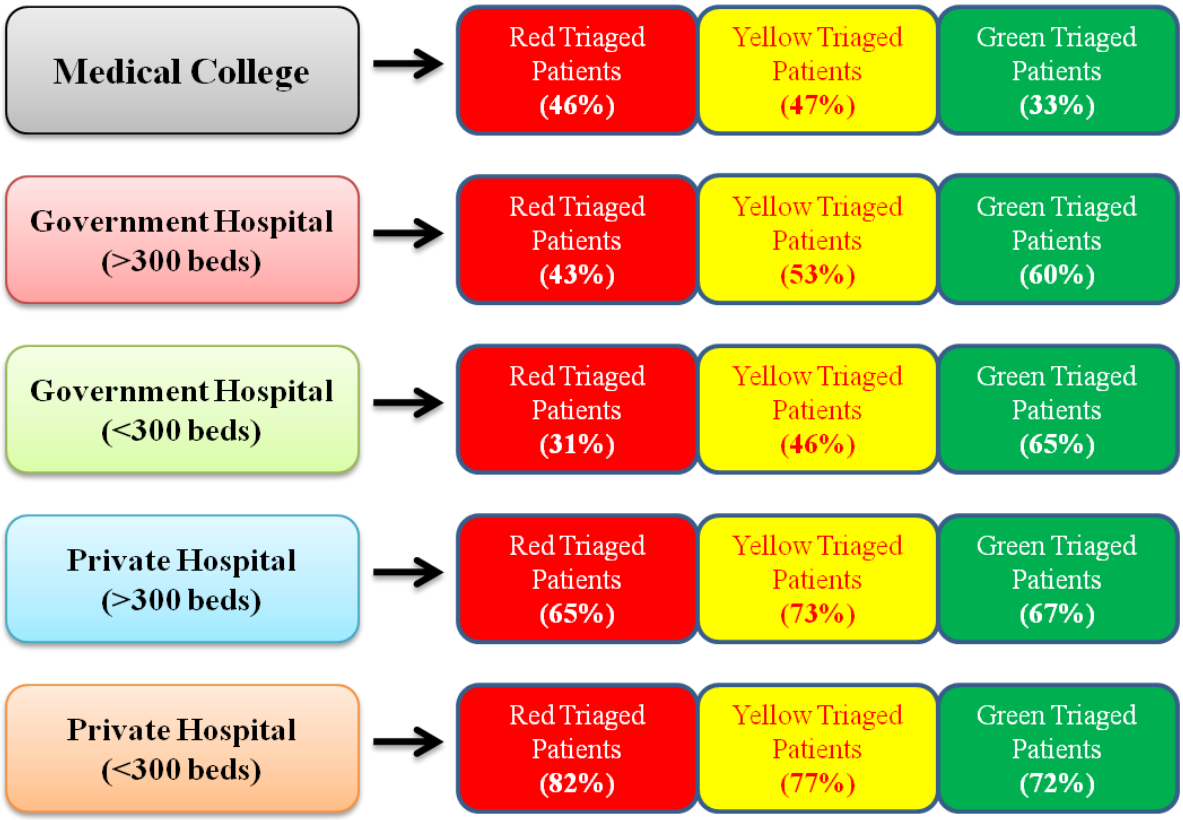
During live observation by assessor's team for 24 hours, 3-5 random patients from each triage category (red, yellow and green) were asked few questions about the care (in terms of satisfaction) provided in the hospital.

Table 59: Summary of Patient Satisfaction by Category of Hospitals

Patient Satisfaction	Medical Colleges (n=20)			Govt. hospitals (>300 bed strength) (n=20)			Govt. hospitals (<300 bed strength) (n=20)			Pvt. hospitals (>300 bed strength) (n=20)			Pvt. hospitals (<300 bed strength) (n=20)		
	Red Triage	Yellow Triage	Green triage	Red Triage	Yellow Triage	Green triage	Red Triage	Yellow Triage	Green triage	Red Triage	Yellow Triage	Green triage	Red Triage	Yellow Triage	Green triage
Extremely satisfied	1 (6)	1 (7)	0 (0)	3 (21)	2 (13)	3 (20)	1 (8)	2 (15)	5 (36)	4 (24)	5 (26)	7 (39)	2 (18)	3 (23)	4 (29)
Very satisfied	6 (40)	6 (40)	5 (33)	3 (22)	6 (40)	6 (40)	3 (23)	4 (31)	4 (29)	7 (41)	9 (47)	5 (28)	7 (64)	7 (54)	6 (43)
Moderately satisfied	4 (27)	4 (27)	5 (33)	7 (50)	7 (47)	4 (27)	5 (38)	4 (31)	3 (21)	5 (29)	3 (16)	4 (22)	2 (18)	2 (15)	3 (21)
Slightly satisfied	3 (20)	3 (20)	4 (27)	1 (7)	0 (0)	2 (13)	4 (31)	3 (23)	2 (14)	1 (6)	2 (11)	2 (11)	0 (0)	0 (0)	1 (7)
Not at all satisfied	1 (7)	1 (6)	1 (7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (8)	0 (0)

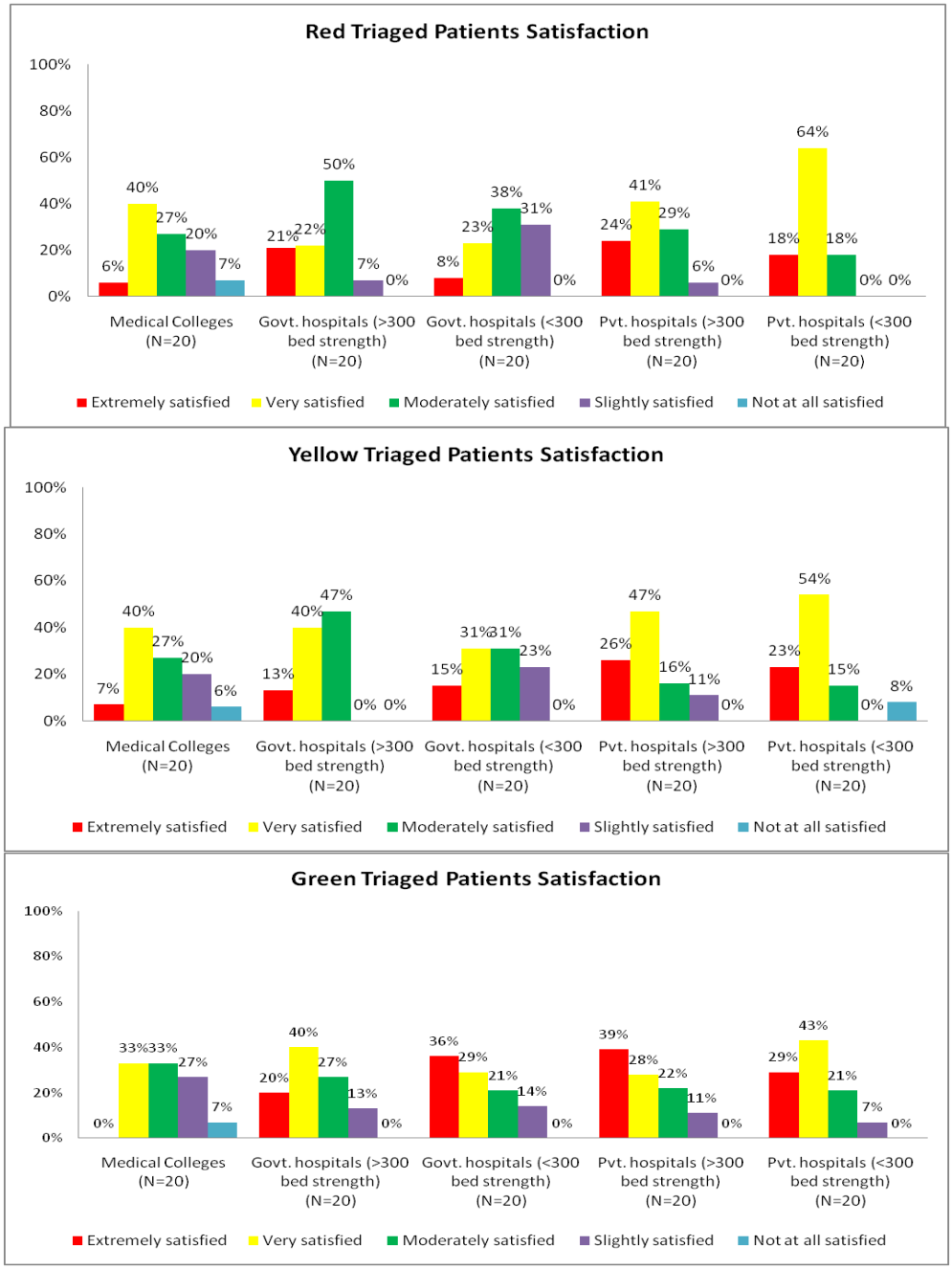
*n- number of hospitals

Figure 71: Chart of Patient Satisfaction by Hospitals Categories



***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

Figure 72: Representation of Triaged Patient Satisfaction for care provided by Hospital Categories



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.

It is clear from the table 60 and figure 73 that 55%hospitals have some referral policy, 53% hospitals provide proper arrangement to patients and assistance was provided in only 49% hospitals during referral.

Table 60: Summary of Referral of Patient by Hospital Categories: N (%)

Referral of Patients	Medical Colleges (n=20)		Govt. hospitals (>300 bed strength) (n=20)		Govt. hospitals (<300 bed strength) (n=20)		Pvt. hospitals (>300 bed strength) (n=20)		Pvt. hospitals (<300 bed strength) (n=20)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Any referral policy	2 (15)	11 (85)	11 (61)	7 (39)	12 (71)	5 (29)	15 (83)	3 (17)	15 (94)	1 (6)
Any proper arrangement	3 (23)	10 (77)	10 (56)	8 (44)	9 (53)	8 (47)	17 (94)	1 (6)	14 (93)	1 (7)
Any assistance during referral	4 (31)	9 (69)	8 (44)	10 (56)	7 (41)	10 (59)	15 (88)	2 (12)	15 (94)	1 (6)

*n- number of hospitals

Figure 73: Graphically representation of Referral of Patient by Category of Hospitals

Suggestions:

1. Develop National Forward and Backward Referral Policy with safe transport integrated with local EMS system
    a. Hub and Spoke Model (figure 74)
    b. Structured referral protocols
    c. There should be informed transfer.
2. NABH Accreditation

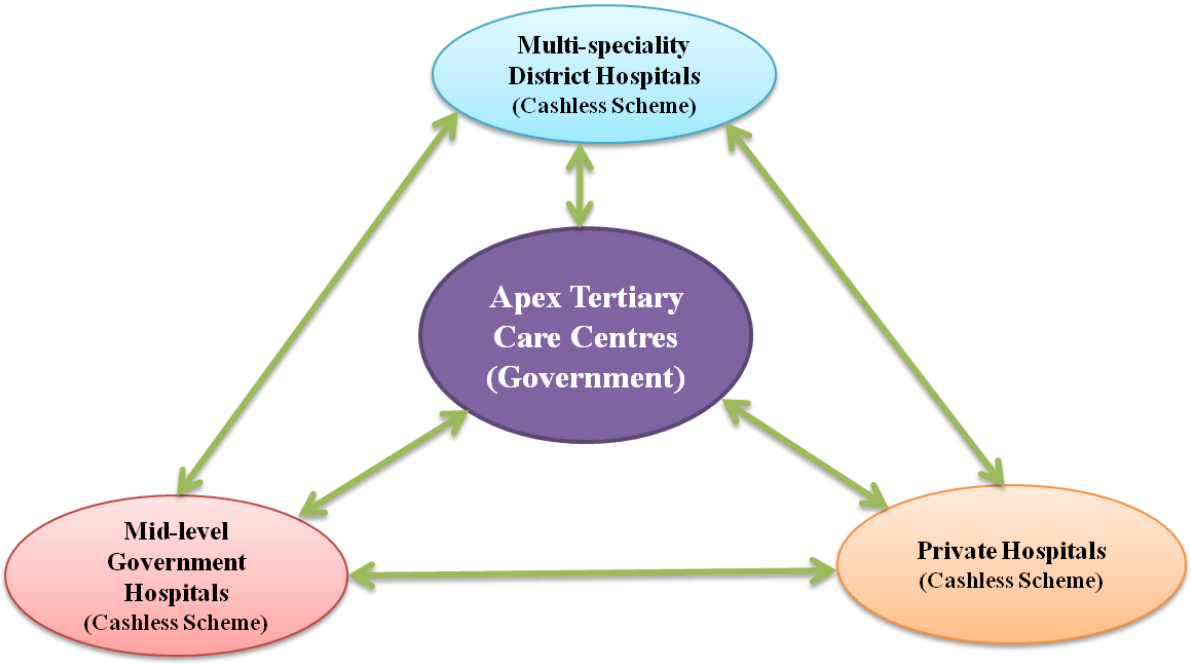
There should be a Standard Referral back policy (Standard Forward & Backward Policy) and it has to be in the form of hub and spoke model. In this policy, there should be a MOU of tertiary care centres with mid-level government hospitals with multi-speciality district hospitals as well as with private 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 74: Hub and Spoke Model for National Forward and Backward Referral Policy



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.

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 23% in medical colleges, 8% in government hospitals more than 300 beds, 13% in government hospitals less than 300 beds, 6% in private hospitals more than 300 beds and 25% in private hospitals less than 300 beds as shown in table 61.

The comparison of patients in OPD and emergency is represented in figure 75 for different categories of hospitals.

In medical college, the burden of patients needing emergency for 24 hours was maximum at SMS Medical College & Hospital and minimum at AIIMS, Bhopal.

In government hospitals >300 beds, the burden of patients in emergency was maximum at Indira Gandhi Government General Hospital, Puducherry and minimum at District Hospital, Dhamtari (for emergency) and Southern Railways Hospital, Chennai (for OPD).

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

In private hospitals >300 beds, the burden of patients in emergency was maximum at Dr Ram Manohar Lohia Hospital, Lucknow and minimum at Fortis Hospital, Rajasthan.

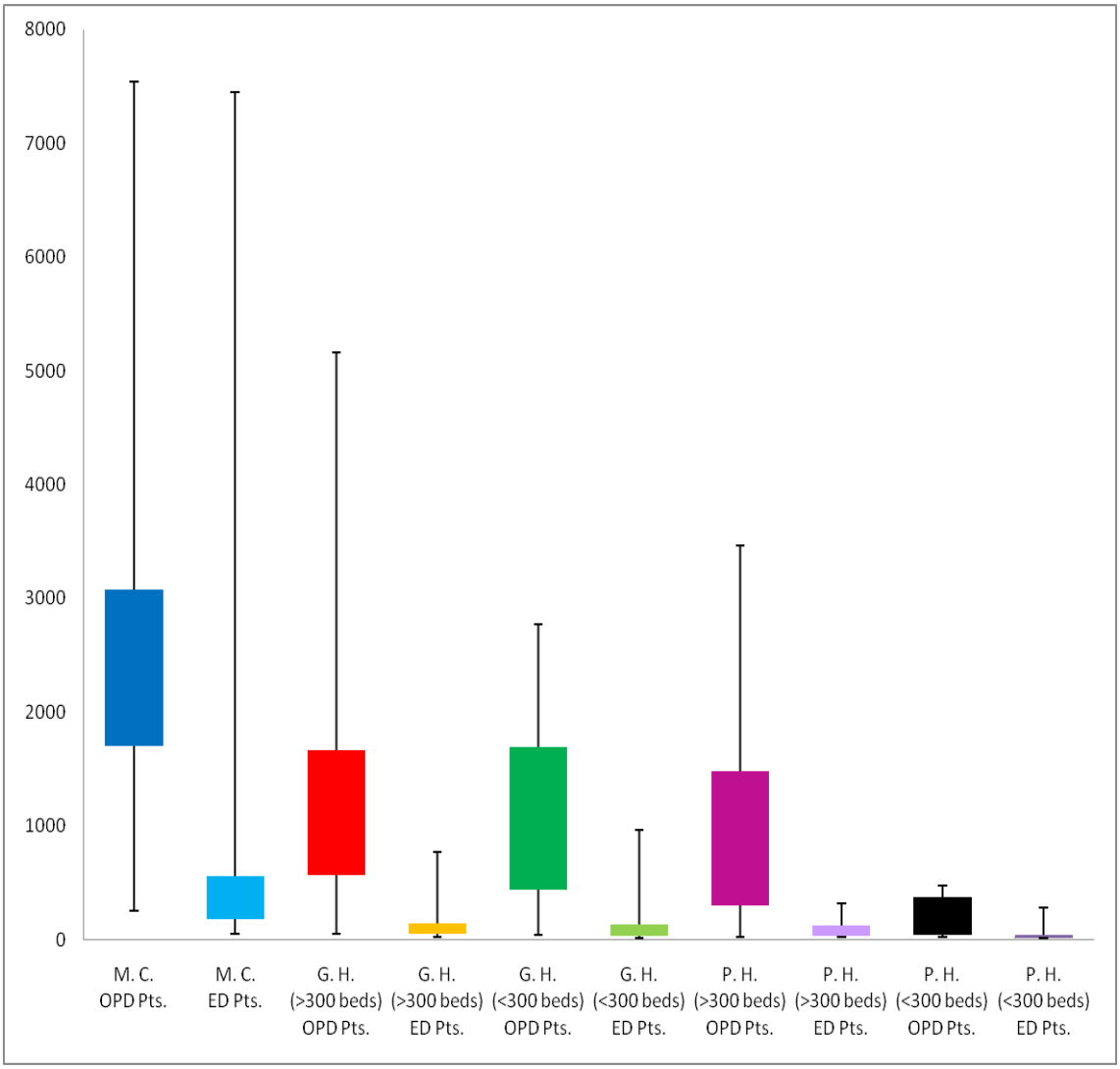
In private hospitals <300 beds, the burden of patients in emergency was maximum at Primus Super Speciality Hospital, Delhi and minimum at Jaipur Golden Hospital, Delhi.

Table 61: Summary of number of patients at OPD and Emergency during Single day (24 hours)

Hospital Categories	Total Emergency and Injury care Patients		OPD Patients other than emergency cases		% of ED Patients out of all patients visited in hospital
	n	Median [IQR] Min-Max	n	Median [IQR] Min-Max	
Medical Colleges	16	446 [376] 55-7450	15	1942 [1374] 250-7545	17%
Govt. Hosp. (>300 bed strength)	19	103 [92] 22-769	18	1223 [1095] 54-5164	11%
Govt. Hosp. (<300 bed strength)	15	103 [103] 15-960	14	820 [1261] 40-2769	11%
Pvt. Hosp. (>300 bed strength)	18	57 [87] 22-315	17	988 [1184] 27-3460	10%
Pvt. Hosp. (<300 bed strength)	16	25 [24] 13-285	14	102 [332] 22-476	30%

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

Figure 75: Comparison of Patients visited in OPD and Emergency in different Categories of Hospitals (ONE DAY)



*M. C.- Medical College, G. H.- Government Hospital, P. H.- Private Hospital, ED- Emergency department, OPD- Out patient visit department

2. Disposition Summary:

The disposition of patients in emergency department was also recorded by the team of assessors. In this, number of admissions, LAMA (Leave against Medical Advice), discharge, Death in ED for 24 hours was recorded by the team. The summary of the patient disposal from ED is shown in table 62 by categories of healthcare facilities.

Table 62: Summary of Disposition of Patients at emergency department (24 hours) by Category in the Healthcare Facilities: Median (% per total ED Visits)

Disposition of Patients from ED	Medical Colleges		Govt. Hosp. (>300 bed strength)		Govt. Hosp. (<300 bed strength)		Pvt. Hosp. (>300 bed strength)		Pvt. Hosp. (<300 bed strength)	
	n	Median (% Out of total ED visits)	n	Median (% Out of total ED visits)	n	Median (% Out of total ED visits)	n	Median (% Out of total ED visits)	n	Median (% Out of total ED visits)
Total Admissions	16	66 (15%)	16	24.5 (24%)	16	14 (13%)	15	21(37%)	15	13.5 (54%)
LAMA	19	3.5 (1%)	19	3 (3%)	19	3.5 (3%)	18	1 (2%)	18	3 (12%)
Discharge	15	55 (12%)	15	50 (49%)	15	17 (17%)	15	22.5 (39%)	15	6.5 (26%)
Death	18	2 (0%)	18	1.5 (1%)	17	1 (1%)	16	1 (2%)	16	1 (4%)
Death due to Trauma / injury / Road traffic accidents	15	2 (0%)	14	1 (1%)	16	3 (3%)	13	0 (0%)	13	1 (4%)

*n: Number of Hospitals, ED: Emergency department, LAMA: Leave against medical advice

3. 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.

3.1 Adult Patients:

In table 63, the summary of adult diseases reported at the emergency department for all categories of hospitals is depicted.

Table 63: Summary of Spectrum of Diseases for Adults by Category of Hospitals

Spectrum of Diseases for Adults	Medical Colleges (n=20)			Govt. Hosp. (>300 bed strength) (n=20)			Govt. Hosp. (<300 bed strength) (n=20)			Pvt. Hosp. (>300 bed strength) (n=20)			Pvt. Hosp. (<300 bed strength) (n=20)		
	N	Median [IQR] Min-Max	(% Out of total ED visits)	N	Median [IQR]Min-Max	(% Out of total ED visits)	N	Median [IQR] Min-Max	(% Out of total ED visits)	N	Median [IQR] Min-Max	(% Out of total ED visits)	N	Median [IQR] Min-Max	(% Out of total ED visits)
Chest Pain	144	5.5 [10.2] 1-46	1.23	85	3 [4.5] 1-28	2.91	51	3 [4.2] 2-15	2.91	84	4 [4.2] 1-13	7.02	40	2 [2.5] 1-15	8
Stroke	75	5 [5] 1-42	1.12	19	1 [1] 1-10	0.97	25	3 [3] 1-9	2.91	30	2 [1.5] 1-9	3.51	14	1 [1.5] 1-5	4
Altered Mental Status	136	18 [25] 1-70	4.04	59	3 [3] 1-17	2.91	20	3 [1.5] 1-5	2.91	27	2 [1] 1-6	3.51	16	1 [1] 1-4	4
Trauma/Road traffic accident/injuries	599	18 [25] 1-210	4.04	175	5 [10.5] 1-45	4.85	130	4.5 [6] 1-40	4.37	143	3 [10] 1-35	5.26	60	3 [4] 1-20	12
Respiratory Distress	165	9 [21] 2-40	2.02	144	6.5 [8.2] 1-38	6.31	62	4 [9] 1-17	3.88	83	6.5 [4.5] 2-22	11.40	41	4 [4] 1-7	16
Pain in Abdomen	232	13 [13] 2-72	2.91	164	7 [7.5] 1-36	6.80	161	15 [17] 1-27	14.56	123	8 [5] 2-18	14.04	48	3 [4] 1-11	12
Poisoning	67	2.5 [6.7] 1-30	0.56	115	2 [3.5] 1-79	1.94	6	1 [0.5] 1-3	0.97	20	3 [4.7] 1-6	5.26	3	1 [0] 1-1	4
Snake Bite	38	1 [4] 1-21	0.22	24	4 [2] 2-10	3.88	4	1 [0.5] 1-2	0.97	10	4 [2] 1-5	7.02	1	1 [0] 1-1	4
Fever	206	8 [24] 1-36	1.79	262	11.5 [12.7] 1-72	11.17	251	12 [15] 2-80	11.65	148	6 [7] 1-42	10.53	65	4 [7] 1-13	16
Pregnancy related	200	26 [25] 1-140	5.83	41	4.5 [3] 2-10	4.37	15	2 [0.7] 1-5	1.94	43	2 [2] 1-30	3.51	3	1.5 [0.5] 1-2	6

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

It was observed that the trauma care (1101 patients) accounted for the maximum number of patients visiting in hospital emergency department followed by those with complaints of fever (932 patients).

In medical colleges, the trauma care accounted for the maximum number of patients visiting in hospital emergency department followed by those with complaints of pain in abdomen.

In government hospitals >300 beds, the maximum number of patients visiting in hospital emergency department accounted for complaints of fever followed by those of trauma care patients.

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

In private hospitals (both >300 beds and <300 beds), the maximum number of patients visiting in hospital emergency department accounted for complaints of fever followed by those of trauma care patients.

3.2 Pediatric Patients:

In table 64, the summary of pediatric diseases reported for all categories of hospitals is depicted.

Amongst pediatric patients, it was observed that the maximum number of patients visiting in hospital emergency department accounted for complaints of fever (443 patients) followed by those of diarrheal diseases (290 patients).

Table64: Summary of Spectrum of Diseases for Pediatrics in all Categories of Hospitals

Spectrum of Diseases for Pediatrics	Medical Colleges (n=20)			Govt. Hosp. (>300 bed strength) (n=20)			Govt. Hosp. (<300 bed strength) (n=20)			Pvt. Hosp. (>300 bed strength) (n=20)			Pvt. Hosp. (<300 bed strength) (n=20)		
	N	Median (IQR) Min-Max	(% Out of total ED visits)	N	Median (IQR) Min-Max	(% Out of total ED visits)	N	Median (IQR) Min-Max	(% Out of total ED visits)	N	Median (IQR) Min-Max	(% Out of total ED visits)	N	Median (IQR) Min-Max	(% Out of total ED visits)
Respiratory Distress	115	6 [11.5] 1-35	1.35	47	4 [5.5] 1-21	3.88	11	2 [1] 1-3	1.94	28	1 [3.7] 1-18	1.75	35	2 [14.5] 2-31	8
Diarrheal Disease	86	3.5 [11.7] 1-25	0.78	34	3 [2] 1-7	2.91	35	3 [2] 2-9	2.91	29	2 [2] 1-16	3.51	106	2 [26.5] 1-101	8
Altered Mental Status	19	1.5 [1.5] 1-7	0.34	2	1 [0] 1-1	0.97	3	1.5 [0.5] 1-2	1.46	6	3 [2] 1-5	5.26	1	1 [0] 1-1	4
Trauma/Road traffic accident/injuries	43	6 [5] 1-10	1.35	16	2 [2] 1-5	1.94	34	4 [3] 1-17	3.88	11	1 [1] 1-4	1.75	18	3 [6.5] 1-14	12
Seizure	29	2 [4] 1-10	0.45	12	1.5 [1] 1-5	1.46	7	2 [0.2] 1-2	1.94	10	1 [1] 1-5	1.75	3	1.5 [0.5] 1-2	6
Pain in Abdomen	102	2 [4]	0.45	33	2 [1]	1.94	20	3 [2.5] 1-5	2.91	24	2 [1.2] 1-12	3.51	15	15 [0] 15-15	60

		1-12			1, 12										
Poisoning	13	4 [0.5] 4-5	0.90	0	0	0.00	0	0	0.00	2	2 [0] 2-2	3.51	2	2 [0] 2-2	8
Snake Bite	4	1 [0.5] 1-2	0.22	0	0	0.00	4	2 [1] 1-3	1.94	1	1 [0] 1-1	1.75	0	0	0
Fever	159	6 [23.5] 1-47	1.35	70	3 [4] 1-26	2.91	35	2 [2.5] 1-11	1.94	67	5 [10] 1-21	8.77	112	2 [2] 1-105	8

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

In medical colleges, the maximum number of patients visiting in hospital emergency department accounted for complaints of fever followed by those with respiratory distress.

In government hospitals >300 beds, the maximum number of patients visiting in hospital emergency department accounted for complaints of fever followed by those with respiratory distress.

In government hospitals <300 beds, the maximum number of visiting in hospital emergency department patients accounted for complaints of fever and diarrheal disease followed by those of trauma patients.

In private hospitals (both >300 beds and <300 beds), the maximum number of patients visiting in hospital emergency department accounted for complaints of fever followed by those with diarrheal patients.

COMPARISON OF EMERGENCY CARE SERVICES IN VARIOUS SYSTEMS

Comparison of emergency care in various systems

1. Hospitals with Academic Emergency Medicine (n=5):

In this study, 5 medical colleges were selected which have academic emergency medicine in their Post-Graduation programme.

The following observations were obtained during assessment from these hospitals with academic emergency medicines:

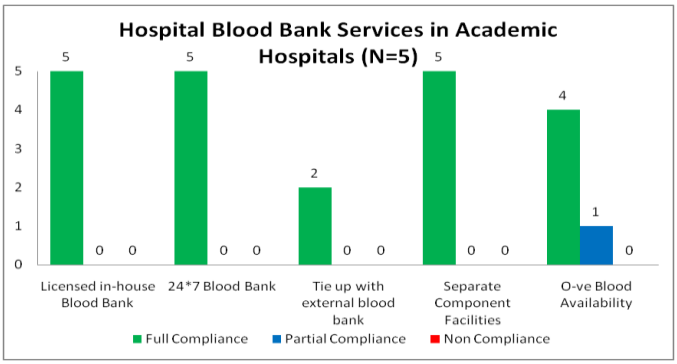
Strengths at Hospitals with Academic Emergency Medicine:

1. They have 24*7 blood bank facility available (figure 76)
2. Adequate manpower in emergency
3. Definitive care services were observed well with proper ICU facilities in hospitals with academic emergency medicine (figure 77)
4. They have disaster management plan with surge capacity, also conduct drill and debriefing (figure 78)
5. Majority of them have triage policy
6. They conduct continuous education and periodic training programs for staff to improve quality (figure 79)
7. They have dedicated staff for gap identification and loop closure.
8. They have key indicators for quality monitored.
9. They have computerized data management system (figure 80)
10. They have good communication skills in ED with satisfaction of majority of patients (figure 83)
11. They have referral policy due to tie-up with local EMS system (figure 84)

Need to improve:

1. Emergency care protocols were missing (figure 84)
2. Lack of separate decontamination area (figure 78)

Figure 76: Summary of Hospital Blood bank in hospitals with academic emergency medicine and without academic emergency medicine



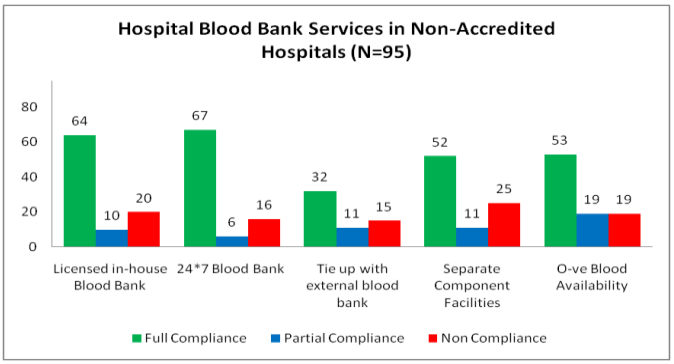


Figure 77: Summary of Definitive Care Services in hospitals with academic emergency medicine and without academic emergency medicine

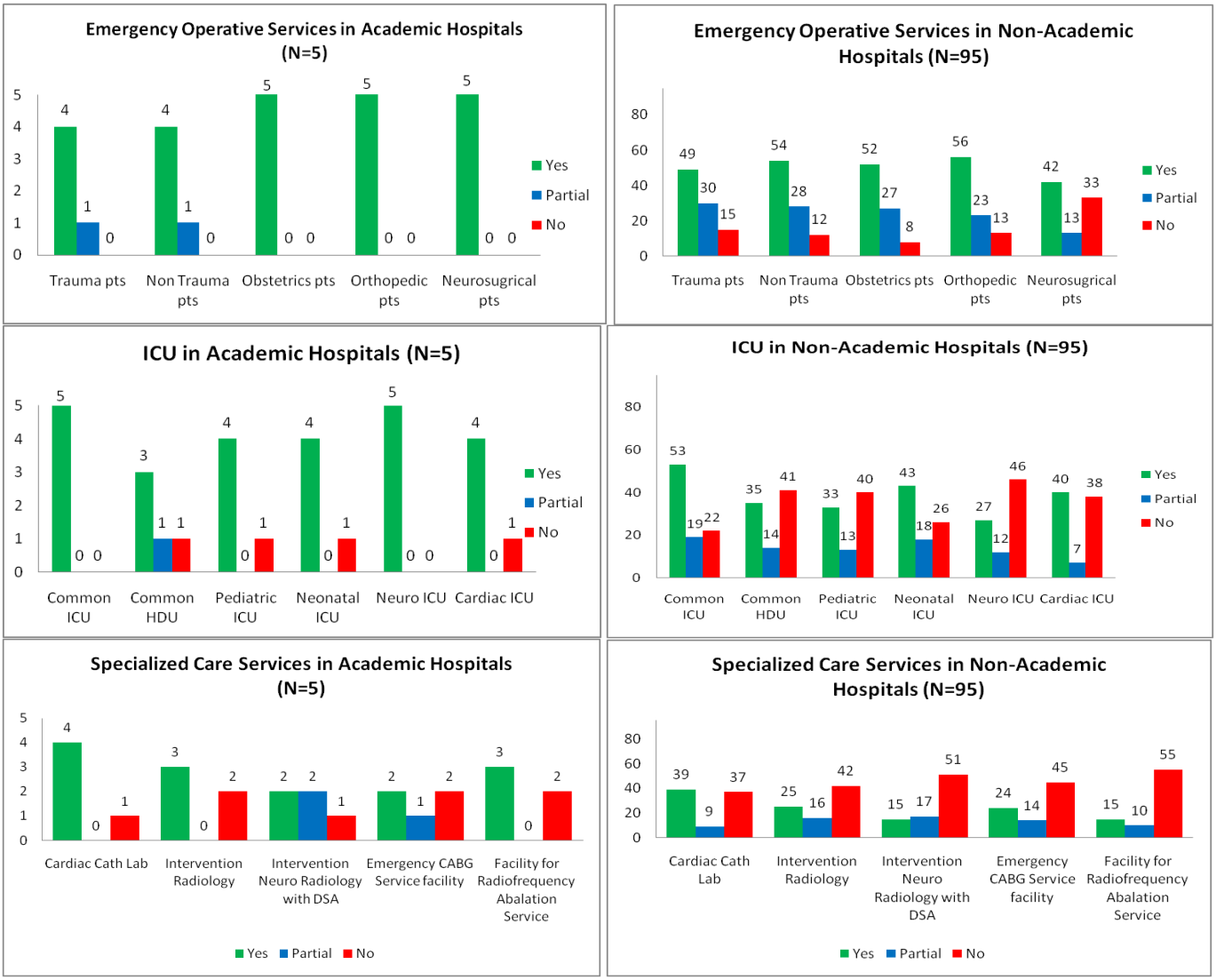
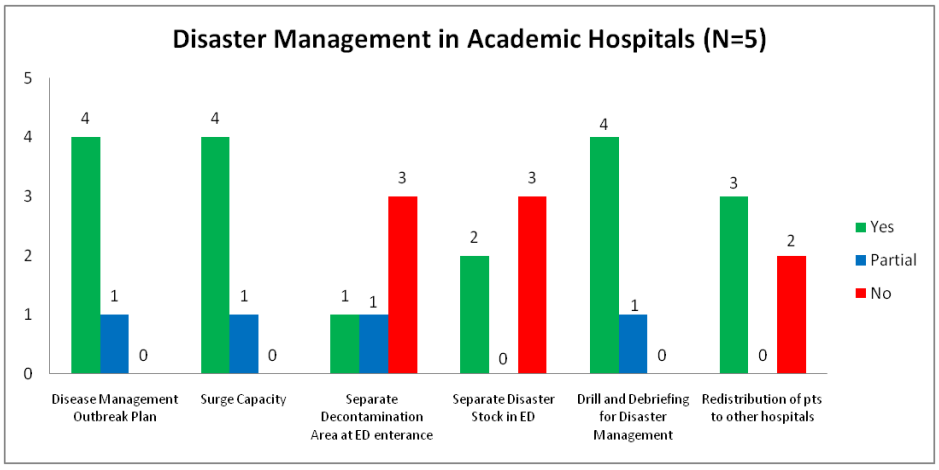


Figure 78: Summary of Disaster Managementin hospitals with academic emergency medicine and without academic emergency medicine



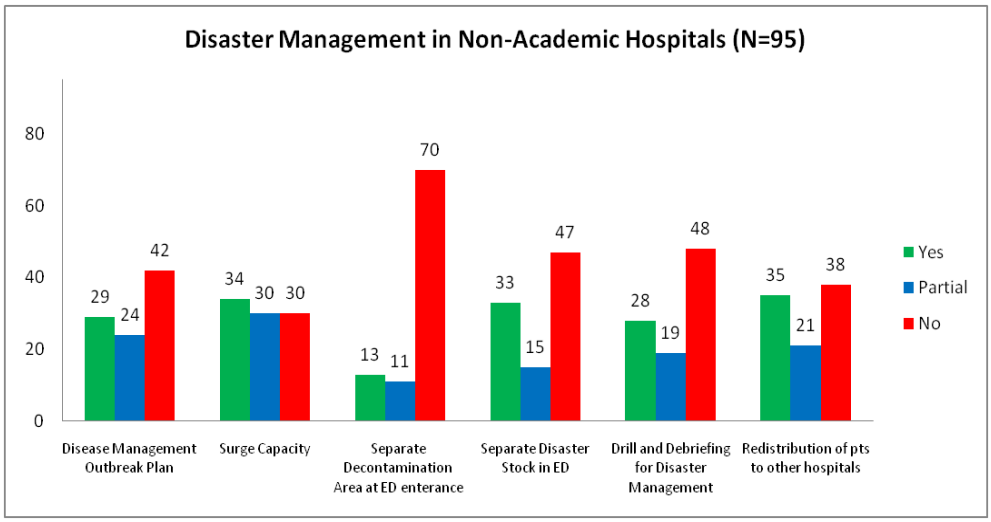
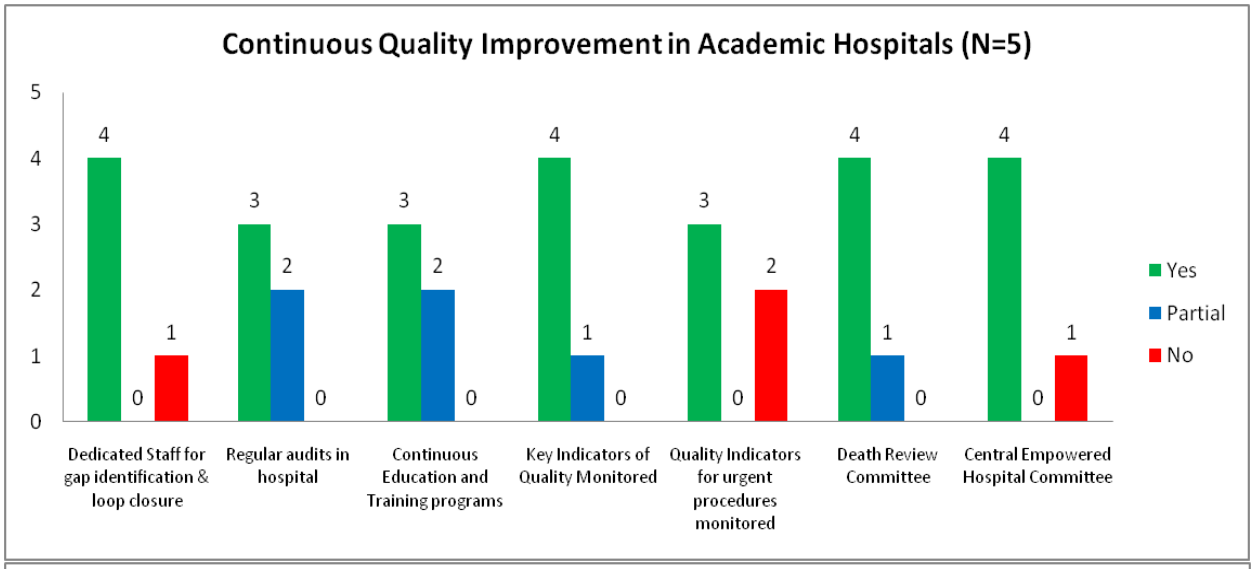


Figure 79: Summary of Continuous Quality Improvement in hospitals with academic emergency medicine and without academic emergency medicine



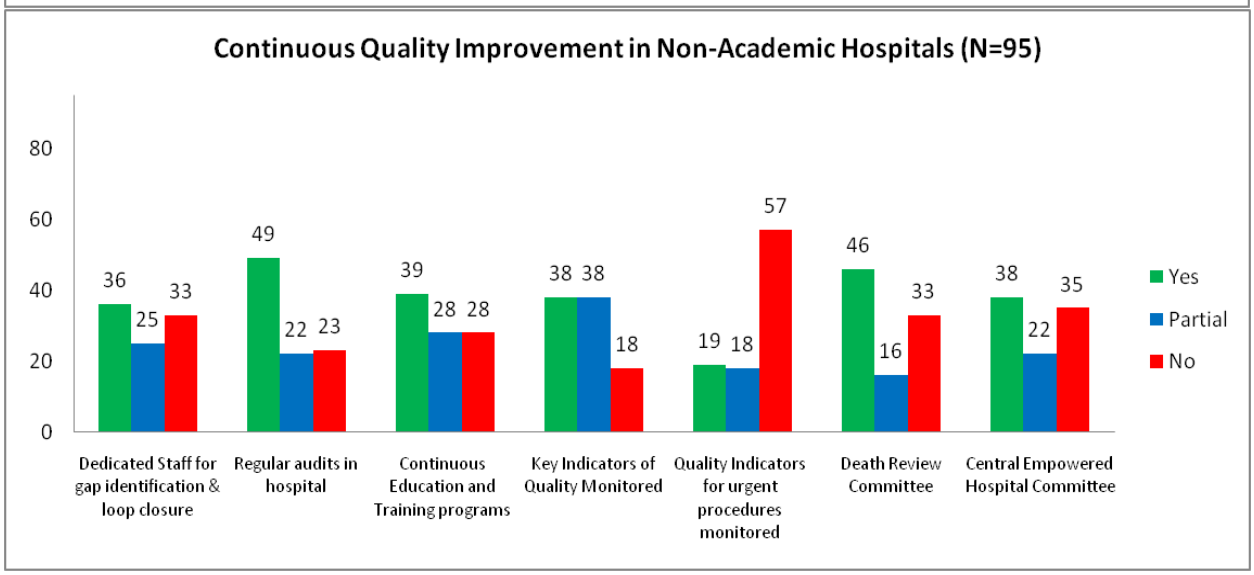


Figure 80: Summary of Computerized Data Management System in hospitals with academic emergency medicine and without academic emergency medicine

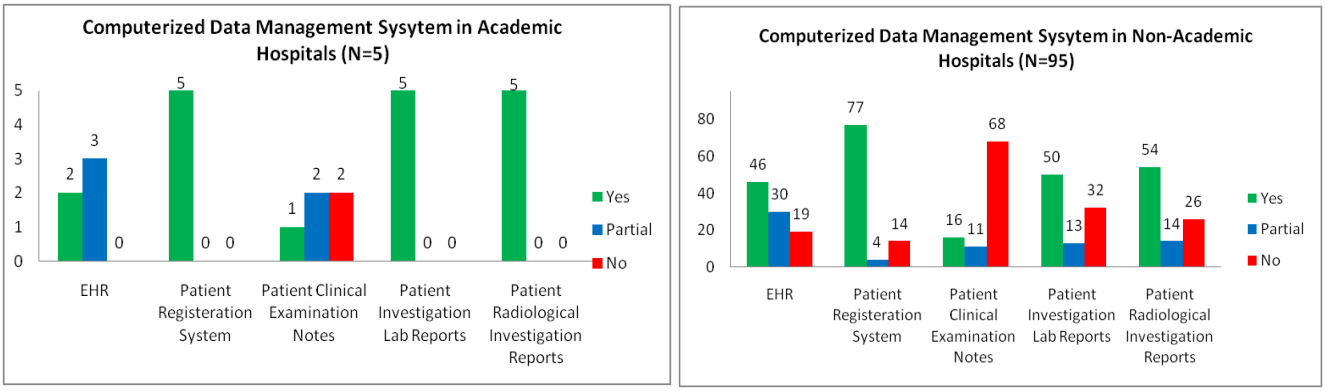


Figure 81: Summary of Communication Skills in ED in hospitals with academic emergency medicine and without academic emergency medicine

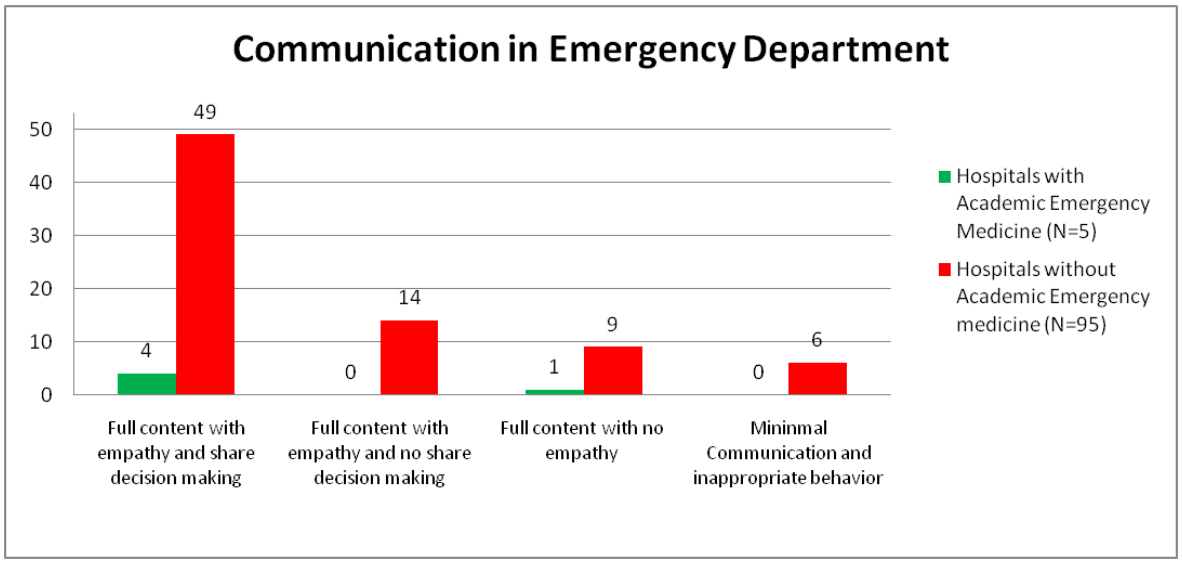


Figure 82: Summary of Referral Policy in hospitals with academic emergency medicine and without academic emergency medicine

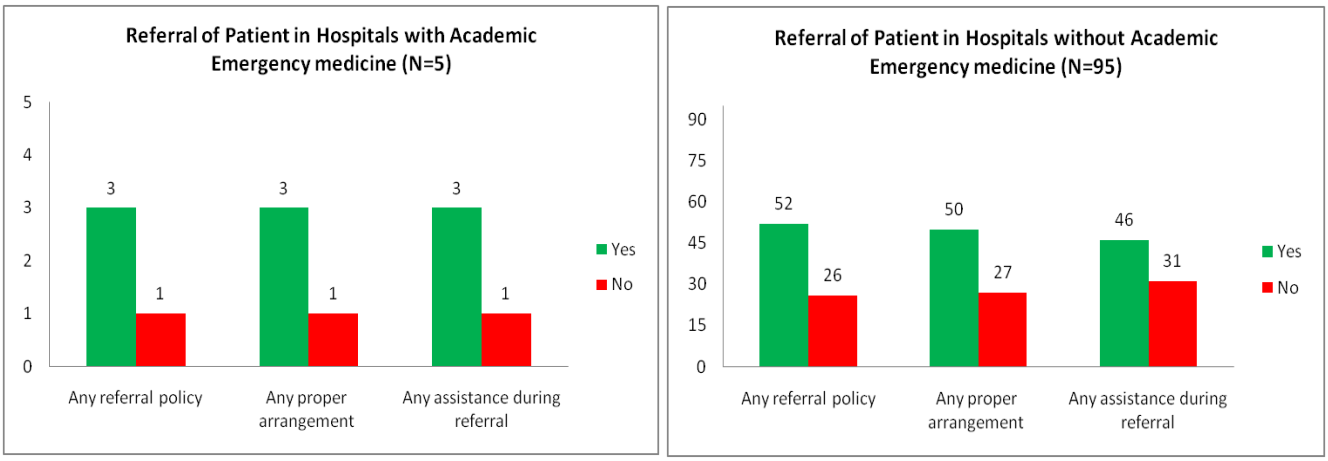
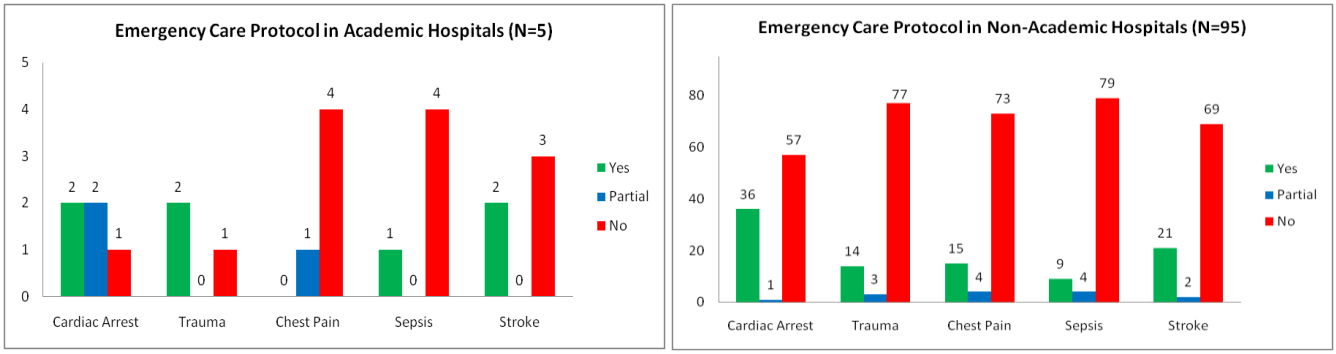


Figure 83: Summary of Emergency Care Protocols in hospitals with academic emergency medicine and without academic emergency medicine



2. Govt. Secondary care v/s Tertiary care Hospitals:

Out of 100 hospitals, 34 were district hospitals (secondary care centres) and 25 were government tertiary care centres from various states of our country. The following observations were obtained during assessment from district hospitals:

Strengths:

- 50% have 24*7 blood bank facility available (figure 84)
- Some of hospitals (6) have separate ED blood storage (figure 85)
- 25% have 24*7 emergency operative services (figure 86)
- Compliance for ED protocol/SOP/guidelines were good, when compared to tertiary care government hospitals (figure 87)
- Some of them conducted periodic mock drill and training of staff (figure 88)
- Regular audits conducted in mostly district hospitals
- Communication in ED and patient satisfaction of district hospitals were good, when compared to tertiary care government hospitals
- Majority have good referral policy with assistance during referral (figure 89)

Figure 84: Summary of Hospital Blood Bank in Secondary Care Centres

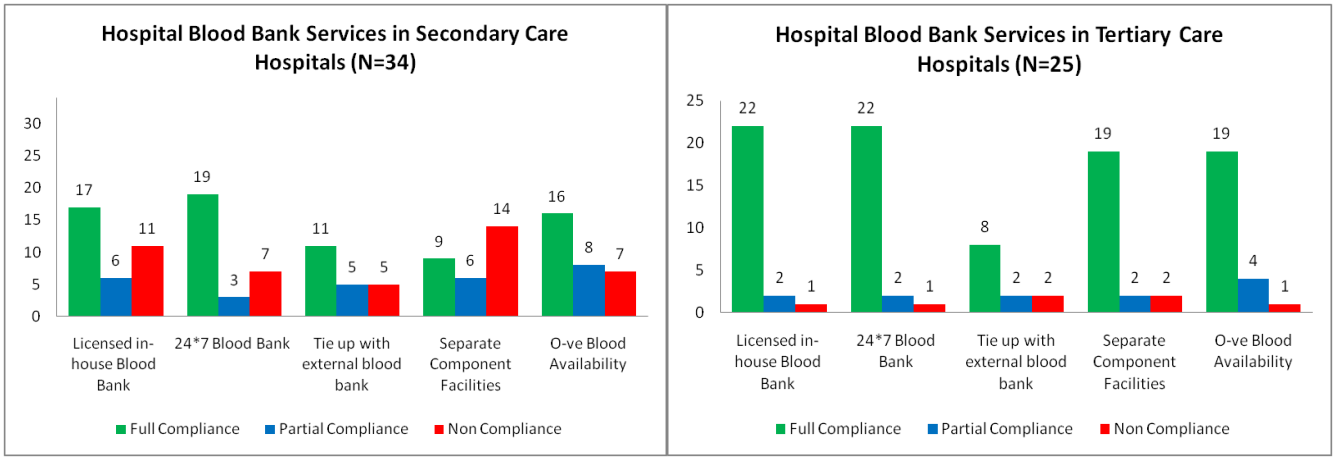


Figure 85: Summary of Hospital Blood protocols in Secondary Care Centres

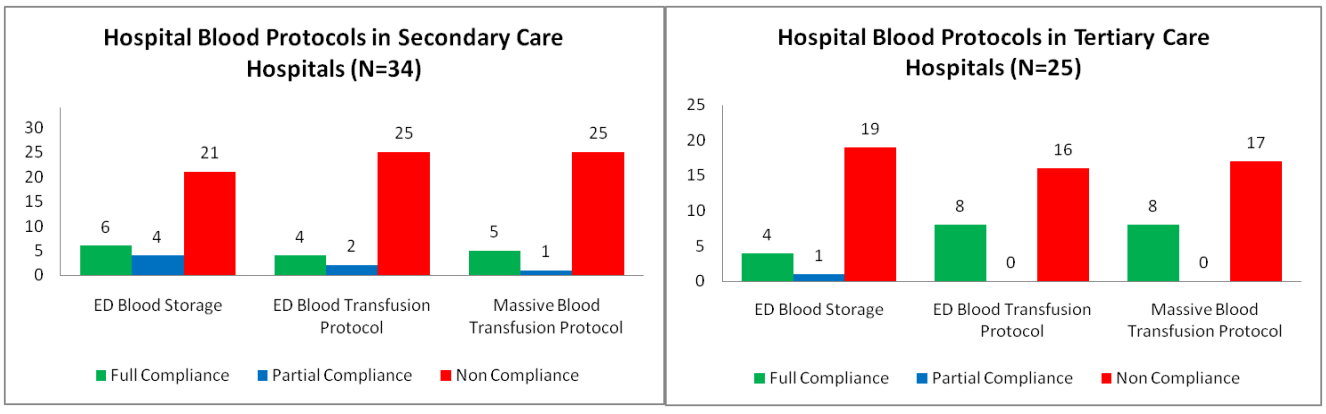


Figure 86: Summary of Emergency Operative Services in Secondary Care Centres

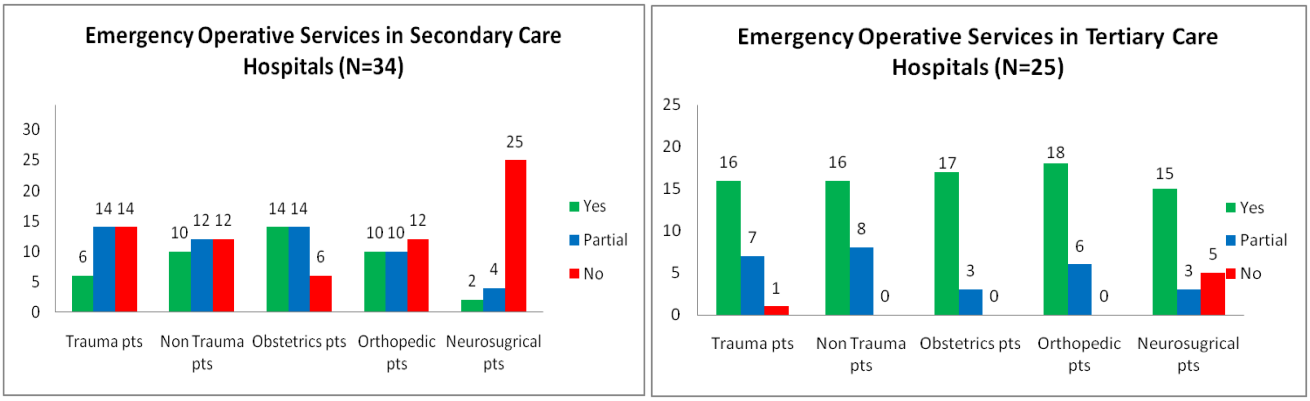
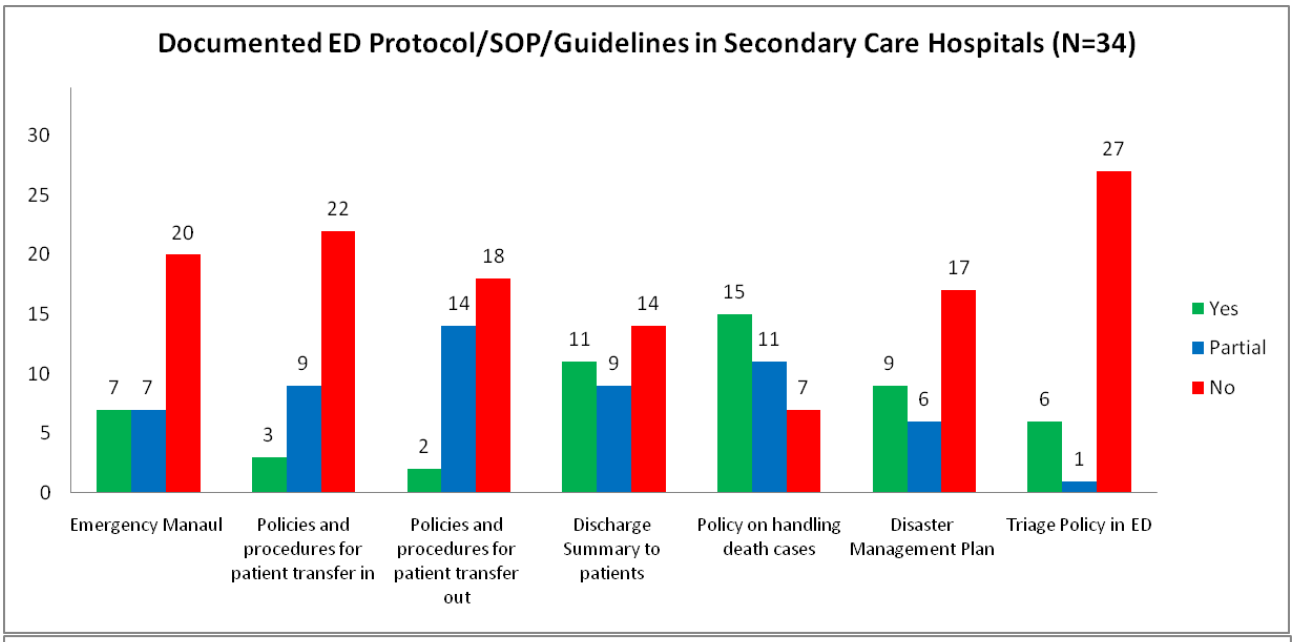


Figure 87: Summary of ED Protocols / SOP / Guidelines in Secondary Care Centres



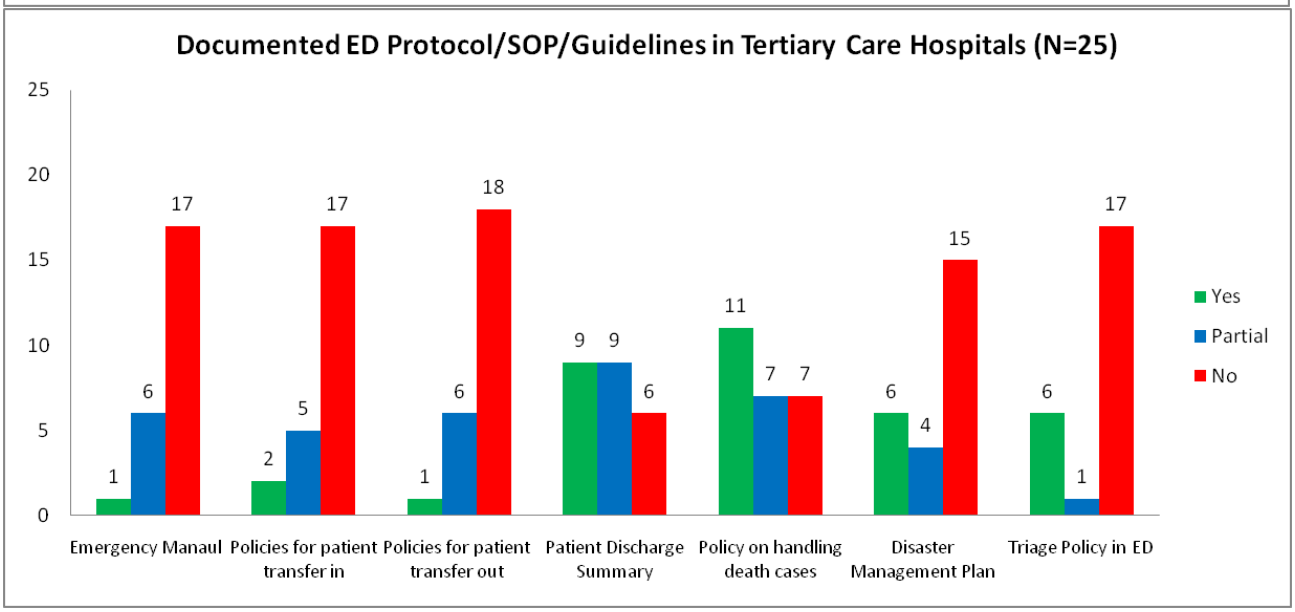


Figure 88: Summary of Continuous Quality Improvement in Secondary Care Centres

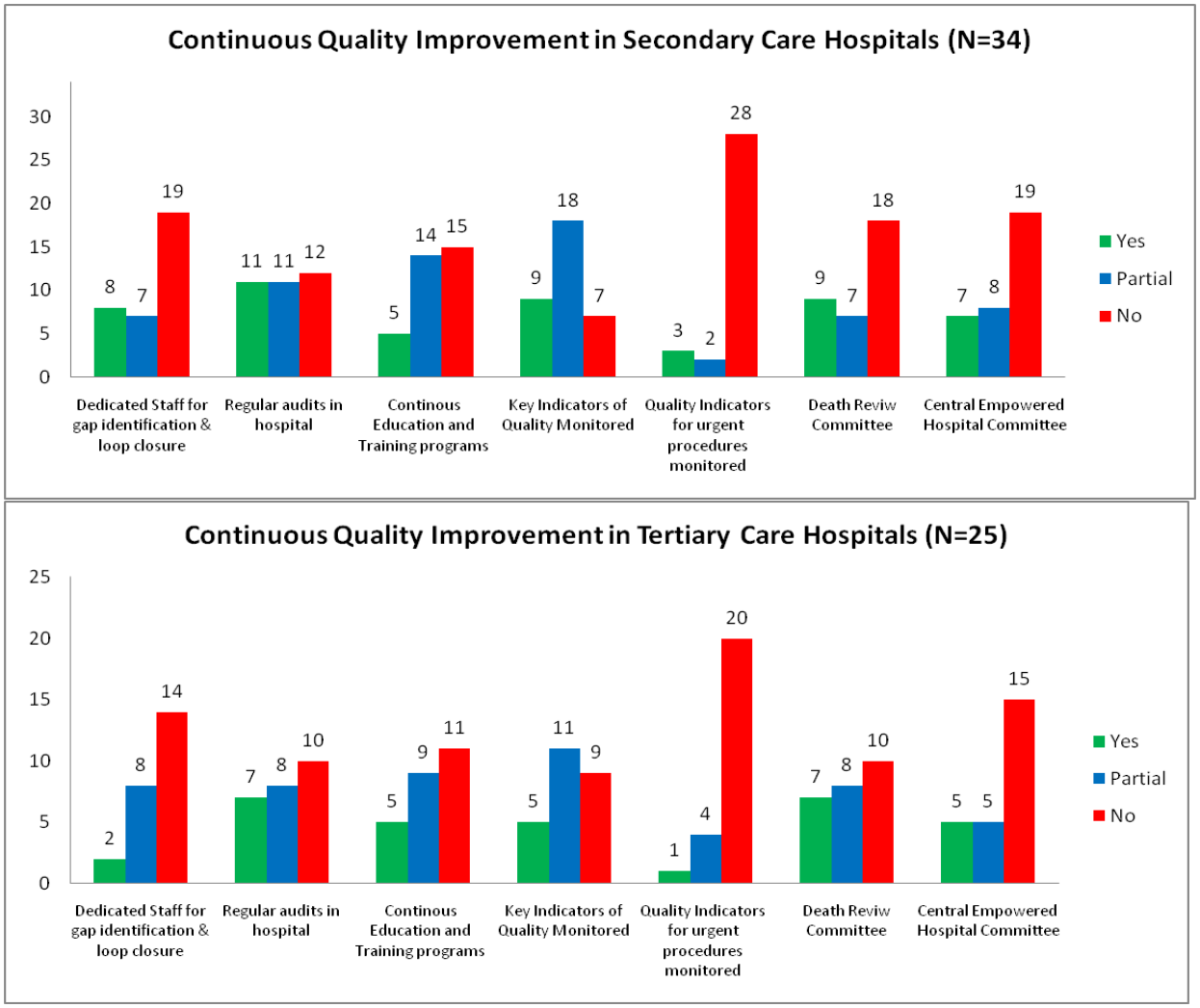
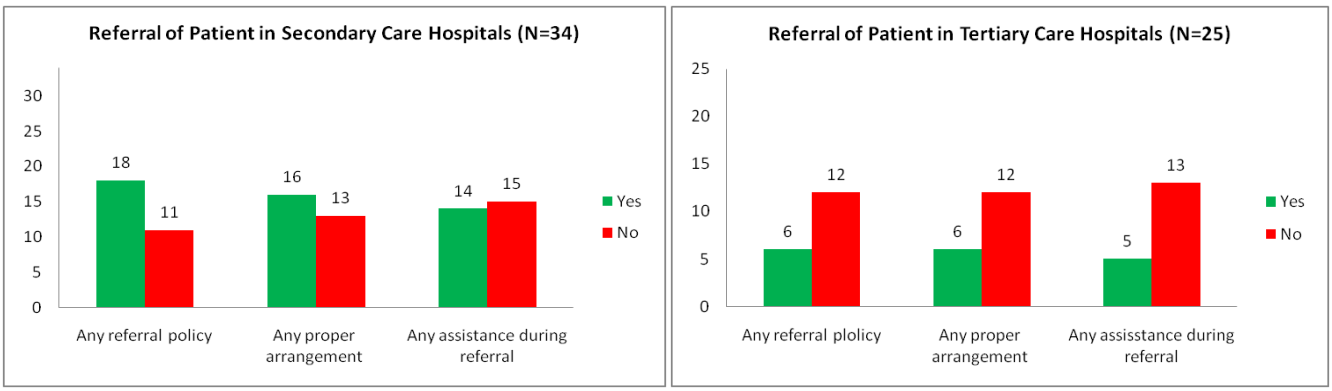


Figure 89: Summary of Referral Policy in Secondary Care Centres



Need to improve:

- Lack of blood transfusion protocols (figure 85)
- Lack of common ICU with PICU and NICU (figure 90)
- Lack of computerized data management system (figure 91)

Figure 90: Summary of Critical Care Services in Secondary Care Centres

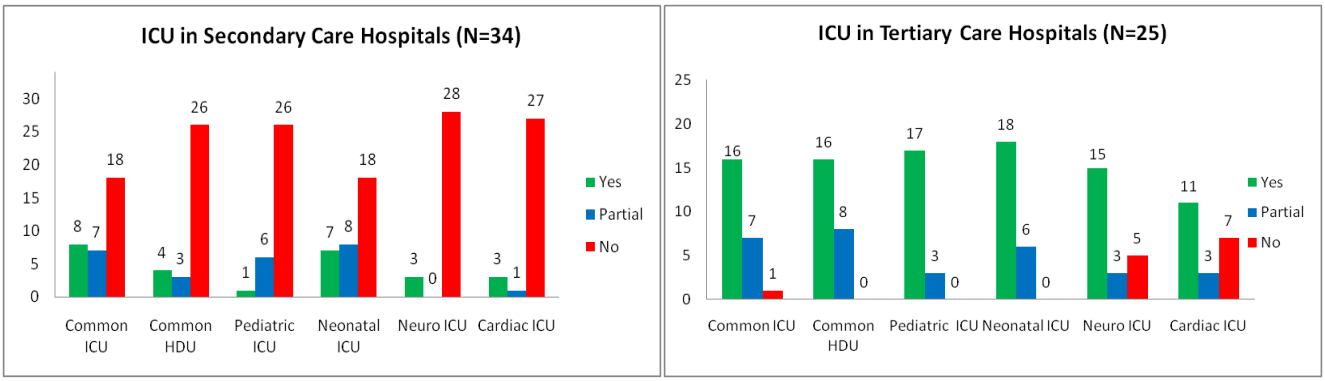
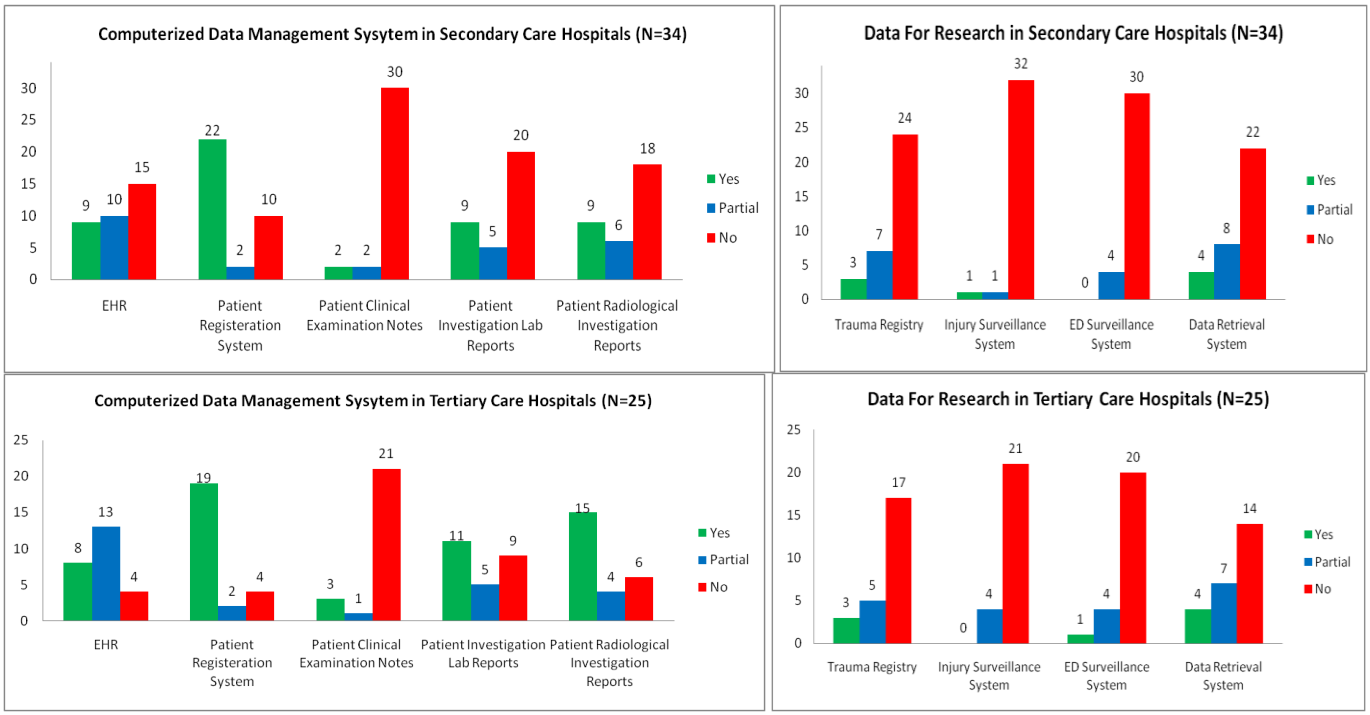


Figure 91: Summary of Computerized Data Management System in Secondary Care Centres



****Note: Comparison of District Hospitals >300 beds and <300 beds has done as a separate study**

3. Private Hospitals vs Government Hospitals

In this study, 60 hospitals were government hospitals and 40 hospitals were private hospitals out of 100 hospitals. The following observations were obtained during assessment from these hospitals were as follows:

Key point of checklist	Government hospitals (n=60)	Private hospitals (n=40)	Figure
Blood bank facility availability	65%	75%	10
ED and massive blood transfusion protocol	17%	25%	10
Emergency operative services	37%	77%	12
Periodic mock drill	15%	57%	29
Periodic training programs for staff	18%	77%	29
Regular audits	32%	82%	35
Communication in ED	40%	72%	71
Referral policy	42%	75%	74

4. NABH accredited vs non-NABH accredited Hospitals

In this study, 28 hospitals were NABH accredited out of 100 hospitals; all NABH accredited hospitals were private. The following observations were obtained during assessment from these hospitals having NABH Accreditation:

Strength:

- They have 24*7 blood bank facility available.
- They have ED and massive blood transfusion protocols.
- They have good definitive care services.
- They have all types of ED protocols/SOP/guidelines with triage (figure 25).
- These hospitals conduct continuous education and periodic training programs for staff (figure 37).
- Periodic mock drill also conducted in these hospitals (figure 31).
- Majority have computerized data management system (figure 40).
- Management of time sensitive conditions is good as compared to non-NABH accredited hospitals (figure 58, 63, 67)
- They also have referral policy

Compliance of individual hospitals to the checklist

A checklist encompasses the following parameters was checked for all the hospitals studied. The details are attached as Annexure VII.

The hospitals which scored 75% or above were found satisfactory and marked green, the score of 50% to 74% requiring improvement was marked yellow and score of less than 50% in an area were marked red. The areas in red suggested the need for an intervention on priority.

DISCUSSION

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 all hospitals have an average of 3%-5% emergency beds. On the other hand, the annual burden of patients visited in emergency is 10-30%, which is much more than the available emergency beds present in hospitals.

A major concern was that only a few facilities at any level of care had ED blood storage, protocols for massive blood transfusion and ED blood transfusion. A major gap in definitive care services was that nearly all government hospitals (<300 bed strength) do not have common ICU.

Another major concern was the lack of protocols/SOP/guidelines for emergency department. Nearly all government hospitals and medical colleges do not have emergency care protocols (alert system for different diseases) and most of the government hospitals and medical colleges 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 at most of the hospital at any levels of care.

Also, gaps were observed in data management systems: most of the government hospitals and medical colleges do not have trauma registry systems; while ~40% private hospitals have trauma registry system. Nearly all government hospitals and medical colleges do not have injury and ED surveillance system and most of the private hospitals also do not have injury and ED surveillance system.

A major concern was lack of-provision of allocated budget (Central/ State Government) to finance emergency care systems were observed at nearly all facilities at all tiers. The available few allocated budget at a few locations pertained specifically for delivery of goals related to trauma care.

There were lack of optimal availability of human resource, essential medicines, critical care equipments and supplies at various levels. Of these, the most critical gaps were scarcities related to doctors, paramedics, adherence to essential drug list at ED and essential emergency care equipments such as cervical collar, transport ventilator, resuscitation medicines, etc. Many of the frequently absent equipment were inexpensive items, which would save lives in many emergency conditions.

Amongst the issues related to human resource, it was found that most of the hospitals had adequate number of general duty doctors and specialists; deficiencies still prevailed in the emergency department. This was probably due to lack of importance given to the emergency care services as a separate standalone independent unit/department. Further, most of the posted doctors at the ED were the most junior doctors, with least experience, that too on a rotational basis-corroborating further with the aforementioned facts. The recent MCI mandate to develop standalone EDs at all Medical Colleges should at least partially address these issues. But a larger change in attitude of administrators, policy makers and doctors is required to bring about significant changes.

Additionally, major gaps were found in physical infrastructure both within and in immediate outside surrounding areas of emergency departments that could be easily rectified with minimal budget. These gaps such as independent direct access to ambulance services from the ED and demarcated area for triage amongst others would be able to save lives by improving efficiency of delivery of care. Most of these could be achieved by minimally altering the prevailing infrastructures.

Of the prevailing gaps in the infrastructure, lack of availability of a separate 24*7 point of care lab for ED was prevalent at most of the health facilities. This is a critical deficiency, since availability of timely lab results is crucial for management of patients with medical emergency conditions, wherein time is of paramount importance.

The strengths of this study were the fact that this was the first systematic study of prevailing facility based emergency and trauma care services in the country. The study has been conducted in a robust manner covering all zones of the country by assessors trained in pre-specified standardized tools in an unbiased way. The health facilities assessed covered all possible strata and levels of care.

There are a few 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. However, this was partially compensated by live observations by the assessors. Second, most of the facilities did not have inherent electronic data systems to capture historic information and these had to be culled from other sources and by Delphi methods.

CONCLUSIONS

CONCLUSIONS

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

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 levels in India. All these gaps are 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

SUMMARY OF KEY SUGGESTIONS EMERGING FROM THE STUDY

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 Forensic Nursing in nursing college / 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	• But for running acute care services, we need blood bank services for 24*7 in all hospitals. • Majority of district hospitals have blood bank however the round the clock service is missing in many of them, due to lack of staff. • Emergency blood storage is mandatory for those medical college and district hospitals (>300 beds) which deals with more trauma cases
Hospital Definitive Care Services	• Medical colleges should have all types of emergency operative, critical care as well as specialized care services for 24*7 • 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

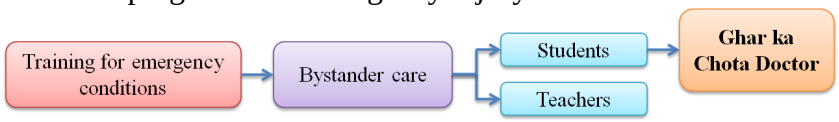
Hospital Ambulance Services	• The in-hospital ambulances should be optimally utilized in the common resource pool of EMS (Emergency medical Service) of the region as per requirement. • Regular maintenance of ambulance should be done. • The ALS ambulances can be used for mobile stroke unit as well as 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 • Increase the scope of Good Samaritan Law from road traffic injuries to other time sensitive conditions
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 • During third party audits, if any essential drug is missing from the resuscitation package then the license of the hospital may be cancelled
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.

KEY POLICY RECOMMENDATIONS

SUGGESTED KEY POLICY RECOMMENDATIONS

These findings were suggestive for the following suggestions:

1. **Develop a robust integrated emergency care system including injuries:** The current policy focus (which is predominately trauma-centric) should be leveraged to deliver comprehensive emergency and trauma care services in an integrated manner, without losing the gains achieved in delivery of trauma care services through-out the Nation.
2. **Standardize the Protocols / SOP and Guidelines including Triage:** The policies, protocols and guidelines for emergency department should be standardized across all EDs in the country, irrespective of their levels of care. The key for achieving this is a availability of standardized universal emergency-care manual at the point of care. This manual should contain- information for management of all anticipated emergency medical conditions with updated SOPs, protocols and flow charts. Specific focus should also be given for critical issues such as triage, handling of critical equipments, norms for optimal care delivery. If feasible, these should also be available in a ready-to-use handy app format, which can be downloaded on a mobile phone.
3. **Adequate Space allocation for Emergency and Injury Care:** Adequate space should be allotted for emergency department in each hospital as per the footfall. The critical needs for establishment of such a department should be met at all hospitals.
4. **Develop Standardize Emergency Department:** There is a need to develop a blue print for a standalone standardized department of emergency medicine for various levels of care, for the Nation. These norms need to be adapted after a consensus is achieved.
5. **Establish Academic Emergency Medicine departments:** This is the need of the hour to ensure continuous ongoing medical education and development of skills for doctors, nurses and paramedics. Further, development of such departments will be the key to enhance research to provide further policy directions.
6. **Continuous Training and Skill Development of ED Staff:** There should be capacity building of doctors, nurses and paramedics. The emergency care providers should be trained for life saving skills with structured courses such as: ACLS, BLS, PALS, ATLS or NELS, Point of care emergency ultrasound; with periodic refresher courses, to ensure continuous skilling of defined core competencies.
7. **Accreditation of all Emergency and the health facility for providing quality care:** There should be accreditation of all EDs and health facility for delivering and improving the quality care. Regular quality checks on a specified format should be ensured to enhance the performance of emergency care.
8. **Upgradation and maintenance of existed Emergency and Health facility:** The ED is like a mini-hospital and 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 with pre-hospital notification, so that the patients could be transferred to appropriate health facility based on the level care needed for the underlying disease condition.

9. **Pooling of Ambulances (Integration and aggregation of ambulances):** The in-hospital ambulances should be optimally utilized as a common resource pool for providing EMS services for the entire -local region, as per requirement.
10. **Optimization of Resources (manpower, infrastructure, supplies and medicines):** Since many of the gaps in optimization of resources needed for optimal emergency care services can be achieved with minimal budgetary requirements, it is recommended that phasing of the needs be done, so as to achieve early low hanging fruits. Some of these examples include reallocation of available human resources, minimal alteration of existing infrastructure to provide access to ambulance vehicles and creation of a demarcated area for triaging.
11. **Protected Funding for Emergency and Injury Care as well as for developing academic department / DNB Emergency Medicine:** Separate budget head needs to be created for emergency care services. One option is to augment the prevailing funds for trauma care to encompass overall emergency care delivery.
12. **Cashless care for all red triaged patients in all hospitals:** Policy for caring of all emergency conditions for all citizens of the Nation for the initial critical period to ensure early clinical stabilization is a way forward to achieve Health for all and SDGs.

NOTE: To carry forward the above recommendations, it is suggested that in the first phase, these may be implemented at 30 existing facilities which have a functional emergency department and trauma care facility. The lessons learnt from this endeavour can act as template to give further directions.

PHASE-I SUGGESTED KEY POLICY RECOMMENDATIONS

- Uniformity of name - Emergency or Emergency Medicine Department
- Create an empowered Hospital Committee, which have composition of different disciplines and headed by Hospital in-charge/Medical Superintendent. The member secretary should be Head of the Emergency Department.
- Reorganize of the existing emergency department for comprehensive management of all emergency conditions, at all tiers of healthcare facilities depending on the anticipated footfall of patients.
- Initiate Quality Improvement (QI) programmes.
- Implement triage policy.
- Initiate processes to capture data related to emergency care at each hospital.
- Ensure 24*7 availability of adequate dedicated emergency staff such as doctors, nurses and paramedics.
- Optimize infrastructure and supplies from within the available resources and create a roadmap for futuristic needs with timelines.
- Ensure on-going training and skilling of doctors, nurses and paramedics.
- Develop standardized care delivery template for time sensitive conditions.
- Develop a robust pre-hospital care system linked with facility based emergency care services.
- Create a separate protected fund/ budget to address the immediate concerns regarding critical supplies and equipment’s needs of the Emergency Department.

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ANNEXURE-I

LIST OF HOSPITALS

Zone	S. No.	State	Medical College	Government Hospital more than 300 beds	Government Hospital less than 300 beds	Private Hospital more than 300 beds	Private Hospital less than 300 beds
NORTH ZONE	1	Jammu & Kashmir	Sher-i-Kashmir Institute of Medical Sciences, Srinagar	District Hospital Hospital, Barahmulla	District Hospital Ganderbal, Ganderbal	-	-
	2	Himachal Pradesh	IGMC, Shimla	District Hospital (Deen Dayal Upadhyay Hospital), Shimla	-	-	-
	3	Punjab	Guru Nanak Dev Hospital & Govt. Medical College, Amritsar	Jallianwala Bagh Martyr's Memorial Civil Hospital, Rambagh	-	Fortis Hospital, Mohali	Shivam Hospital, Multi Super Speciality Hospital, Hoshiarpur
	4	Uttarakhand	-	HNB Base Hospital	Coronation Hospital, Dehradun	-	-
	5	Utttar Pradesh	-	Civil Hospital-Lucknow	-	RML Hospital, Lucknow	Charak Hospital Dubagga
	6	Chandigarh	-	Government Superspeciality Hospital, Sector-16	Civil Hospital Sector-22, Chandigarh	-	Max Superspeciality Hospital, Mohali
	7	Rajasthan	SMS Medical College & Hospital, Jaipur	Hari Baksh Kanwatia Hospital, Jaipur	Govt. BDM Hospital, Kotputli	Fortis Hospital, Jaipur	Birla Hospital-CK Birla, Jaipur
	8	Delhi	-	-	-	Yashoda hospital, Kaushambi	Indian Spinal Injuries Centre
						Asian Hospital	Medeor Hospital, Manesar
						Sri Ganga Ram Hospital	Jaipur Golden Hospital
						Artemis Hospital	Primus Super Speciality Hospital
ZONE WEST	1	Gujarat	BJ Medical College & Civil Hospital, Ahemdabad	GMERS Medical College & Hospital, Gotri, Vadodara	Jamanabai Government Hospital, Mandvi	Parul Sewasharam Hospital, Vadodara	Bhailal Amin General Hospital, Vadodara

	2	Maharashtra	BJ Medical College & Sassoon General Hospital, Pune	-	Sri Seva Medical foundation Dr Jogalekar Hospital, Shirwal, Pune	Grant Medical Foundation Ruby Hall Clinic, Pune	-
	3	Madhya Pradesh	AIIMS, Bhopal	Jai Prakash District Hospital, Shivaji Nagar, Bhopal	-	-	Bhopal Fracture Hospital, Bhopal
	4	Chhattisgarh	-	District Hospital, Dhamtari	District Hospital, Tikarpara, Raipur	-	Ramkrishna CARE Hospital, Pachpedhi
	5	Goa	Goa Medical College, Panaji	-	North Goa District Hospital, Mapusa	-	-
EAST ZONE	1	Bihar	PMCH, Patna	AIIMS Patna	Sadar Hospital, Gaya	Paras HMRI Hospital, Patna	Ruban Memorial Hospital Patliputra
	3	Orissa	-	AIIMS, Bhubneshwar	District Headquarter Hospital, Puri	Capital Hospital, Bhubneshwar	Care Hospital, Bhubneshwar
	4	West Bengal	IPGMER & SSKM	-	-	-	Ruby General Hospital
NORTH EAST ZONE	1	Sikkim	New STNM-Govt- medical college, Sikkim	-	Singtam District Hospital	Central Referral Hospital, Gangtok	-
	2	Arunachal Pradesh	TomoRiba Institute of Health & Medical Sciences, Papumpare	-	BakinPertin General Hospital, Pasighat	-	Ramakrishna Mission Hospital, Itanagar
	3	Assam	Gauhati Medical College and Hospital, Guwahati	-	Morigaon Civil Hospital	GNRC Hospital, Guwahati	NemcareSuperspecialty Hospital, Guwahati
	4	Meghalaya	-	Civil Hospital Shillong	-	-	-
	5	Nagaland	-	-	District Hospital, Peren	-	Christian Institute of Health Science and Research
	6	Manipur	RIMS, Imphal	-	District Hospital, Bishnupur	-	Shija Hospital & Research Institute, Lamphelpat, Imphal

	7	Tripura	Agartala Government Medical College & G B Pant Hospital	-	Gomti District Hospital, Udaipur	Tripura medical college& BRAM Teaching Hospital, Agartala	-
	8	Mizoram	-	Zoram Medical College	Civil Hospital, Aizawl	Synod Hospital (Presbyterian Hospital)	-
SOUTH ZONE	1	Telangana	-	District Hospital, Karim Nagar, Hyderabad	District Hospital, King Koti, Hyderabad	Yashoda Hospital, Malakpet, Hyderabad	-
	2	Karnataka	Mysore Medical College & Krishna Rajendra Hospital, Mysuru	Victoria Hospital, Bengaluru	Government Hospital, Virajpet	Manipal Hospital, Bengaluru	-
	3	Andhra Pradesh	Guntur Medical college & Government General Hospital	Government District Hospital, Tenali	-	Kasturi Medical College & Hospital	Lalitha Super Specialty Hospital, Kothapet, Guntur
	4	Kerala	Trivandrum Govt Medical College	District Hospital, Neyyattinkara	District Hospital, Peroorkada	Cosmopolitan Hospitals Pvt Ltd	G G Hospital
	5	Tamil Nadu	Madras Medical College	Madras Railway Hospital, Madras (Southern Railway Headquarters Hospital)	-	Apollo Hospital	-
	6	Pondicherry	JIPMER, Pondicherry	Indira Gandhi Government General Hospital, Pondicherry	-	-	-

ANNEXURE-II

STUDY TOOL

SECTION A: BACKGROUND INFORMATION OF THE HOSPITAL:

Date of Inspection:

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

2. DEFINITIVE CARE SERVICES(Score: 1-No, 2- Partial, 3- Yes)

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

SN.	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	

3. HOSPITAL AMBULANCE SERVICES(Score: 1-No, 2- Partial, 3- Yes)

SN.	OBJECTIVE ELEMENTS	Check point		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) SCORE	

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.)	a) SCORE b) SCORE c) SCORE	d) 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	a) SCORE	b) 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.	a) SCORE b) SCORE c) SCORE	d) 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.	a) SCORE b) SCORE c) 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.)	a) 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.	a) SCORE	b) REMARKS
7.	a) Do you have documented disaster management plan? b) If no, which procedure you follow?		a) 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)

SN	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)

SN	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	a) Do you have separate disaster stock in ED? b) If yes, for how many patients (e.g. 50, 100)?	Admin interview/ Facility visit [Medical supplies, manpower, medicines etc.]	a) SCORE b) 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)

SN.	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)

SN.	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)

SN	Objective points	Check point
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	People are using as parking lot Score

Score

	front of emergency department?	
4.	Does the hospital have separate access for ambulance services?	Sufficient space for Ambulance offloading and turn-around
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.	a) Do you have functional male toilets? b) Do you have functional female toilets? c) 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) a) 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
1.	Do you have emergency department with adequate space as per patient load (Circulation space and open space)?	Admin interview / 1000 m^2 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	Score

	for nursing staff?	

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)

SN.	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, SPO_2[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 i*ncubators?*	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)

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

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? **Yes/No**

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 **Very** **Moderately** **Slightly** **Not at all**

Satisfied	Satisfied	Satisfied	Satisfied	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……..

2. For Patient in **Green 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……..

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 24Hours

Health Facility Name:-	Time:	Date:

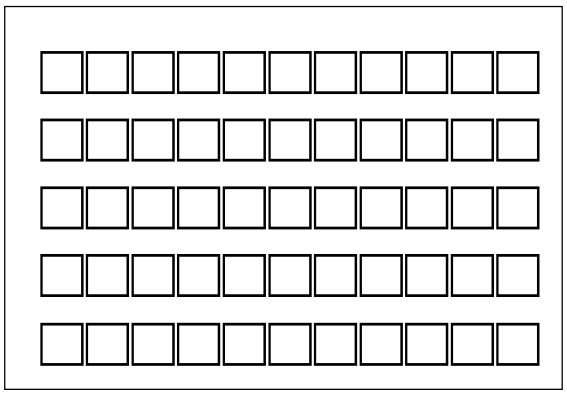
Total Patients visited in Hospital for last 24 Hours Numbers	Adult-	Pediatric- (please write the cut off age)
Total Number of Patients visited in Emergency Department for last 24 Hours Numbers	Adult-	Pediatric- (please write the cut off age)

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)

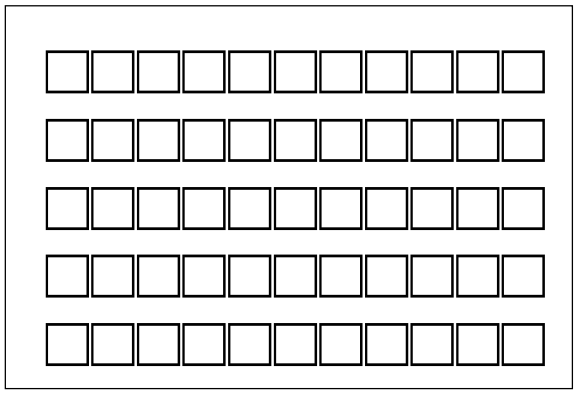
Adult Patients

(Please tick one check box for one patient)

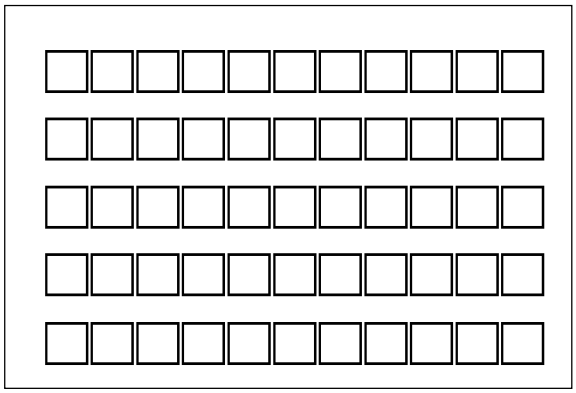
1. Chest Pain Patients



2. Stroke



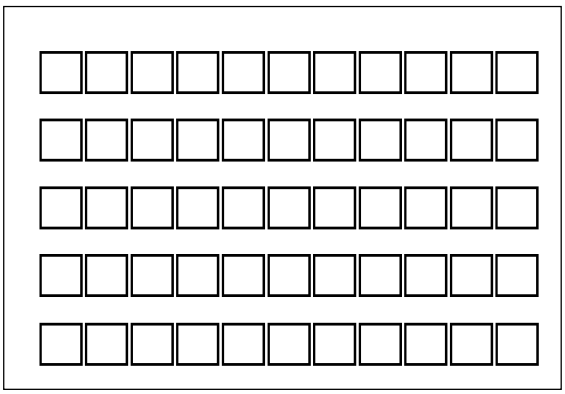
3. Altered Mental status



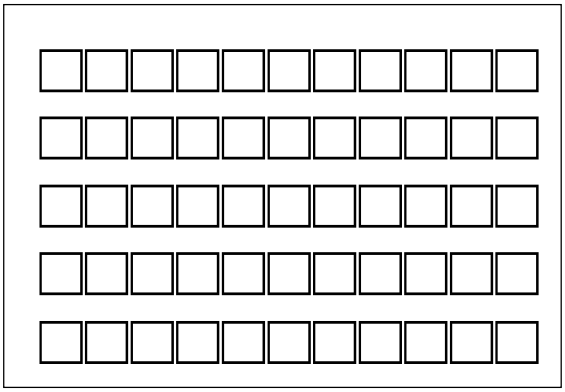
Pediatric Patients

(Please tick one check box for one patient)

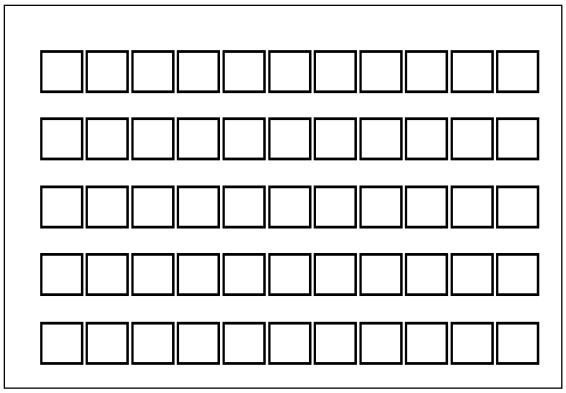
1. Respiratory distress



2. Diarrheal disease



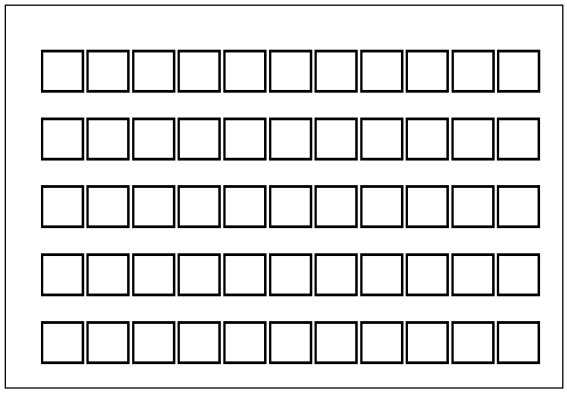
3. Altered Mental status



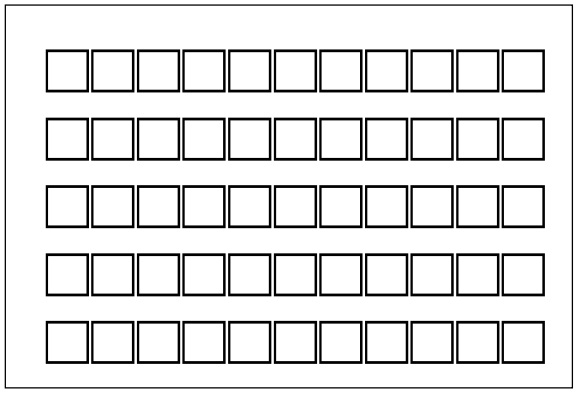
Adult Patients

(Please tick one check box for one patient)

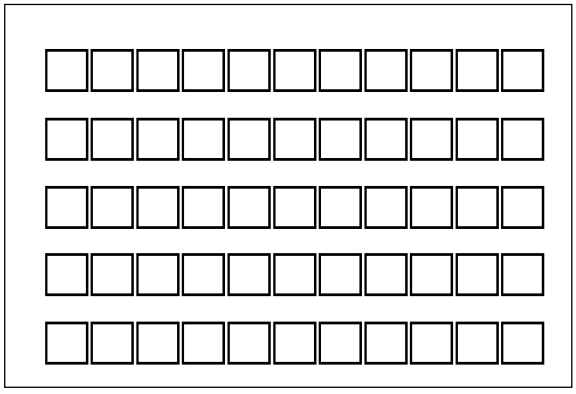
4. Trauma/ Road Traffic Accidents/Injuries



5. Respiratory Distress



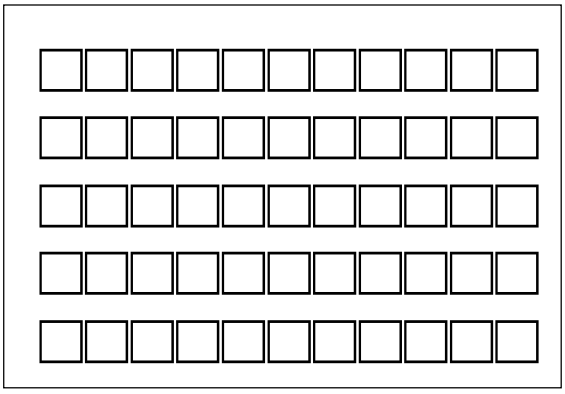
6. Pain abdomen



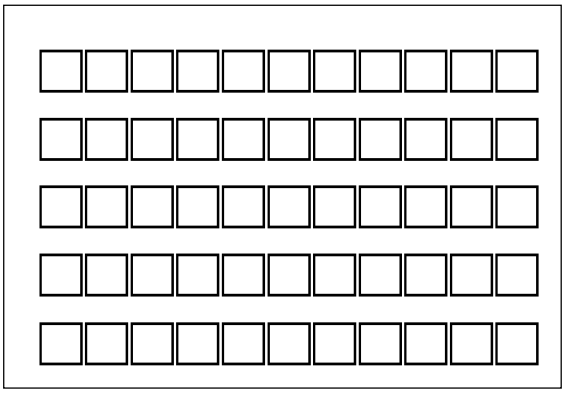
Pediatric Patients

(Please tick one check box for one patient)

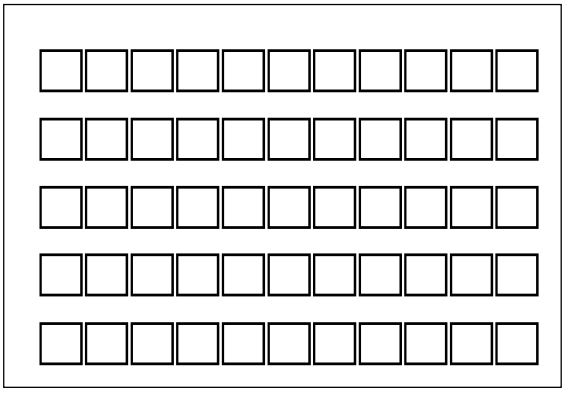
4.Trauma/ Road Traffic Accidents/Injuries



5. Seizure



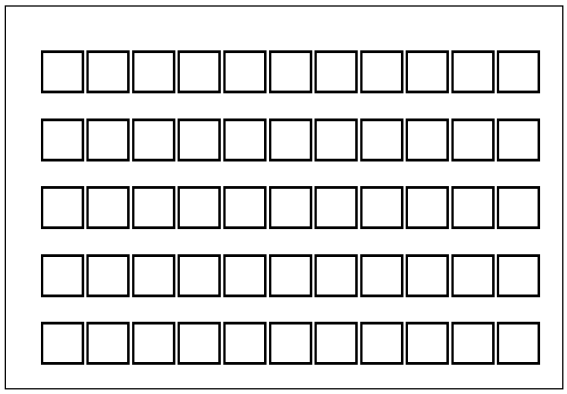
6. Pain abdomen



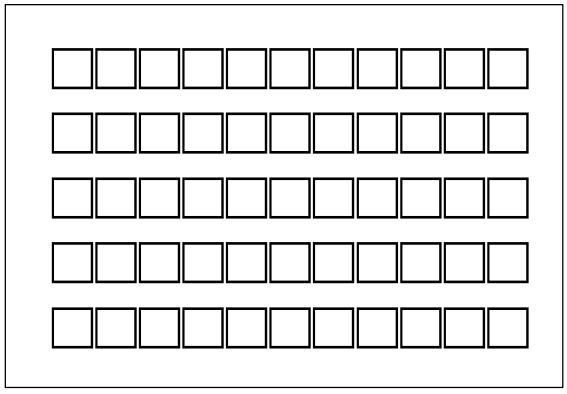
Adult Patients

(Please tick one check box for one patient)

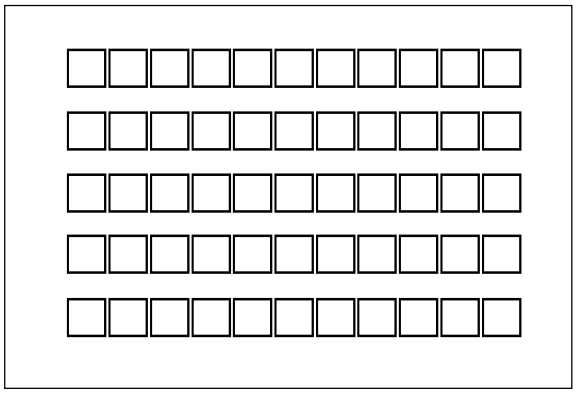
7. Poisoning



8. Snake Bite



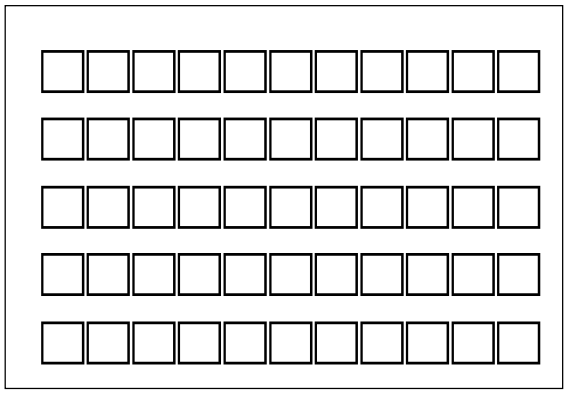
9. Fever



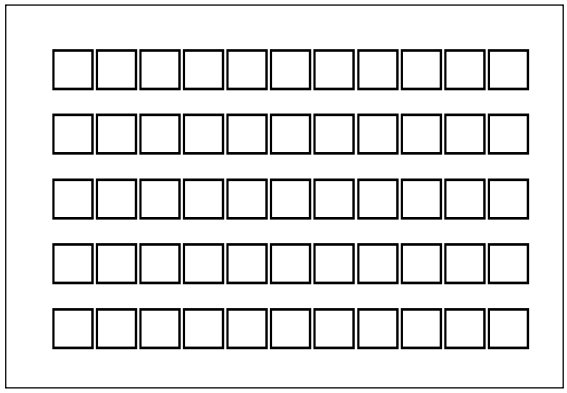
Pediatric Patients

(Please tick one check box for one patient)

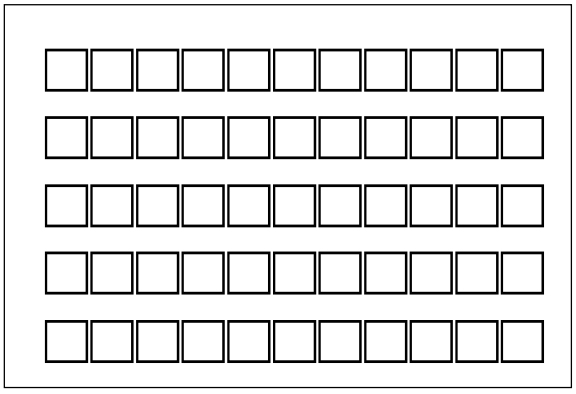
7. Poisoning



8. Snake Bite



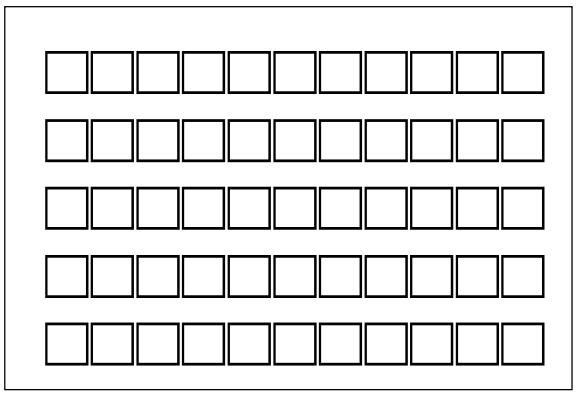
9.Fever



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
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 Department of Emergency Medicine JPN Apex Trauma Centre, AIIMS, New Delhi Email:sanjeevbhoi@gmail.com	**Dr. Praveen Aggarwal** Co-Investigator Department of Emergency Medicine JPN Apex Trauma Centre, AIIMS, New Delhi Email:peekay_124@hotmail.com	**Dr. Tej Prakash Sinha** Co-Investigator 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

ANNEXURE-VI

Overall Summary of Other Specialist / Super Specialist Available in Hospital {Median [IQR] Min-Max} by Category of Hospitals

Department	Designation	Timings	Medical Colleges (N=20)	Govt. Hosp. (>300 bed strength) (N=20)	Govt. Hosp. (<300 bed strength) (N=20)	Pvt. Hosp. (>300 bed strength) (N=20)	Pvt. Hosp. (<300 bed strength) (N=20)
Medicine	Consultant	During OPD Hours only	12 [7] 2-21	4 [2] 1-7	2 [2] 1-8	4.5 [4] 2-11	4 [2] 2-6
		24 x 7 Physically Present	3 [1] 1-3	3 [0] 1-3	2 [1] 1-3	3 [0] 3-5	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 1-3	3 [0] 3-4	3 [0] 3-3	3 [0] 2-3
		Empanelled / As and when required	0	3 [0] 3-3	0	5 [0] 5-5	0
	Resident	During OPD Hours only	14 [18] 4-64	5 [5] 2-15	3 [1] 2-4	10.5 [10.2] 1-15	4.5 [3.5] 1-6
		24 x 7 Physically Present	3 [0] 2-3	3 [1] 1-3	2.5 [0.5] 2-3	3 [0] 3-5	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	0
		Empanelled / As and when required	0	5 [0] 5-5	0	0	0
General Surgery	Consultant	During OPD Hours only	12 [8] 2-24	6 [3] 1-9	2 [2] 1-6	6.5 [5.7] 2-11	3 [2.5] 1-4
		24 x 7 Physically Present	3 [1] 1-3	3 [1] 2-4	3 [0.5] 2-3	3 [0] 3-7	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 1-3	3 [0] 3-3	3 [0] 3-3	3 [0.7] 1-3
		Empanelled / As and when required	0	3 [0] 3-3	0	3 [0] 3-3	0
	Resident	During OPD Hours only	20 [22] 2-53	4 [7] 2-14	2 [2.5] 1-6	14 [5.5] 4-15	3 [1] 2-6
		24 x 7 Physically Present	3 [0] 3-3	3 [1] 1-3	1 [0] 1-1	3 [0] 3-6	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
Pediatrics	Consultant	During OPD Hours only	6 [1] 2-10	3 [4] 1-9	2 [1] 1-6	3 [2.5] 1-7	3 [1] 1-5
		24 x 7 Physically Present	2 [1] 1-3	2 [2] 1-3	2 [0] 2-2	3 [0] 3-7	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [1] 1-3	3 [0] 3-3	3 [0] 3-3	3 [0.5] 1-3
		Empanelled / As and when required	0	3 [0] 3-3	0	2 [0] 2-2	3 [0] 3-3
	Resident	During OPD Hours only	7 [6] 2-20	6 [2.5] 4-9	4 [1.5] 1-4	8.5 [0.5] 8-9	3.5 [0.5] 3-4
		24 x 7 Physically Present	3 [0] 3-3	3 [0.5] 1-3	2 [1] 1-3	3 [0] 3-8	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Gynaecology & Obstetrics	Consultant	During OPD Hours only	8 [10.7] 1-16	3 [2.5] 1-7	2 [1] 1-10	5 [2.7] 1-18	3 [0.7] 3-6
		24 x 7 Physically Present	2 [1] 1-3	3 [0.2] 2-3	3 [0.2] 2-3	3 [0] 3-7	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [1] 1-3	3 [0] 3-7	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	10 [0] 10-10	3 [0] 3-3

	Resident	During OPD Hours only	9 [9.5] 1-33	5 [1.5] 2-8	4 [1] 1-5	10 [4.5] 2-11	3.5 [0.5] 3-4
		24 x 7 Physically Present	3 [0] 3-4	3 [0.5] 2-3	3 [0.5] 2-3	3 [0] 3-10	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	1.5 [0.5] 1-2	3 [0] 3-3	3 [0] 3-3	0
		Empanelled / As and when required	0	0	0	0	0
Orthopedics	**Consultant**	During OPD Hours only	6.5 [6.2] 2-14	3 [4] 1-6	1 [2] 1-5	4.5 [4.2] 1-8	2 [1.5] 1-4
		24 x 7 Physically Present	3 [1] 1-3	3 [0.2] 2-3	2 [1] 1-3	3 [0] 3-9	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [1] 1-3	3 [0] 2-3	3 [0] 3-3	3 [0] 2-3
		Empanelled / As and when required	0	3 [0] 3-3	0	4 [0] 4-4	0
	Resident	During OPD Hours only	3 [11] 1-38	6 [2] 5-9	0	7.5 [1.5] 6-9	2 [1] 1-3
		24 x 7 Physically Present	3 [0] 3-4	3 [1.5] 1-3	1 [0] 1-1	3 [0] 3-5	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	0	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Radiology	**Consultant**	During OPD Hours only	5 [5.2] 1-16	1.5 [1] 1-4	1 [1.5] 1-4	3 [1.5] 1-4	1.5 [1.7] 1-5
		24 x 7 Physically Present	3 [0] 3-3	2 [1] 1-3	3 [0] 3-3	3 [0] 3-4	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0.5] 1-3	2 [1] 1-3	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	0	0
	Resident	During OPD Hours only	7 [9.7] 1-16	2 [0] 2-2	1 [0] 1-1	4 [1] 3-5	6.5 [3.5] 3-10
		24 x 7 Physically Present	3 [0] 3-5	2 [2] 1-3	1 [0] 1-1	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	0	0	3 [0] 3-3	0
		Empanelled / As and when required	0	0	0	0	0
Anesthesia	**Consultant**	During OPD Hours only	11 [9.5] 2-39	4 [5.5] 1-10	2 [2.2] 1-7	7.5 [5.2] 3-23	3 [4.5] 1-11
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 1-4	3 [1] 1-3	3 [0] 3-5	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0.5] 1-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	0	0
	Resident	During OPD Hours only	10 [22.7] 1-45	6.5 [5.5] 2-9	2 [1.5] 1-4	6 [2] 6-10	6.5 [3.5] 3-10
		24 x 7 Physically Present	3 [0] 3-4	3 [1] 1-4	2 [1] 1-3	3 [0] 3-8	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Critical Care	**Consultant**	During OPD Hours only	3 [2.5] 1-6	2.5 [1.5] 1-4	4 [4] 1-7	3 [0] 1-4	3 [3] 1-13
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	3 [0] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [1] 1-3	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
	Resident	During OPD Hours only	3.5 [2.5] 1-6	0	2 [0] 2-2	4.5 [1.5] 3-6	4 [1] 3-5
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	0	0

		Empanelled / As and when required	0	0	0	0	0
Ophthalmology	**Consultant**	During OPD Hours only	3 [3] 1-10	2 [1] 1-5	1 [2.2] 1-5	3 [2.5] 1-5	2 [1.5] 1-6
		24 x 7 Physically Present	3 [0] 3-3	2 [2] 1-3	2.5 [0.5] 2-3	2 [1] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 3-3	3 [0] 3-6	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	4 [0] 4-4	0
	Resident	During OPD Hours only	1 [5.2] 1-22	5 [2] 1-5	0	2 [0] 2-2	2 [0] 2-2
		24 x 7 Physically Present	3 [0] 3-3	3 [0.5] 1-3	1 [0] 1-1	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0.2] 2-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
ENT	**Consultant**	During OPD Hours only	5 [4.2] 1-10	2 [1.5] 1-4	1 [1.5] 1-6	3 [2] 1-6	2 [0.5] 1-3
		24 x 7 Physically Present	3 [0] 3-3	1 [1] 1-3	2 [0] 2-2	3.5 [0.5] 3-4	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 1-3	3 [0] 3-3	3 [0] 3-3	3 [0] 2-3
		Empanelled / As and when required	0	0	0	1 [0] 1-1	0
	Resident	During OPD Hours only	4 [7] 1-23	2 [1.5] 1-4	0	4 [2] 2-6	3 [0] 3-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 1-3	2 [0] 2-2	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0.2] 2-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Psychiatry	**Consultant**	During OPD Hours only	2.5 [3.2] 1-5	2 [0.5] 1-3	1 [0] 1-4	3 (1.5] 1-5	2 [2] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	2 [1] 1, 3	0
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0] 1-3	3 [0] 1-3	3 [0] 3-3	3 [0] 1-3
		Empanelled / As and when required	0	0	0	0	3 [0] 3-3
	Resident	During OPD Hours only	2.5 [3] 1-10	2.5 [0.5] 2-3	0	4.5 [2.5] 2-7	0
		24 x 7 Physically Present	3 [0] 3-3	3 [0.5] 1-3	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0.5] 1-3	2.5 [0.5] 2-3	0	3 [0] 3-3	0
		Empanelled / As and when required	0	0	0	0	0
Dermatology	**Consultant**	During OPD Hours only	3 [5.5] 1-7	2 [1.5] 1-4	1 [0.2] 1-4	2 [0.7] 2-3	3 [1] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [1] 1-3	0	2.5 [0.5] 2-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0] 1-3	3 [0.5] 1-3	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	5 [0] 5-5	0
	Resident	During OPD Hours only	6 [6] 2-14	3.5 [0.5] 3-4	0	2.5 [0.5] 2-3	0
		24 x 7 Physically Present	3 [0] 3-3	3 [1] 1-3	1 [0] 1-1	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0.5] 1-3	2.5 [0.5] 2-3	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Forensic Medicine	**Consultant**	During OPD Hours only	2 [9] 1-10	1 [2] 1-6	1 [0] 1-1	3 [2] 1-4	0
		24 x 7 Physically Present	3 [0] 3-3	3 [1] 1-3	0	3 [0] 3-3	0

		On Call during Non-OPD Hours	3 [0] 1-3	3 [0] 1-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	0	0
	Resident	During OPD Hours only	3.5 [2.5] 1-6	1 [0] 1-1	0	1 [0] 1-1	0
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [1] 1-3	2.5 [0.5] 2-3	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Lab Medicine	**Consultant**	During OPD Hours only	2 [0] 2-2	4 [5.5] 3-25	2 [1] 1-5	3.5 [1.7] 1-11	2 [0] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	2 [1] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 3-3	3 [0.5] 3-4	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	0	0
	Resident	During OPD Hours only	1 [0] 1-1	0	1 [0] 1-1	0	3 [0] 3-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	0	0	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Transfusion Medicine / Blood Bank	**Consultant**	During OPD Hours only	2 [2.2] 1-4	1 [2] 1-4	1 [0.5] 1-5	1 [1.5] 1-4	1 [1] 1-4
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [1.5] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	3 [0] 1-3	0
		Empanelled / As and when required	0	0	0	0	0
	Resident	During OPD Hours only	2.5 [1.5] 1-4	0	1 [0] 1-1	0	3 [0] 3-3
		24 x 7 Physically Present	3 [0] 3-3	0	3 [0] 3-3	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0] 3-3	0	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Cardiology	**Consultant**	During OPD Hours only	2 [3] 1-6	4 [2] 2-6	3 [1] 2-4	3 [2] 1-11	1 [1.5] 1-4
		24 x 7 Physically Present	0	0	0	0	0
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0.5] 1-3	0	3 [0] 3-3	3 [0] 1-3
		Empanelled / As and when required	0	3 [0] 3-3	0	1 [0] 1-1	0
	Resident	During OPD Hours only	6 [0] 6-6	0	0	4 [0] 4-4	3 [0] 3-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [1] 1-3	2.5 [0.5] 2-3	0	0	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
CTVS (Cardiac Surgery)	**Consultant**	During OPD Hours only	2.5 [1.7] 1-5	1 [0] 1-1	1 [0] 1-1	3 [2] 1-6	1.5 [1.2] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	2 [1] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0.5] 1-3	1 [0] 1-1	3 [0] 1-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	0	0
	s i d e	During OPD Hours only	6 [0] 6-6	1 [0] 1-1	0	3 [0] 3-3	3 [0] 3-3

		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [1] 1-3	0	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Neurology	**Consultant**	During OPD Hours only	2.5 [1.5] 1-4	0	1 [0] 1-1	3 [0] 2-3	2 [0.5] 2-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0.2] 3-4	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0.5] 1-3	1 [0] 1-1	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	1 [0] 1-1	3 [0] 3-3
	Resident	During OPD Hours only	3.5 [2.5] 1-6	0	0	4 [0] 4-4	3 [0] 3-3
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [1] 1-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Neurosurgery	**Consultant**	During OPD Hours only	3 [2.2] 2-5	1 [0] 1-1	2 [0] 2-2	3 [1] 2-4	2 [2] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [1] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0.5] 1-3	1 [0] 1-1	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	0	0
	Resident	During OPD Hours only	2.5 [1.2] 1-3	1 [0] 1-1	0	4 [0] 4-4	0
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Plastic Surgery	**Consultant**	During OPD Hours only	3 [2.7] 1-5	1 [0] 1-1	1 [0] 1-1	1 [1] 1-3	2 [1] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	2.5 [0.5] 2-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0.5] 1-3	1 [0] 1-1	3 [0] 3-3	3 [0] 1-3
		Empanelled / As and when required	0	3 [0] 3-3	0	2 [0] 2-2	0
	Resident	During OPD Hours only	2.5 [3] 1-4	1 [0] 1-1	0	0	2.5 [1.5] 1-4
		24 x 7 Physically Present	3 [0] 2-3	3 [0] 3-3	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Maxillofacial Surgery	**Consultant**	During OPD Hours only	1.5 [0.5] 1-2	2 [0] 2-2	1 [0] 1-1	1 [0.5] 1-3	1 [0.2] 1-2
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	1 [0] 1-1	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	2 [1] 1-3	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
	Resident	During OPD Hours only	0	2 [0] 2-2	0	0	0
		24 x 7 Physically Present	3 [0] 3-3	1 [0] 1-1	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	2 [1] 1-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0

Gastroenterology	**Consultant**	During OPD Hours only	1.5 [1.7] 1-5	2 [0] 2-2	2 [0] 2-2	1 [2] 1-4	1 [2] 1-5
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0.5] 3-4	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [1] 1-3	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	4 [0] 4-4	0
	Resident	During OPD Hours only	10 [0] 10-10	2 [0] 2-2	0	1 [0] 1-1	3 [0] 3-3
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	0	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
Nephrology	**Consultant**	During OPD Hours only	1 [1] 1-3	2 [0] 2-2	1 [0] 1-1	2 [2] 1-4	2 [2.5] 1-5
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0.2] 2-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0] 1-3	1 [0] 1-1	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	1 [0] 1-1	0
	Resident	During OPD Hours only	3 [1] 2-4	1 [0] 1-1	0	0	0
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	1 [0] 1-1	0	2 [1] 1-3
		Empanelled / As and when required	0	0	0	0	0
Urology	**Consultant**	During OPD Hours only	3 [2.5] 1-4	1 [0] 1-1	1 [0] 1-1	3 [0.7] 1-3	1 [1] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0.5] 1-3	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	1 [0] 1-1	0
	Resident	During OPD Hours only	3 [3.2] 1-8	1 [0] 1-1	0	0	0
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0] 3-3	3 [0] 3-3	0	0	0
		Empanelled / As and when required	0	2.5 [0.5] 2-3	0	0	0
Neuro Radiology	**Consultant**	During OPD Hours only	0	0	0	2 [1] 1-3	0
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	2 [1] 1-3	1 [0] 1-1	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	3 [0] 3-3	0	0	0
	Resident	During OPD Hours only	0	0	0	0	0
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	0	0	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Pediatric Surgery	**Consultant**	During OPD Hours only	2 [2.2] 1-4	1 [0] 1-1	0	1 [1] 1-3	1 [1] 1, 3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	2 [1] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0.5] 1-3	0	3 [0] 3-3	3 [0] 2-3

		Empanelled / As and when required	0	0	0	1 [0] 1-1	0
	Resident	During OPD Hours only	4.5 [3.5] 1-8	1 [0] 1-1	0	0	0
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0] 3-3	2.5 [0.5] 2-3	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Neonatology	**Consultant**	During OPD Hours only	1.5 [0.5] 1-2	1 [0] 1-1	0	3.5 [1.2] 2-4	1 [0.5] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0.5] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [1] 1-3	3 [0] 3-3	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
	Resident	During OPD Hours only	2 [0] 2-2	0	0	0	0
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	3 [0] 3-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0
Hematology	**Consultant**	During OPD Hours only	3 [0] 3-3	1.5 [0.5] 1-2	0	2.5 [1.7] 1-5	2 [1] 1-3
		24 x 7 Physically Present	3 [0] 3-3	3 [0.5] 2-3	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 3-3	2 [1] 1-3	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
	Resident	During OPD Hours only	4 [0] 4-4	1 [0] 1-1	0	0	0
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	0
		On Call during Non-OPD Hours	0	2 [0] 2-2	0	0	3 [0] 3-3
		Empanelled / As and when required	0	0	0	0	0
Oncology	**Consultant**	During OPD Hours only	1 [0.5] 1-2	0	1 [0] 1-1	2 [2.2] 1-4	1 [3.5] 1-8
		24 x 7 Physically Present	3 [0] 3-3	3 [0] 3-3	0	3 [0.5] 1-3	3 [0] 3-3
		On Call during Non-OPD Hours	3 [0] 1-3	3 [0.5] 1-3	0	3 [0] 3-3	3 [0] 3-3
		Empanelled / As and when required	0	0	0	5 [0] 5-5	0
	Resident	During OPD Hours only	6 [0] 6-6	0	0	0	2 (0) 2, 2
		24 x 7 Physically Present	3 [0] 3-3	0	0	3 [0] 3-3	3 [0] 3-3
		On Call during Non-OPD Hours	2 [1] 1-3	2 [0] 2-2	0	0	0
		Empanelled / As and when required	0	0	0	0	0

ANNEXURE-VII

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69.	Dr Subhankar Paul	Senior Resident, Dept of Emergency Medicine, JPNATC, AIIMS, New Delhi	Delhi	subhankargmch@gmail.com
70.	Dr Sudhanshu	Senior Resident, Emergency, AIIMS, Bhopal	MP	sudhanshu.mgmc@gmail.com

	Agarwal			
71.	Dr Suprith C	Senior Resident, Dept of Emergency Medicine, JPNATC, AIIMS, New Delhi	Delhi	c.suprith@gmail.com
72.	Dr Suvan Kanti Chowdhury	Senior Resident, Dept. of Emergency Medicine, GMCH, Guwahati	Assam	suvanchowdhary@gmail.com
73.	Dr Tanmay Dutta	Associate Professor, Dept of Orthopedics, SSKM Hospital, Calcutta	West Bengal	tanmayortho@yahoo.com
74.	Dr Vignan Kappagantu	Junior Resident, Department of Emergency Medicine, JPNATC, AIIMS, New Delhi	Delhi	vignan_1504@yahoo.co.in
75.	Dr Y. Tato	Assistant Professor and Surgical Specialist, TRIHMS Hospital Naharlagun	Arunachal Pradesh	yijum@yahoo.com
76.	Dr. Bansi Dilipbhai Trambadia	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	bansitrambadia@yahoo.co.in
77.	Dr.Bhumiben Mukeshbhai Patel	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	patelbhumi0703@gmail.com
78.	Dr. Himanshu Rameshchandra Patel	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	Himanshupatel9061@gmail.com
79.	Dr. Hiren Dahyabhai Vaghela	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	hirenvaghela28@gmail.com
80.	Dr. Krunal Kumar Pancholi	Assistant Professor, Dept of Emergency Medicine, SSG Hospital and Medical college, Baroda	Gujarat	krunalpancholi90@gmail.com
81.	Dr. Madhur Uniyal	Assistant Professor, Dept. of Trauma Surgery, AIIMS, Rishikesh	Uttarakhand	drmadhuruniyal@gmail.com
82.	Dr. Malay Mukeshbhai Rathod	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	malayrathod22@gmail.com
83.	Dr. Mihir Haresh kumar Patel	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	mihirpatel1265@gmail.com

84.	Dr. Shivani Patel	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	shivanip4796@gmail.com
85.	Dr. Shreya Rajiv Dholakia	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	shreya.d125@gmail.com
86.	Dr.Sojitra Amit kumar Ramnik bhai	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	amit.sojitra42@gmail.com
87.	Dr.Tapan Jitendra kumar Patel	Intern Doctor, SSG Hospital and Medical college, Baroda	Gujarat	pateltapan2404@gmail.com
88.	Mr A. Ahamed	Tutor, Emergency & Trauma care Technology, SRM Medical College Hospital & Research Centre, Kattankulathur	Tamil Nadu	ahamedkhan108@gmail.com
89.	Mr Arunkumar T A	Nursing officer, Dept of Trauma & Emergency, AIIMS Raipur	Chhattisgarh	arunthekkumkovil@gmail.com
90.	Mr Aswin S Pillai	Nursing officer, Dept of Trauma & Emergency, AIIMS Raipur	Chhattisgarh	aswinspillai009@gmail.com
91.	Mr Bhanwar Lal Dewna	Senior Nursing Officer, Department of Emergency Medicine, AIIMS, Jodhpur	Rajasthan	bldewna@gmail.com
92.	Mr DheeneshbabuLakshminarayanan	Nursing Officer, Department of Emergency Medicine, AIIMS, New Delhi	Delhi	dheeneshbabu@gmail.com
93.	Mr Dinesh Sridhar	Nursing Officer, Department of Emergency Medicine, AIIMS, New Delhi	Delhi	dinodinesh.s1991@gmail.com
94.	Mr J Jayamuruga n	Manager-Clinical Operations, SRM University Hospital, Potheri, Chennai	Tamil Nadu	jay202398@gmail.com
95.	Mr Prakash Mahala	Senior Nursing Officer, Incharge Emergency Medicine, AIIMS, Rishikesh	Uttarakhand	prakashjpmmahala@gmail.com
96.	Mr Rashad	Nursing Officer, WHO CC for Emergency & Trauma Care, SEAR, JPNATC, AIIMS, New Delhi	Delhi	-
97.	Mr Sreekanth Vijayan	Nursing officer, Dept of Trauma & Emergency, AIIMS Raipur	Chhattisgarh	Sreekanthvijayan4@gmail.com

98.	Mr Srinivas SHRI	Nursing Officer, Department of Emergency Medicine, AIIMS, New Delhi	Delhi	mrsuku@gmail.com
99.	Mr Suneesh S	Staff Nurse, General Hospital, Neyyattinkara	Kerala	Email_suneeshbadari@gmail.com
100.	Mr Vikas Choudhary	Nursing Tutor/ ANS, AIIMS, Jodhpur	Rajasthan	vikasss.1988@gmail.com
101.	Mrs Jincy Jose	Nursing officer, Dept of Trauma & Emergency, AIIMS Raipur	Chhattisgarh	Jinjose06@gmail.com
102.	Mrs Pratibha S L	Staff Nurse, Gr1, General Hospital, Neyyattinkara	Kerala	prathibhantanta@gmail.com
103.	Ms Isha Kaushik	Nursing Officer, Department of Emergency Medicine, AIIMS, New Delhi	Delhi	ishukaushik28@gmail.com
104.	Ms Nirmal Thakur	Public Relation Officer, Department of Emergency Medicine, AIIMS, New Delhi	Delhi	Neeru.rjpt.2007@gmail.com
105.	Ms Ramandeep kaur	Nursing Officer, Department of Emergency Medicine, AIIMS, New Delhi	Delhi	bhangoo0073@gmail.com
106.	Ms Roopa Rawat	Nursing Officer, WHO CC for Emergency & Trauma Care, SEAR, JPNATC, AIIMS, New Delhi	Delhi	rooparawat84@gmail.com
107.	Ms Stephy Kennady	Nursing Officer, Dept. of Emergency Medicines, JPNATC, AIIMS, New Delhi	Delhi	stephykennady95@gmail.com
108.	Ms. Varsha Devi	Nursing Officer, Department of pediatrics, AIIMS, New Delhi	Delhi	varshaniepgi@gmail.com
109.	Pulimela Aswan Kumar	Nursing Officer, AIIMS, Raipur	Chhattisgarh	aswansunny239@gmail.com

ANNEXURE-VIII

Contact Details of Hospitals

S. No.	State	Hospital Name	Contact Person	Email ID
1.	Jammu & Kashmir	Sher-i-Kashmir Institute of Medical Sciences, Srinagar		contactus@skims.ac.in
		District Hospital, Barahmulla	Dr B.A.Chalkoo Dr Syed Masood	cmobaramulla123@gmail.com drmasood3788@gmail.com
		District Hospital, Ganderbal		msdhganderbal@gmail.com
2.	Himachal Pradesh **Dr A K Gupta (DHS)-** 9418015368 **Dr Ravi Chand (DME)-** 9418028446	IGMC, Shimla	Dr Mukand Lal (Principal)	principal-igmc-hp@gov.in
		District Hospital, Shimla	Dr Ganga Sharma	dirhealthdhs@gmail.com(DHS) dr.ravicsharma@gmail.com(DME)
3.	Punjab	Govt. Medical College, Amritsar	Dr Shiv Charan	sgtbasr@gmail.com, drsharma1947@yahoo.com
		Jallianwala Bagh Martyr's Memorial Civil Hospital, Rambagh, Amritsar	Dr Varun Joshi (Admin)	-
		Fortis Hospital, Mohali	Dr Sunil	bhavna.ahuja@fortishealthcare.com
		Shivam Multi Super Speciality Hospital, Hoshiarpur	Navtej Bassa	navtej.bassan@gmail.com
4.	Uttarakhand	HNB Base Hospital	01346 244706 Sandeep (AO)	medicalsuprintendent@gmail.com principalvcsg@gmail.com
		Coronation Hospital, Dehradun	Dr S K Gupta (CMO) Dr Ramola (CMS)	cmodehradun@gmail.com coronationhosp@gmail.com
5.	Uttar Pradesh	Civil Hospital, Lucknow	Dr Ashok Kumar Singh (CMO)	-
		RML Hospital, Lucknow	Dr A S Tripathi (Q/A) Admin Block	director@drrmlims.ac.in, directordrrmlims@gmail.com
		Charak Hospital, Lucknow	Manik Kumar Saxena	-

6.	Chandigarh	Government Superspeciality Hospital	Dr Satbir	-
		Civil Hospital, Sec-22	Dr Mandeep	-
		Max Superspeciality Hospital	Lalit Kumar Sharma	-
7.	Rajasthan	SMS Medical College & Hospital	Dr Sudhir Bhandari (Principal) Dr D S Meena (MS)	principalsmsmc@rajasthan.gov.in
		Hari Baksh Kanwatia Hospital, Jaipur	Dr Harashwardhan (MS)	sahai.dr@gmail.com
		District Hospital, Kothputli	Dr. Rati Ram Yadav (PMO)	bdm.hospitalkotputli@gmail.com
		Fortis Hospital, Jaipur	Dr. Shri Kant Swami (MS)	shrikant.swami@fortishealthcare.com
		Birla Hospital- CK Birla, Jaipur	Dr. Ajeet Singh (Senior Consultant in EM)	ajeet.singh@rbhri.in
8.	Gujarat	B J Medical College, Vadodara		dean-bjmc-ahm@gujarat.gov.in dean.bjmc@hotmail.com drmmprabhakar@gmail.com
		GMERS Medical College and Hospital, Gotri		deanmcgv@gmail.com dean@gmersmcgv.ac.in
		Jamanabai Hospital		cdmo.health.jamnabai@gmail.com
		ParulSevashram Hospital, Vadodara		psh@paruluniversity.ac.in parulsevashram@gmail.com medical@paruluniversity.ac.in
		Bhailal Amin General Hospital, Vadodara		contact@baghospital.com
9.	Maharashtra	BJ Medical College, Pune	Dr. Satyanarayan- **(MS)**	drajaytaware@yahoo.com sbpunpale@gmail.com
		Sri Seva Medical foundation Dr Jogalekar Hospital, Shirwal, Pune	-	drom2002@gmail.com
		Grant Medical Foundation Ruby Hall Clinic, Pune	-	drspathare@rubyhall.com
10.	Madhya Pradesh	AIIMS, Bhopal	-	-
		Jai Prakash District Hospital, Bhopal	-	cmhobho@nic.in
		Bhopal fracture hospital, Bhopal	-	rabbina.tamu@gmail.com kamleshvarma@hotmail.com
11.	Chhattisgarh	District Hospital, Tikarpara, Raipur	Dr. Ravi Tiwari	-
		District Hospital, Dhamtari	Dr. P.C. Thakur	csdhamtari2012@gmail.com
		Ramkrishna CARE	Dr. Sujoy Das Thakur	dr.tanushree.sidharth@carehospitals.com

		Hospital, Pachpedhi	(HOD)	
12.	Goa	Goa Medical College, Panaji	Dr Rajesh Patil Dr. S M Bandekar (Dean)	dean_gmc.goa@nic.in msgmcgoa@gmail.com
		North Goa District Hospital, Mapusa	Shailendra Munz Dr. Geeta Kakodkar (MS)	-
13.	Bihar	PMCH, Patna	-	principalsoffice@rediffmail.com info@patnamedicalcollege.com
		AIIMS, Patna	-	admin@aiimspatna.org
		Sadar Hospital, Gaya	-	-
		Paras HMRI Hospital, Patna	-	infopat@parashospitals.com
		Ruban Memorial Hospital, Patliputra		
14.	Orissa	AIIMS, Bhubneshwar		info@aiimsbhubaneswar.edu.in
		District Headquarter Hospital, Puri	Dr. Narahari Moharana (CMO)	-
		Capital Hospital, Bhubneshwar	Dr Ashok K Pattnaik (Director) Dr Narayan Sethi- (MS)	info@capitalhospital.in
		Care Hospital, Bhubneshwar	-	leads.BBSR@carehospitals.com
15.	West Bengal	IPGMER, SSKM Hospital, Kolkata	Dr Manimoy Bandopadhyay (Director)	director.ipgmer@gmail.com
		Ruby General Hospital, Kolkata	Dr Sujoy Ranjan	ruby@rubyhospital.com
16.	Sikkim	New STNM, Arithang, Gangtok, Sikkim	Dr N Senga	-
		Singtam District Hospital, Sikkim	-	-
		Central Referral Hospital, Gangtok	Bunty Agarwal (Admin)	-
17.	Arunachal Pradesh	TRIHMS, Papumpare		trihmsap@gmail.com
		Bakin Pertin General Hospital, Pasighat	Dr Y Darang	-
		Ramakrishanan Mission Hospital, Itanagar	-	rkmitanagar@gmail.com itanagar@rkmm.org
18.	Assam	Gauhati Medical College and Hospital, Guwahati	-	superintendentgmch@gmail.com
		Morigaon Civil	-	jtdhsmorigaon2017@gmail.com

		hospital, Guwahati		
		GNRC Hospital, Guwahati	-	info@gnrchospitals.com
		Nemcare Superspecialty Hospital, Guwahati	-	info@nemcarehospital.in
19.	Meghalaya	Civil Hospital Shillong, Meghalaya	-	dc-ekh-meg@nic.in
20.	Nagaland	District Hospital, Peren, Nagaland	Dr Hatlhing Hangsing	-
		Christian Institute of Health Science and Research	Dr Clement	-
21.	Manipur	RIMS, Imphal	-	dean@rims.edu.in drsanta@rediffmail.com
		District Hospital, Bishnupur	-	-
		Shija Hospital & Research Institute, Meitei longol, Imphal	-	contact@shijahospitals.com
22.	Tripura	Agartala Government Medical College	Dr Sukomal Sarkar	agmc@rediffmail.com principalagmc@gmail.com msagmcgbph@gmail.com
		Gomti District Hospital, Udaipur	-	-
		Tripura medical college& BRAM Teaching Hospital, Agartala	Dr Anarsh	tmc.agt@gmail.com
23.	Mizoram	Zoram Medical College	Dr Debbie	director@mimerfalkawn.edu.in
		Civil Hospital, Aizawl	Dr John Zohmingthanga	-
		Synod Hospital (Presbyterian Hospital)	Dr Zothua	preshospital_durtlang@rediffmail.com presdrt05@bsnl.in
24.	Telangana	District Hospital, Karim Nagar	-	disthospitalkarimnagar@gmail.com
		District Hospital, King Koti, Hyderabad	-	-
		Yashoda Hospital, Malakpet, Hyderabad	Dr Ajith Singh (Medical Admin)	dr.ajithsingh@yashodamail.com
25.	Karnataka	Mysore Medical College, Mysore	-	-
		Victoria Hospital, Bengaluru	-	victoriahospitalbangalore@ymail.com msvh1900@gmail.com
		Govt. Taluk Hospital, Virajapet	-	amovirajpetgh@gmail.com
		Manipal Hospital	-	info@manipalhospitals.com
26.		Guntur Medical	-	gmc_gtr@ap.nic.in

	Andhra Pradesh	College, Guntur		
		District Hospital Tenali	-	-
		Kasturi Medical College & Hospital	-	kmchgnt@gmail.com
		Lalitha Super Specialty Hospital, Kothapet, Guntur	-	lalithahospitals@gmail.com
27.	Kerala	Trivandrum medical college	Dr Thomas Mathew (Principal) Dr Sharmath (MS)	principalmct@gmail.com, supdt.mcht@gmail.com
		Neyyatinkara General Hospital	-	dhneyyattinkara@gmail.com
		District Model Hopital, Perooraada, Trivantapuram	-	dmhperoorkkada@gmail.com dhskerala.hlth@kerala.gov.in**(DHS)**
		Cosmopolitan Hospital, Trivandrum	Ashok P Menon (CEO)	ceo@cosmopolitanhospitals.in coo@cosmopolitanhospitals.in
		G G Hospital, Trivandrum	-	phkplgghospital@gmail.com
28.	Tamil Nadu	Madras Medical college	Dr R Jayanthi (Dean) Dr Narayanasamy- (MS)	deanmmc@tn.gov.in , gghdean@gmail.com
		Southern Railway Headquarters Hospital	Dr Nirmala (Medical Director)	nirmala.deviv1959@gmail.com mdrhper@sr.railnet.gov
		Apollo Hospital, Greams Road, Chennai	-	info@apollohospitals.com
29.	Pondicherry	JIPMER Pondicherry	Dr Rakesh Aggarwal (Director)	director@jipmer.edu.in, ashok1956badhe@gmail.com
		Indira Gandhi Government General Hospital, Pondicherry	Vizeacoumary (Deputy Director) Dr Simon (HOD)	vizeacoumary@gmail.com
30.	Delhi	Primus Super Speciality Hospital, Chanakyapuri	Dr Subrata Gorai (MS)	casualty@primushospital.com ms@primushospital.com
		Medeor Hospital, Manesar	Mr Shastry	vgr.shastry@medeor.in
		Yashoda Hospital, Kaushambi	Dr Anuj (MS)	dranujagarwal@rediffmail.com
		Indian Spinal Injury Centre	Dr H S Chhabra (Medical Director)	cma@isiconline.org drhschhabra@isiconline.org
		Asian Hospital	Dr Hilal Ahmed (Director)	hilal.ahmed@aimsindia.com
		Sri Ganga Ram Hospital	Dr Reena Kumar (Addl Director Medical)	dr.reena.kr@gmail.com

			Dr Sucheta (ED Head)	
		Artemis Hospital	Dr Sumit Ray (Chief of Medical Services)	sumit.ray@artemishospitals.com
		Jaipur Golden Hospital	-	drnishithmittal@yahoo.co.in

ANNEXURE-IX

Comparative of Compliance among Medical College

S. No	Name of Hospitals	Hospital Services	ED Protocol/ SOP/ Guidelines	Safety & Security	Disaster management	Continuous Quality Management	Data Management System	Financing	Physical Infrastructure	Equipment & Supplies in ED	Essential medicine in ED	Overall Compliance
1	**Civil Hospital, Ahemdabad**	66%	21%	94%	67%	71%	50%	75%	56%	92%	88%	**68%**
2	**Agartala Government Medical College & G B Pant Hospital**	41%	17%	39%	0%	21%	39%	38%	76%	23%	67%	**36%**
3	**Guru Nanak Dev Hospital, GMC, Amritsar, Punjab**	45%	13%	28%	0%	7%	0%	38%	78%	30%	16%	**26%**
4	**Tomo Riba Institute if Health & Medical Sciences, Papumpare**	22%	0%	56%	0%	14%	17%	38%	56%	36%	35%	**27%**
5	**B J Medical College & Sassoon General Hospital, Pune**	57%	13%	72%	0%	7%	28%	50%	88%	56%	63%	**43%**
6	**Sher - I - Kashmir Institute of Medical Sciences, Srinagar**	57%	21%	56%	42%	50%	22%	38%	61%	63%	51%	**46%**
7	**Regional Institute of Medical Sciences, Imphal**	48%	13%	83%	25%	29%	28%	63%	92%	35%	43%	**46%**
8	**Gauhati medical College & Hospital**	62%	29%	50%	33%	43%	50%	38%	78%	60%	62%	**51%**
9	**Mysore Medical College & Krishna Rajendra Hospital**	40%	0%	33%	0%	7%	39%	0%	51%	34%	58%	**26%**
10	**New STNM Hospital**	36%	0%	50%	0%	29%	44%	38%	47%	55%	77%	**38%**
11	**Government General Hospital, Guntur**	52%	17%	44%	0%	14%	33%	13%	58%	55%	77%	**36%**
12	**SMS Medical College & Hospital**	74%	13%	50%	42%	0%	39%	38%	69%	88%	91%	**50%**
13	**Goa Medical College**	72%	25%	83%	17%	57%	44%	25%	81%	49%	78%	**53%**
14	**AIIMS, Bhopal**	53%	25%	89%	17%	7%	89%	50%	44%	100%	100%	**57%**
15	**Rajiv Gandhi Government General Hospital, Madras Medical College**	69%	46%	100%	75%	79%	44%	75%	93%	82%	95%	**76%**
16	**JIPMER, Pondicherry**	72%	33%	89%	67%	86%	78%	25%	69%	70%	83%	**67%**
17	**Government Medical College, Thiruvananthapuram**	57%	33%	78%	42%	43%	17%	75%	67%	80%	100%	**59%**
18	**Patna Medical College & Hospital**	36%	8%	22%	8%	29%	6%	38%	92%	59%	89%	**39%**
19	**IPGMER & SSKM Hospital**	91%	100%	89%	67%	86%	83%	38%	81%	92%	98%	**83%**
20	**IGMC, Shimla**	60%	4%	78%	8%	21%	6%	38%	71%	72%	87%	**45%**

Comparative of Compliance among Government Hospitals more than 300 beds

S. No	Name of Hospitals	Hospital Services	ED Protocol/ SOP/ Guidelines	Safety & Security	Disaster management	Continuous Quality Management	Data Management System	Financing	Physical Infrastructure	Equipment & Supplies in ED	Essential medicine in ED	Overall Compliance
1	**GMERS Medical College & Hospital**	48%	29%	56%	50%	14%	33%	0%	88%	72%	79%	**47%**
2	**Civil Hospital, Shillong**	21%	50%	78%	67%	29%	22%	0%	72%	58%	26%	**42%**
3	**Jallianwala Bagh Matyr Memorial Hospital, Amritsar**	31%	29%	78%	42%	79%	0%	38%	57%	41%	53%	**45%**
4	**Zoram Medical College**	21%	4%	22%	0%	0%	0%	13%	55%	52%	53%	**22%**
5	**District Hospital, Baramulla, Jammu & Kashmir**	47%	71%	100%	92%	100%	72%	38%	74%	53%	74%	**72%**
6	**Victoria Hospital, Bangalore**	66%	4%	33%	8%	29%	39%	25%	76%	44%	59%	**38%**
7	**District Hospital, Karim Nagar**	43%	21%	0%	0%	0%	0%	63%	67%	27%	56%	**28%**
8	**Government District Hospital, Tenali**	50%	50%	56%	17%	21%	39%	63%	85%	48%	80%	**51%**
9	**Hari Baksh Kanwatia Hospital**	19%	0%	28%	8%	7%	17%	50%	68%	34%	67%	**30%**
10	**Dr Shyam Prasad Mukharji Civil Hospital, Lucknow**	38%	29%	72%	50%	71%	50%	25%	64%	33%	78%	**51%**
11	**Government Multispeciality Hospital, Sector 16**	28%	58%	100%	100%	93%	50%	25%	82%	49%	61%	**65%**
12	**Jai Prakash Narayan District Hospital, Bhopal**	26%	29%	72%	67%	7%	56%	75%	65%	60%	87%	**54%**
13	**Southern Railways Hospital, Chennai**	52%	38%	61%	83%	21%	61%	38%	60%	58%	69%	**54%**
14	**AIIMS, Bhubneswar**	41%	33%	67%	0%	36%	50%	75%	90%	71%	61%	**52%**
15	**Indira Gandhi Government General Hospital, Pondicherry**	48%	0%	33%	17%	21%	33%	50%	65%	49%	88%	**40%**
16	**AIIMS, Patna**	62%	25%	67%	17%	57%	83%	0%	66%	94%	94%	**57%**
17	**General Hospital, Neyyatinkara**	19%	8%	22%	17%	29%	11%	38%	72%	45%	65%	**33%**
18	**District Hospital, Dhamtari**	26%	21%	39%	17%	7%	28%	0%	67%	40%	60%	**31%**
19	**HNB Base Hospital**	33%	21%	39%	42%	36%	44%	0%	75%	76%	73%	**44%**
20	**Deen Dayal Upadhyay Hospital**	17%	8%	78%	42%	79%	61%	25%	66%	58%	79%	**51%**

Comparative of Compliance among Government Hospitals less than 300 beds

S. No	Name of Hospitals	Hospital Services	ED Protocol/ SOP/ Guidelines	Safety & Security	Disaster management	Continuous Quality Management	Data Management System	Financing	Physical Infrastructure	Equipment & Supplies in ED	Essential medicine in ED	Overall Compliance
1	**Jamanabai General Hospital**	21%	38%	44%	0%	36%	28%	63%	81%	37%	72%	**42%**
2	**Gomti District Hospital**	26%	8%	61%	8%	14%	28%	50%	60%	32%	62%	**35%**
3	**District Hospital, Peren, Nagaland**	7%	17%	28%	0%	14%	0%	50%	83%	27%	16%	**24%**
4	**Civil Hospital, Aizawl, Mizoram**	28%	54%	83%	67%	86%	39%	75%	61%	57%	62%	**61%**
5	**District Hospital, Pasighat**	33%	21%	56%	8%	43%	17%	38%	53%	31%	56%	**36%**
6	**Dr Jogalekar Hospital**	38%	83%	67%	83%	86%	78%	0%	86%	94%	50%	**67%**
7	**District Hospital, Ganderbal**	17%	25%	67%	33%	36%	28%	38%	85%	55%	82%	**47%**
8	**District Hospital, Bishnupur, Manipur**	10%	8%	22%	25%	21%	11%	63%	63%	24%	50%	**30%**
9	**Morigaon Civil Hospital, Assam**	14%	8%	33%	25%	0%	39%	0%	69%	33%	63%	**28%**
10	**Government Hospital Virajpet**	33%	4%	28%	8%	29%	0%	25%	57%	43%	70%	**30%**
11	**District Hospital, Singtam**	28%	21%	56%	17%	71%	0%	25%	76%	53%	66%	**41%**
12	**District Hospital, King Koti**	41%	13%	50%	0%	43%	44%	0%	73%	70%	57%	**39%**
13	**Govt. BDM Hospital, Kotputli**	28%	17%	22%	8%	21%	0%	38%	74%	37%	29%	**27%**
14	**North Goa District Hospital**	31%	21%	83%	8%	79%	33%	0%	60%	51%	83%	**45%**
15	**Civil Hospital, Sector 22**	7%	13%	67%	50%	21%	0%	38%	81%	53%	49%	**38%**
16	**Puri District Headquarter Hospital, Orissa**	34%	0%	72%	50%	43%	56%	63%	69%	61%	55%	**50%**
17	**Sadar Hospital, Gaya**	9%	0%	17%	0%	14%	0%	0%	44%	27%	40%	**15%**
18	**District Hospital, Peroorkada**	21%	8%	28%	0%	21%	33%	0%	73%	42%	53%	**28%**
19	**District Hospital, Raipur**	21%	38%	72%	33%	21%	0%	0%	76%	41%	59%	**36%**
20	**Coronation Hospital, Dehradun**	14%	21%	22%	58%	7%	6%	63%	58%	31%	68%	**35%**

Comparative of Compliance among Private Hospitals more than 300 beds

S. No	Name of Hospitals	Hospital Services	ED Protocol/ SOP/ Guidelines	Safety & Security	Disaster management	Continuous Quality Management	Data Management System	Financing	Physical Infrastructure	Equipment & Supplies in ED	Essential medicine in ED	Overall Compliance
1	**Parul Sewasharam Hospital**	52%	13%	78%	42%	50%	44%	0%	87%	90%	92%	**55%**
2	**Tripura Medical College & BRAM Teaching Hospital**	52%	21%	78%	50%	79%	39%	25%	76%	37%	76%	**53%**
3	**Synod Hospital, Aizawl, Mizoram**	38%	13%	50%	0%	7%	33%	0%	91%	88%	83%	**40%**
4	**Grant Medical Foundation Ruby Hall Clinic**	91%	100%	89%	92%	93%	89%	0%	89%	90%	100%	**83%**
5	**GNRC, Guwahati, Assam**	40%	21%	61%	50%	57%	33%	0%	91%	42%	54%	**45%**
6	**Manipal Hospital, Bangaluru**	86%	83%	89%	67%	100%	56%	0%	96%	88%	70%	**74%**
7	**Central Referral Hospital, Sikkim**	62%	8%	67%	8%	71%	44%	13%	87%	72%	94%	**53%**
8	**Kasturi Medical College & Hospital**	59%	38%	78%	17%	57%	44%	0%	89%	66%	100%	**55%**
9	**Fortis Hospital, Jaipur**	33%	92%	100%	83%	100%	94%	0%	84%	100%	100%	**79%**
10	**Dr Ram Manohar Lohia Hospital**	45%	38%	100%	67%	86%	44%	25%	63%	58%	67%	**59%**
11	**Fortis Hospital, Punjab**	86%	92%	89%	100%	86%	50%	0%	70%	76%	98%	**75%**
12	**Apollo Hospitals, Chennai**	76%	96%	94%	100%	100%	94%	0%	72%	85%	87%	**80%**
13	**Capital Hospital, Orissa**	52%	54%	72%	92%	43%	83%	38%	94%	65%	80%	**67%**
14	**Yashoda Hospital, Malakpet**	83%	83%	89%	67%	100%	83%	0%	79%	100%	89%	**77%**
15	**Paras HMRI Hospital**	41%	96%	89%	100%	100%	67%	0%	93%	92%	97%	**78%**
16	**Cosmopolitan Hospitals Privatre Limited**	76%	38%	78%	25%	79%	56%	0%	85%	89%	91%	**62%**
17	**Yashoda Hospital, Kaushambi**	66%	75%	83%	75%	64%	67%	0%	76%	79%	91%	**68%**
18	**Asian Hospital**	88%	67%	94%	92%	93%	100%	0%	87%	96%	84%	**80%**
19	**Sri Ganga Ram Hospital**	84%	100%	89%	100%	93%	67%	0%	93%	94%	81%	**80%**
20	**Artemis Hospital**	84%	92%	89%	83%	100%	78%	0%	75%	94%	92%	**79%**

Comparative of Compliance among Private Hospitals less than 300 beds

S. No	Name of Hospitals	Hospital Services	ED Protocol/ SOP/ Guidelines	Safety & Security	Disaster management	Continuous Quality Management	Data Management System	Financing	Physical Infrastructure	Equipment & Supplies in ED	Essential medicine in ED	Overall Compliance
1	**Bhailal Amin General Hospital**	74%	63%	89%	83%	93%	72%	0%	92%	78%	98%	**74%**
2	**Christian Institute of Health Sciences & Research, Dimapur**	21%	33%	61%	25%	93%	56%	0%	84%	67%	77%	**52%**
3	**Shivam Hospital, Hoshiarpur, Punjab**	50%	38%	83%	17%	93%	44%	13%	86%	61%	66%	**55%**
4	**Ramakrishna Mission Hospital, Arunachal Pradesh**	43%	46%	78%	42%	86%	44%	0%	84%	78%	97%	**60%**
5	**Shija Hospital & Research Institute, Meitei longol, Imphal**	62%	42%	72%	33%	79%	33%	25%	85%	22%	71%	**52%**
6	**Nemcare Superspeciality Hospital, Assam**	79%	67%	89%	50%	36%	56%	50%	89%	80%	85%	**68%**
7	**Lalitha Super Speciality Private Hospital**	55%	75%	83%	25%	86%	89%	25%	88%	67%	94%	**69%**
8	**Birla CK Hospital, Jaipur**	41%	75%	78%	58%	79%	78%	0%	84%	100%	100%	**69%**
9	**Charak Hospital & Research Centre, Lucknow**	59%	67%	94%	83%	93%	50%	0%	73%	98%	98%	**72%**
10	**Max Super Speciality Hospital**	86%	75%	89%	50%	100%	56%	13%	84%	92%	96%	**74%**
11	**Bhopal Fracture Hospital, Bhopal**	26%	67%	78%	17%	57%	67%	38%	97%	96%	68%	**61%**
12	**Care Hospital, Orissa**	69%	79%	89%	75%	100%	78%	0%	82%	73%	93%	**74%**
13	**G G Hospital**	62%	83%	89%	67%	79%	67%	0%	77%	82%	93%	**70%**
14	**Ruban Memorial Hospital**	57%	88%	89%	50%	79%	100%	0%	77%	99%	100%	**74%**
15	**Ramakrishna Care Hospital**	93%	75%	89%	100%	100%	94%	100%	80%	100%	100%	**93%**
16	**Ruby General Hospital**	53%	63%	78%	42%	79%	72%	25%	92%	76%	83%	**66%**
17	**Indian Spinal Injuries Centre**	62%	67%	89%	83%	93%	72%	0%	78%	90%	86%	**72%**
18	**Medeor Hospital**	76%	92%	89%	100%	100%	56%	0%	67%	88%	74%	**74%**
19	**Jaipur Golden Hospital**	74%	71%	83%	92%	86%	50%	0%	84%	83%	79%	**70%**
20	**Primus Super Speciality Hospital**	100%	100%	100%	75%	86%	100%	100%	72%	92%	100%	**93%**

Master Sheet depicting Compliance among Hospital Categories

S.No.	Area of Concern	Medical College	Government Hospitals more than 300 beds	Government Hospitals less than 300 beds	Private Hospitals more than 300 beds	Private Hospitals less than 300 beds	Overall Compliance
1	**Hospital Services**	56%	37%	23%	65%	62%	**49%**
2	**ED Protocol/ SOP/ Guidelines**	22%	26%	21%	61%	68%	**40%**
3	**Safety & Security**	64%	55%	49%	83%	84%	**67%**
4	**Disaster management**	26%	37%	24%	66%	58%	**42%**
5	**Continuous Quality Management**	35%	37%	35%	78%	85%	**54%**
6	**Data Management System**	38%	37%	22%	63%	67%	**45%**
7	**Financing**	42%	32%	31%	5%	19%	**26%**
8	**Physical Infrastructure**	70%	71%	69%	84%	83%	**75%**
9	**Equipment & Supplies in ED**	62%	53%	45%	80%	81%	**64%**
10	**Essential medicine in ED**	73%	68%	57%	86%	88%	**74%**

Master Sheet depicting Overall Compliance of individual Hospital among all Categories

Zone	S. No.	State	Medical College	Government Hospital (more than 300 beds)	Government Hospital (less than 300 beds)	Private Hospital (more than 300 beds)	Private Hospital (less than 300 beds)
NORTH ZONE	1	Jammu & Kashmir	Sher-i-Kashmir Institute of Medical Sciences, Srinagar **(46%)**	District Hospital Hospital, Barahmulla, Jammu & Kashmir **(72%)**	District Hospital Ganderbal, Ganderbal **(47%)**	-	-
	2	Himachal Pradesh	IGMC, Shimla **(45%)**	District Hospital,Shimla (Deen Dayal Upadhyay Hospital) **(51%)**	-	-	-
	3	Punjab	Guru Nanak Dev Hospital & Govt. Medical College, Amritsar **(26%)**	Jallianwala Bagh Martyr's Memorial Civil Hospital, Rambagh, Amritsar **(45%)**	-	Fortis Hospital, Mohali **(75%)**	Shivam Multi Super Speciality Hospital, Hoshiarpur **(55%)**
	4	Haryana	-	-	-	-	-
	5	Uttarakhand	-	HNB Base Hospital **(44%)**	Coronation Hospital, Dehradun **(35%)**	-	-
	6	Utttar Pradesh	-	Civil Hospital- Lucknow **(51%)**	-	RML Hospital, Lucknow **(59%)**	Charak Hospital Hardoi road, near Safed Masjid, Dubagga **(72%)**
	7	Chandigarh	-	Government Superspeciality Hospital, Sector-16 **(65%)**	Civil Hospital Sector-22, Chandigarh **(38%)**	-	Max Superspeciality Hospital, Mohali **(74%)**
	8	Rajasthan	SMS Medical College & Hospital, Jaipur **(50%)**	Hari Baksh Kanwatia Hospital, Shastri Nagar, Jaipur **(30%)**	Govt. BDM Hospital, Kotputli, Rajasthan **(27%)**	Fortis Hospital, Jaipur **(79%)**	Birla Hospital- CK Birla, Shanthi Nagar, Jaipur **(69%)**
	9	Delhi	-	-	-	Yashoda Hospital, Kaushambi **(68%)**	Indian Spinal Injuries Centre **(72%)**
						Asian Hospital **(80%)**	Medeor Hospital, Manesar **(74%)**
						Sri Ganga Ram Hospital **(80%)**	Jaipur Golden Hospital **(70%)**
						Artemis Hospital **(79%)**	Primus Super Speciality Hospital **(93%)**

WEST ZONE	1	Gujarat	BJ Medical College & Civil Hospital, Ahemdabad **(68%)**	GMERS Medical College & Hospital, Gotri, Vadodara **(47%)**	Jamanabai Government Hospital, Mandvi **(42%)**	Parul Sewasharam Hospital, Vadodara **(55%)**	Bhailal Amin General Hospital, Vadodara **(74%)**
	2	Maharashtra	BJ Medical College & Sassoon General Hospital, Pune **(43%)**	-	Sri Seva Medical foundation Dr Jogalekar Hospital, Shirwal, Pune **(67%)**	Grant Medical Foundation Ruby Hall Clinic, Pune **(83%)**	-
	3	Madhya Pradesh	AIIMS, Bhopal **(57%)**	Jai Prakash District Hospital, Shivaji Nagar, Bhopal **(54%)**	-	-	Bhopal Fracture Hospital, Bhopal **(61%)**
	4	Chhattisgarh	-	District Hospital, Dhamtari, Chhattisgarh **(31%)**	District Hospital, Tikarpara, Raipur, Chhattisgarh **(36%)**	-	Ramkrishna CARE Hospital **(93%)**
	5	Goa	Goa Medical College, Panaji **(53%)**	-	North Goa District Hospital, Mapusa **(45%)**	-	-
EAST ZONE	1	Bihar	PMCH, Patna **(39%)**	AIIMS Patna **(57%)**	Sadar Hospital, Gaya **(15%)**	Paras HMRI Hospital, Patna **(78%)**	Ruban Memorial hospital patliputra **(74%)**
	3	Orissa	-	AIIMS, Bhubneshwar **(52%)**	District Headquarter Hospital, Puri **(50%)**	Capital Hospital, Bhubneshwar **(67%)**	Care Hospital, Bhubneshwar **(74%)**
	4	West Bengal	IPGMER & SSKM **(83%)**	-	-	-	Ruby General Hospital **(66%)**
NORTH EAST ZONE	1	Sikkim	New STNM- Govt- medical college, Sikkim **(38%)**	-	Singtam District Hospital **(41%)**	Central Referral hospital, Gangtok **(53%)**	-
	2	Arunachal Pradesh	Tomo Riba Institute of Health & Medical Sciences, Papumpare **(27%)**	-	Bakin Pertin General Hospital, Medog, Pasighat **(36%)**	-	Ramakrishna Mission Hospital, Itanagar **(60%)**
	3	Assam	Gauhati Medical College and Hospital, Guwahati **(51%)**	-	Morigaon Civil Hospital **(28%)**	GNRC Hospital, Guwahati **(45%)**	Nemcare Superspecialty Hospital, Guwahati **(68%)**
	4	Meghalaya	-	Civil Hospital Shillong, Meghalaya **(42%)**	-	-	-
	5	Nagaland	-	-	District Hospital, Peren, Nagaland **(24%)**	-	Christian Institute of Health Science and Research **(52%)**

	6	Manipur	RIMS, Imphal **(46%)**	-	District Hospital, Bishnupur **(30%)**	-	Shija Hospital & Research Institute, Imphal **(52%)**
	7	Tripura	Agartala Government Medical College & G B Pant Hospital **(36%)**	-	Gomti District Hospital, Udaipur **(35%)**	Tripura medical college& BRAM Teaching Hospital, Agartala **(53%)**	-
	8	Mizoram	-	Zoram Medical College **(22%)**	Civil Hospital, Aizawl **(61%)**	Synod Hospital **(40%)**	-
SOUTH ZONE	1	Telangana	-	District Hospital, Karim Nagar, Hyderabad **(28%)**	District Hospital, King Koti, Hyderabad **(39%)**	Yashoda Hospital, Malakpet, Hyderabad **(77%)**	-
	2	Karnataka	Mysore Medical College & Krishna Rajendra Hospital, Mysuru **(26%)**	Victoria Hospital, Bengaluru **(38%)**	Government Hospital, Virajpet **(30%)**	Manipal Hospital, Bengaluru **(74%)**	-
	3	Andhra Pradesh	Guntur Medical college & Government General Hospital **(36%)**	Government District Hospital, Tenali **(51%)**	-	Kasturi Medical College & Hospital **(55%)**	Lalitha Super Specialty Hospital, Kothapet, Guntur **(69%)**
	4	Kerala	Trivandrum Govt Mediacl College **(59%)**	District Hospital, Neyyattinkara **(33%)**	District Hospital, Peroorkada **(28%)**	Cosmopolitan Hospitals Pvt Ltd **(62%)**	G G Hospital **(70%)**
	5	Tamil Nadu	Madras Medical College **(76%)**	Madras Railway Hospital, Madras (Southern Railway Headquarters Hospital) **(54%)**	-	Apollo Hospital **(80%)**	-
	6	Pondicherry	JIPMER, Pondicherry **(67%)**	Indira Gandhi Government General Hospital, Pondicherry **(40%)**	-	-	-