

**Analysis of the Un-availed Dispatch and Vehicle Busy cases in
Andhra Pradesh and scope for its improvement**

**Internship Training
at**



GVK Emergency Management and Research Institute

**By
Aleti goutham**

**Under the Guidance of
Dr. Nirmal Kumar Gurbani**

**Post Graduate Diploma in Pharmaceutical Management
2012-2014**



**Institute of Health Management Research,
Jaipur
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TO WHOMSOEVER MAY CONCERN

This is to certify that Mr. Aleti Goutham student of Post Graduate Diploma in Pharmaceutical Management (PGDPM) from Institute of Health Management Research, Jaipur has undergone internship training at GVK EMRI Hyderabad from 20th February to 28th May 2014

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.



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The certificate is awarded to

Aleti Goutham

In recognition of having successfully completed his
Dissertation in the department of

Operations Research

And has successfully completed his Project on

**“Analysis of the Un-availed Dispatch and Vehicle Busy cases in Andhra Pradesh and scope
for its improvement.”**

20/05/2014

GVK Emergency Management and Research Institute

He comes across as a committed, sincere & diligent person who has a
Strong drive & zeal for learning

We wish him all the best for future endeavors



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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "**Analysis of the Un-availed Dispatch and Vehicle Busy cases in Andhra Pradesh and scope for its improvement.**" submitted by Aleti Goutham, Enrollment No. IIHMR/PGDHM/2012-14/04-181 under the supervision of Dr.Nirmal Kumar Gurbani for award of Postgraduate Diploma in Pharmaceutical Management of the Institute carried out during the period from 20th February 2014 to 28th may 2014 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



Signature

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Table of Contents

S. No.	Topic	Page No.
1	List of Graphs and Tables	5
2	Abbreviations	7
3	Introduction of GVK EMRI	8
4	Introduction of the project	30
5	Problem Statement	31
7	Research Questions	31
8	Objectives	31
9	Study Design and Methodology	31
10	Demography and Ambulance Allocation in AP	32
11	Trend of Un-availed Dispatch in AP	34
12	District wise distribution of UAD cases	35
13	Selection of Segments from Identified Districts.	35
15	Mandals & Urban/ Rural areas with maximum cases in selected segments.	37
16	Un-availed Cases and Standard Remark	38
17	Un-availed Cases by Emergencies	39
18	Un-availed Cases and Base to Scene Distance	39
18	Multiple Cases assigned through same caller numbers	40
19	Details of UAD calls heard	40
20	Identifying EMTs with maximum number of UAD cases	42
21	Case Closing of UAD cases	42
22	24 hourly trend of UAD in comparison to total cases	43
23	Segment-wise Bifurcation of Un-availed Cases on the basis of Emergency type	44
24	Base to Scene Distance and Response Time per emergency per segment	45
25	Un-availed Cases by Call to Wheel time	49

Table of Contents

S. No.	Topic	Page No.
26	ERO tagging with Call to wheel time in UAD cases	50
27	Checking for Multiple dispatches in Trauma Vehicular Cases	51
28	Analysis of Vehicle Busy in Andhra Pradesh	52
29	Selection of District for the purpose of study	53
30	Selection of Mandals in AP	54
31	Hourly trend of VB v/s Total cases	54
32	Mandal-wise hourly trend of VB to total Cases	55
33	Analysis of VB cases from 1 am to 6 am	55
34	Difference between Admit to Base and Assign to Admit Time	56
35	Relation between Ambulance Downtime and Vehicle Busy	57
36	Summary	58
37	Recommendations	59
38	Monitoring Plan	60
39	Annexure1: UAD Questionnaire	61
40	Annexure 2: Reference Document: Operational Definitions	62
41	References	66

List of Graphs and Tables

S. No.	Graph	Page No.
1	Trend of Un-availed Dispatch in AP	35
2	Mandals and Urban/ Rural areas with maximum cases in selected Rangareddy	38
3	Mandals and Urban/ Rural areas with maximum cases in selected Hyderabad	38
4	Mandals and Urban/ Rural areas with maximum cases in selected Warangal	39
5	Distribution of Un-availed Cases based on Standard Remark	39
6	Hourly Trend of Un-availed Dispatch in 3 major contributory segments	44
7	Trend of Vehicle Busy in A.P.	53
8	Hourly contribution of VB to total Cases in 8 selected mandals.	55

S. No.	Table	Page No.
1	Demography and Ambulance Allocation in AP	34
2	Selection of Districts for study in AP	36
3	Selection of Segments from Rangareddy	36
4	Selection of Segments from Hyderabad	37
5	Selection of Segments from Warangal	37
6	Contribution of Emergencies to UAD Cases in selected segments.	40
7	Distribution of UAD Cases based on Base to Scene Distance	40
8	Analysis of Caller Phone numbers	41
9	Finding from UAD Calls heard	41
10	EMT-wise UAD Cases	43
11	Time taken for Case Closing	43
12	Contribution of Emergencies to Un-availed Cases in 3 segments	45

13	Gandhi - Emergency: Trauma (Vehicular) cases by B to S and Response Time	46
S. No.	Table	Page No.
14	Kukatpally - Emergency: Trauma (Vehicular) cases by B to S and Response Time	47
15	Hanmakonda - Emergency: Trauma (Vehicular) cases by B to S and Response Time	48
16	Hanmakonda - Emergency: Trauma (Vehicular) cases by B to S and Response Time	49
17	Segment-wise UAD by Call to Wheel Time	50
18	Identifying EROs with high Call to Wheel time	51
19	Selection of Districts for VB in A.P	54
20	Selection of Mandals in A.P	55
21	Difference between Admit to base time and Assign to admit time	57
22	Ambulance Downtime v/s VB in AP	58

Abbreviations

VB	Vehicle Busy
UAD	Un-availed Dispatch
AAEMI	Academy of Emergency Medicine in India
AAFP	American Academy of Family Physicians
AAPI	American Association of Physicians of Indian Origin
ACLS	Advanced Cardiac Life Support
AED	Automated External Defibrillator
AHA	American Heart Association
AP	Andhra Pradesh
BLS	Basic Life Support
CCS	Call Center Server
CEMONC	Comprehensive Emergency Obstetrics and Neonatal Care
CHC	Community Health Center
CMU	Carnegie Mellon University
CPR	Cardio Pulmonary Resuscitation
CO	Communication Officer
DO	Dispatch Officer
EMT	Emergency Management Technician
ENT	Ear, Nose, Throat
ERCP	Emergency Response Care Physician
ERO	Emergency Response Officer
ERS	Emergency Response Service
GIS	Geography Information System
GPS	Geography Positioning System
IFT	Inter Facility Transport
ILCOR	International Liaison Committee on Resuscitation
IT	Information Technology
ITLS	International Trauma Life Support
MOU	Memorandum of Understanding
MMU	Mobile Medical Van
NENA	National Emergency Number association
NFPA	National Fire Protection Association
NGO	Non Government Organization
PALS	Pediatric Advanced Life Support
PGPEC	Post Graduate Program in Emergency Care
PHC	Primary Health Center
PHFI	Public Health Foundation of India
PPH	Post Partum Hemorrhage
PPP	Public Private Partnership
RH	Regional Hospital
SNR	Service Not Required
COO	Chief Operating Officer
RCOO	Regional Chief Operating Officer

INTRODUCTION OF THE ORGANIZATION

CHAPTER- 1

INTRODUCTION

1.1 Company Profile

The GVK Foundation represents the overall corporate social responsibility of the GVK group. GVK's vision looks well beyond the bottom line and forays into the initiatives that touch lives and add value to the society. GVK Emergency Management and Research Institute (GVK EMRI) is the major corporate social responsibility arm of GVK group, was established in April, 2005. It provides Integrated Emergency Response services in Public Private Partnership, with a vision to support and build capabilities to save 1 Million lives per annum nationally and establish GVK EMRI as a premier Research and Training Institute.

Dr. GVK Reddy, Chairman of GVK is committed to provide services surpassing global standards with improved transparency, following the modern principles of management and leadership to serve the nation and work towards taking the organization across the country.

GVK is a diversified business entity with a predominant focus on Energy, Urban Infrastructure, Life Sciences, Transportation, Hospitality and Manufacturing.

GVK EMRI is based on the following Standard Practices:

1. Process of Emergency Management which involves the following primary functions:

- Sense: Emergency victim/ attendant dial 108. Communication Officer (CO) Screen helps facilitate collect facts, Dispatch Officer (DO) Screen helps facilitate and scope emergency, assign strategically located vehicle (Ambulance/ Police/ Fire).
- Reach: Vehicle(s) to reach the site/scene
- Care: Emergency Medical Technician (EMT) to provide passionate pre-hospital care while transporting patient/ victim to appropriate hospital for stabilization. Emergency Response Centre Physician (ERCP) advises patient care with the support of ERO, EMT to ensure optimal pre-hospital care.

The Government of India has allotted a three-digit number – 108 and made it toll-free across each State for Medical, Police and Fire Emergencies. 108 are accessible from fixed lines and mobile phones.

GVK EMRI provides ERS (Emergency Response Services) under PPP framework and manage 4178 state of the art **Ambulances** in **Andhra Pradesh, Gujarat, Uttarakhand, Goa, Tamil Nadu, Karnataka, Assam, Meghalaya, Madhya Pradesh, Himachal Pradesh, Chhattisgarh, Daman - Diu and Dadra Nagar Haveli, Uttar Pradesh, Kerala** while ensuring pre-hospital care and covering a population of > 600 million.

2. Employees: Our employees are known to be **Energetic, Modest, Reliable and Inquisitive** and exhibit high levels of **Commitment, Ability, Resourcefulness and Empathy** while performing their respective roles - Communication Officer, Dispatch Officer, Emergency Medical Technician, Pilot, Physicians and support staff.

3. Infrastructure: GVK EMRI Head Quarters is **housed** in 39 acres **campus** at Hyderabad with modern facilities for Emergency Management, Research and Training.

4. Technology: State of the art integrated technology is deployed in our Emergency Response Centers in 14 States & 2 Union Territories which enables us to provide world class services.

5. Alliances and partnership-

A. Governments:

12 State governments (Andhra Pradesh, Gujarat, Uttarakhand, Goa, Tamil Nadu, Karnataka, Assam, Meghalaya, Madhya Pradesh, Himachal Pradesh, Chhattisgarh and Uttar Pradesh) & 2 Union Territories (Daman Diu, Dadra Nagar Haveli) in India have recognized GVK EMRI as nodal agency for emergency response services. GVK EMRI recognizes critical role of Governments for the success of the projects undertaken under PPP framework. Our ongoing and uninterrupted services since inception in 12 States & 2 Union Territories speak for itself about healthy relationship with respective Governments. GVK EMRI in collaboration with Govt. of Goa for runs Emergency rooms in Community Health Centers (CHC) also.

B. Global Institutions:

GVK EMRI is having partnership with global organizations like Stanford School of Medicine, Carnegie Mellon University, 9-1-1, Shock Trauma Centre, Baltimore, USA; American Association of Physicians of India; GEOMED etc., in order to strengthen its competencies, skills and to adopt the best international practices.

GVK EMRI is recognized as international training organization by AHA (American heart Association) and ITLS (International Trauma Life Support) to conduct training programs on their behalf. GVK EMRI also in collaboration with Stanford School of Medicine, USA is conducting training programs in Emergency care for physicians & Paramedical staffs of Government hospitals. Mahindra Satyam is the technology partner of GVK EMRI in providing free IT solutions.

6. PPP (Public Private Partnership) framework

- Operational expenses and Infrastructure borne by Government (Public)
- GVK EMRI bears costs of Leadership, Technology, Innovation, Research & Training

The **Values** of GVK EMRI are:

- Involving people
- Applying Knowledge
- Making this happen

Vision:

- To provide Free emergency response services for Medical, Police and Fire emergencies across India in PPP (Public Private Partnership) framework
- To respond to 30 million emergencies and save 1 million lives annually
- To deliver services at global standards through Leadership, Innovation, Research & Training and Technology

Emergency Management at GVK EMRI

The Emergency Management system at GVK EMRI has been successfully providing most comprehensive & efficient Emergency Response Services (Medical, Police and Fire) under PPP framework for the past 7 years.

Today Emergency Management wing of GVK EMRI has:

- An agreement with 14 states (Andhra Pradesh, Gujarat, Uttarakhand, Goa, Tamil Nadu, Karnataka, Assam, Meghalaya, Madhya Pradesh, Himachal Pradesh, Chhattisgarh, Kerala, Uttar Pradesh & 2 Union Territories (Daman and Diu, Dadra and Nagar Haveli) and currently operating in 14 states.
- 7, 000 ambulances, covering over > 600 million population
- 23,566+ GVK EMRI Associates.
- An agreement with 6,700 + Private Hospitals/ Nursing homes
- Networked with 2,000 Police/ Fire Stations

With contribution of all the stakeholders listed above, GVK EMRI is:

- Taking 90% calls in first ring
- Attending 16,682+ emergencies per day (19.3 Million Cumulative)
- Pregnancy related – 33%, Vehicular Trauma – 17%, Acute Abdomen – 12%, Cardiac – 5%, Respiratory – 4%, Suicidal – 4%, Animal Bites -2% (Jun'12)

Key Components of Emergency Management at GVK EMRI:

1. Integrated and comprehensive ERS, Village Outreach Services provider:

The emergency management system at GVK EMRI aims at providing most comprehensive & efficient Emergency Response Services in medical, police or fire, using a single 3 digit toll free number 108. GVK EMRI has the expertise and is fully equipped to respond to medical emergencies including complex ones like cardiac arrests, strokes, neonatal, maternal, snake bites and emergencies like natural calamities, accidents, fire break-outs, industrial hazards, rioting, terrorist attacks etc. GVK EMRI also provides MMU Services in Andhra Pradesh and Uttarakhand. GVK EMRI also supports the Andhra Pradesh, Assam, Uttarakhand and Gujarat Population under JSSK Scheme for drop back facilities for the mother and neonate after initial 48 hour hospitalization.

2. Public and Private Partnerships (PPP):

GVK EMRI has been successfully providing ERS under PPP framework. Operational and Capital expenditure of running the service in each state is met by the respective State Governments (Public) while GVK EMRI (Private) contributes to costs of Leadership, Management, Innovation (Process, Medical & Research) and Mahindra Satyam provides IT solutions.

3. Ambulances:

GVK EMRI has developed its own ambulance design specifications with unique features meeting ergonomic and safety requirements. Ambulances are fully equipped with modern day medical and communication equipment and categorized as Advanced Life Support, Basic Life Support and Rural Life Support depending on the facilities and pre-hospital care services available.

4. Processes: S-R-C model

At every level in GVK EMRI, integration is the keyword. Not only it works as a single response centre for all emergencies – Medical, Police and Fire, but also, it has developed the Sense-Reach-Care paradigm that integrates the critical areas of emergency response system (call taking, processing and ambulance dispatching, reaching the victim in time and transportation to a hospital, Pre-Hospital medical care rendered through Medical Directions by Physicians).

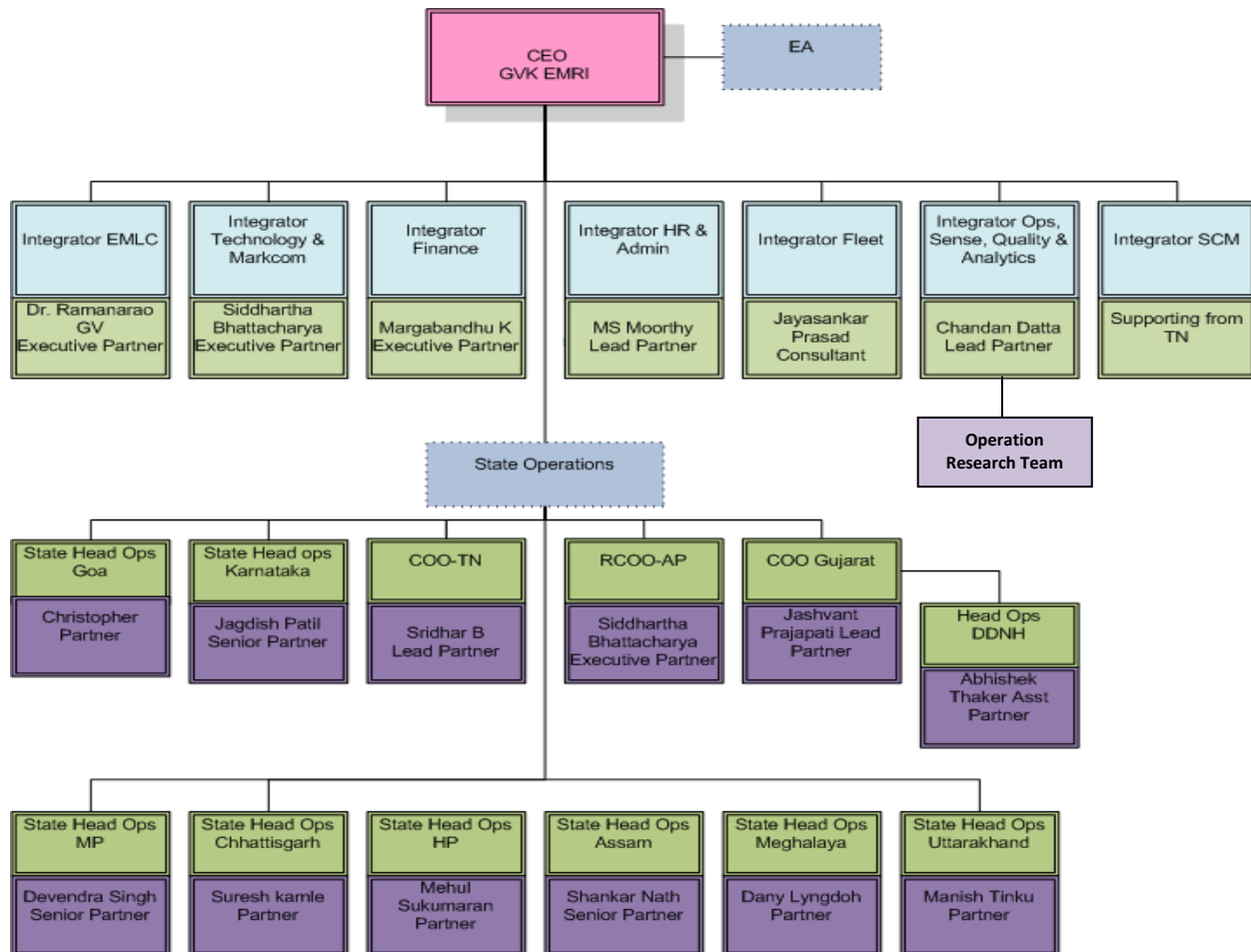
5. **JSSK (Janani Shishu Suraksha Karyakaram):** GVK EMRI also operates Vehicles/ Services in Partnership with AP, Assam, Uttarakhand and Gujarat Governments JSSK Program (Reverse Transport/ Drop Back Services (AP), Adarani Services (Assam), Khushion Ki Sawari (Uttarakhand) and Khilkhilat (Gujarat) to ensure wholesome support for the mother and child which provides for drop back facility for mother and child to curtail IMR, MMR. These services are offered to the mother and child if they have continued to stay in the Government Hospitals for 48 Hours of Child Birth.
6. **MMU (Mobile Medical Units):** GVK EMRI operates MMUs in AP, Uttarakhand since Dec '10 and Jun '11 respectively with the aim to reach the underserved villages in the districts in organizing regular primary health services. The focus is on diagnostic, curative and preventive health services. Maternal and Child health services and treatment of common ailments are prioritized
7. **104 Health Helpline Services:** GVK EMRI is slated to launch the 104 Head Advice Helpline Services in Partnership with the Government of India (in the Union Territories of Daman and Diu, Dadra and Nagar Haveli) shortly.

8. Technology

GVK EMRI is managing Emergency Response Service with own ERS application software. Presently, it has 24 x 7 Centralized Emergency Response Center for each State, having following key technological components:

- Telecom Switch / PBX with automatic call distribution features & IVR facility
- Computer Telephony Integration
- Voice Loggers
- Call Center Server (CCS)
- ERS Applications
- GIS and GPS Software
- Automatic Vehicle Location and Tracking
- GIS Maps

ORGANOGRAM of GVK EMRI



Source: GVK EMRI HR department

We, the new joiners working in capacity of Management Trainee form a component of **Operations Research Team**.

Impact of GVK EMRI

Size	• One Center for 40 M population against one for every 0.05 M population in USA • 600+ M population covered in 14 States (increased reach of health care in rural, hilly & tribal areas) and 2 Union Territories • Trained ~95,357 people (25,180 - EMTs, 20,340 – Pilots, 8,336 - Doctors, 10,688 - Nurses, 12,909 - First Responders, 14,537 - AHA/ ITLS Certification programs and 3,367 – Misc Training programs • 16,682+ emergencies handled per day (19.3 Million cumulative) • 7000+ Ambulances ~4 trips a day per ambulance • 23,566+ GVK EMRI Associates (as on Mar '13)
Speed	• Went live in less than 4 months from signing MoU • 90% calls answered in first ring • <17 minutes (urban) and <25minutes (rural) Ambulances reached
Type of Emergencies and Lives saved	• Pregnancy related – 33%, Vehicular Trauma – 17%, Acute Abdomen – 12%, Cardiac – 5%, Respiratory – 4%, Suicidal – 4%, Animal Bites -2% (Mar'13) • ~568+ lives were saved per day (6.4 lakhs) and 16,682+ victims per day receive timely, high-quality pre-hospital care
Qualitative Outcomes	• Angel of Mercy – 108 Ambulance • Successful PPP • Well documented systems, impressive EMT training, high order management competence • A historic landmark in health care delivery system • Built more trust in the health system as a whole • Increased institutional deliveries and reduced maternal mortalities by ~18% (Chapter Name: Strategies for Safe Motherhood in India: A case study of GVK EMRI; Book: "Health, Poverty & Human Development

Summary Facts of GVK EMRI

S.N	State	Date of signing MOU	Date of Launch	Ambulances as on Mar' 31.2013	No of Emergencies Attended Since Inception	No of Pregnancy related cases Since Inception	Lives saved in Lakhs
1	Andhra Pradesh	19th Sep 2006	15th Aug 2005	802	7368296	1461415	108574
2	Gujarat	29th Aug 2007	29th Aug 2007	525	3543146	1212549	248171
3	Uttarakhand	8th March 2008	15th May 2008	140	538688	188235	10926
4	Goa	14th June 2008	5th Sep 2008	33	192954	13209	13248
5	Tamilnadu	6th May 2008	15th Sep 2008	620	2274276	528533	76183
6	Karnataka	14th Aug 2008	1st Nov 2008	517	2409587	941545	72419
7	Assam	8th July 2008	6th Nov 2008	285	1313672	492853	59620
8	Meghalaya	5th Nov 2008	2nd Feb 2009	46	66323	17959	7372
9	Madhya Pradesh	25th Nov 2007	16th July 2009	274	525859	198395	29591
10	Himachal Pradesh	9th July 2010	25th Dec 2010	112	251950	48050	4479
11	Chhattisgarh	17th May 2010	25th Jan 2011	240	375600	154682	15365
12	D&NH and Daman & Diu	26th Aug 2011	10th April 2012	13	13552	3305	732
13	Uttar Pradesh	21st Dec 2011	14th Sep 2012	988	392,118	191,585	-
	National			4,595	19266021	5452315	646680

Source: Analytics department **GVK EMRI**

Integration of Emergency Management with Institute and Research

Research and Analytics:

Research wing of GVK EMRI is now recognized by Government of India. It is a fully established wing of GVK EMRI working in the following areas:

- **Medical Research** - Effectiveness of interventions and integration with hospital care
- **Systems Research** - Develop protocols for pre-hospital care, standing orders for EMTs, pre-arrival instructions, lives saved processes, medical direction and manuals for First Responder, Training of Trainers and First Responder Handbook.
- **Operations Research (Analytics)** - Predict future state of healthcare, disease incidence, better utilization of resources, reconfiguring processes

Training:

3rd fully established wing of GVK EMRI, established with an aim of creating new cadre of professionals across the country who are well trained to drive (Pilot), diagnose and impart pre hospital care (Emergency Medical Technicians), provide virtual handholding (Emergency Response Centre Physicians) and manage emergency centers. With all these motives it has:

- Established in house state-of-the-art training facilities for rendering foundation and refresher training program to EMTs and Pilots, First Responder Training program, Skill Development programs for Doctors and Nurses.
- Initiated 2 years Post Graduate Program in Emergency Care (PGPEC) in collaboration with Stanford and affiliated to Osmania University.
- Received recognition by American Heart Association (AHA) as International Training Organization for BLS, ACLS & PALS programs.

- Recognition as a nodal training centre for imparting training in Trauma Management by International Trauma Life Support Society.
- Received recognition by American Academy of Family Physicians (AAFP) to conduct Advanced life Support in Obstetrics and Basic life Support in Obstetric programs
- Developed well equipped Training facilities with modern teaching aids including manikins and simulation lab.
- Received distinction of training more than 76,000 including First responders, EMTs, pilots, doctors, nurses etc.

a. American Heart Association (AHA), USA



All training programs offered by AHA are conducted at GVK EMRI. The programs are as follows

1. Basic Life Support (BLS) Provider and Instructor
2. Advanced Cardiac Life Support (ACLS) Provider and Instructor
3. Pediatric Advanced Life Support (PALS) Provider and Instructor; The courses offered at GVK EMRI has obtained recognition/ affiliation from international training bodies like American Heart Association (AHA), International Trauma Life Support (ITLS), USA. GVK EMRI already has signed the Memorandum of understanding (MOU) with Academy of Emergency Medicine in India (AAEMI), American Association of Physicians of Indian Origin (AAPI).

b. AHA certified courses ACLS, BLS conducted by GVK EMRI.

AHA -The American Heart Association (AHA) is a national voluntary health agency whose mission is "Building healthier lives, free of cardiovascular diseases and stroke."

GVK EMRI received the ITO (International Training Organization) status in recognition to the large pool of qualified instructors and technologically advanced simulated laboratory facilities. A series of training programs for Doctors and other currently active healthcare providers is being launched who wish to undergo the AHA certified course.

The different courses offered by GVK EMRI and certified by AHA are

- 1) ACLS (Advanced Cardiac Life Support)
- 2) BLS (Basic Life Support)

BLS / ACLS Provider Course is designed to enhance survival by improving the quality of care provided to the adult victim of a cardiac arrest or other cardiopulmonary emergency. At the end of the course, you will enhance your knowledge and skills to perform cardiopulmonary resuscitation techniques in emergency cardiovascular care, as recommended by the recent ECC 2005 guidelines given by AHA and International Liaison Committee on Resuscitation (ILCOR).

Basic Life Support (BLS)

The Basic Life Support course will be a one day workshop that will impart basic life support training. The delegates will be trained to resuscitate a victim of cardiac arrest without the use of advanced equipment or drugs. The BLS Course will cover the following content.

1. CPR for adults/ children / infants
2. Adult and child bag mask technique
3. 2- rescuer CPR for adults / children
4. Use of Automated External Defibrillator (AED)
5. Relief of choking/ foreign body aspiration

Advanced Cardiac Life Support (ALS)

The BLS course will be followed by a two day workshop that imparts intensive training in advanced cardiopulmonary resuscitation. The delegates will be trained to resuscitate a victim using advanced monitoring equipment and lifesaving drugs. They will also be trained in the resuscitation team concept.

1. Management of respiratory arrest
2. Pulseless arrest
3. Bradycardia/ A systole
4. Tachycardia - stable / unstable

5. Mega code & Resuscitation team concept

Gvk Emri-Adherence to Essential Components:

GVK EMRI has fostered **partnerships** within and outside India. The fact that **Police help, ambulance help and Medical direction** is provided less than one roof, in PPP, is unheard of in India.

GVK EMRI has innovated on Emergency Management Service (EMS) models of the developed countries and has developed innovative, state of the art **technology**. The service is **NOT only free but qualified and experienced doctors in the call center** are readily accessible to patients and Emergency Medical Technicians (EMTs) to provide direction.

India as a country needs to come up with appropriate **legislations and regulations** in order to ensure standardized EMS services. **Human resources** play pivotal role in saving lives and hence competent manpower both in the pre-hospital situations and emergency rooms, should be adequately **trained** and made available. In order to meet these requirements, the Government needs to recognize the Emergency Medical Technicians (EMTs) and emergency medicine as a specialty medical discipline.

Prevention of emergencies needs to be emphasized at all levels in the society at large and healthcare delivery system in particular. **Public Education** on early recognition of emergencies and need for first aid as well as early & timely medical advice seeking attitude can supplement the efforts of service providers. Government and Civil Society organizations may take this up together. Accessibility through **definitive care in emergencies** is the major challenge in our country. Ambulance based pre-hospital care initiatives will facilitate reduction of delays in accessing curative services.

Government at various levels has already come out with standards at Primary Health Care Institutions and Community Health Centers. It has also established norms for different levels of Trauma Care Centers. The ongoing National Rural Health Mission has adequately recognized the importance of emergencies during pregnancy and newborn period and established Comprehensive Emergency Obstetric and Neonatal Care (CEMONC) Centers across the nation. Likewise emergency

room infrastructures need to be streamlined to attend other important medical conditions like heart attacks and paralytic strokes, diabetic emergencies etc. EMRI organizes programs to enhance capabilities of doctors in emergency medicine. EMRI in collaboration with national and international institutions will continue to focus in identifying requirements for an ideal **information system** in emergency medical care and services. **Evaluation** reports highlighting incidence of emergencies, and cost effectiveness of the interventions will pave way for allocation of resources from all quarters.

JUSTIFY THE LINES

Introduction to Emergency Management – Need & Response

With the rising incidence of emergency cases in terms of medical, road accidents, fire accidents and crime in India, the country has over a period of time, acknowledged the importance of EMS, though it has yet to accord the priority status that it deserves. To manage the unforeseen circumstances or emergencies, there needs to be adequate infrastructure in place as in other developed countries.

EMS essentially involves organization and management of resources, their roles and responsibilities to deal with all aspects of emergencies, including preparedness, response and care. The EMS providers use plans, structures, and predetermined arrangements to coordinate the efforts of Governments, voluntary and private agencies, and other organizations (these may include police, fire, public & private hospitals, telecom service providers, NGOs, district administration etc.) to effectively deal with the entire spectrum of emergency requirements.

GVK EMRI based on successful experience in Andhra Pradesh would be the ideal body to coordinate the above mentioned activities through Public Private Partnership to provide integrated emergency management services to all the citizens of India. Successful beginning was made in Andhra Pradesh. GVK EMRI can provide the expertise to all the interested parties setting up in the entire state comprehensive emergency management services for **Medical, Police and Fire** with our dedicated multi functional and technical teams.

Gvk Emri as Emergency Management Service Provider

Emergency Management demands multi-dimensional participation, coordination and assistance of multiple agencies and disciplines. The EMS providers maintain a synergistic relationship between Technology, Process and People, to provide holistic care and services to emergency victims. The key factors that make EMS significant for the individuals are discussed below:

- **Manages the Golden Hour efficiently:** The first one hour of the medical emergency is considered to be very critical and is hence considered to be the Golden Hour. It is estimated that about 80% of deaths happen within the first one hour of admissions. Broadly, the Golden Hour concept could be applied to any emergency such as fire and police. For instance, according to NFPA, US (National Fire Protection Association), if a fire is not suppressed within 8 to 10 minutes of its occurrence, it will flashover, spreading outside the initial area. In such situations, an EMS provider offers appropriate services within the most critical time span to minimize the extent of damage.
- **Presence of sound infrastructure:** During emergencies, there should be a helpline that could be contacted and necessary support infrastructure and services that could be promptly accessed and utilized. EMS providers possess required infrastructure which includes a call center or other contact rooms where the information about the emergency could be communicated. Further, they have requisite dispatch systems such as ambulance, police or fire brigades. They have a trained support staff that could deal with the distressed directly and initiate necessary actions.
- **Deploys necessary resources:** It is important to have necessary resources at one's disposal in case of an emergency. EMS providers offer these requisite tangible and intangible resources. The tangible resources include ambulances, EMTs (Emergency Management Technicians), fire brigades etc. The intangible resources are offered in terms of care and other services.
- **Harness strong linkages/ partnerships/ alliances:** The ability to apply immediate and correct emergency procedures is critical. This could be in terms of first referral hospital(s) or immediate reporting to police or fire station. The EMS providers have strong linkages with hospitals, doctors, police, fire stations etc. Their intricate network ensures that the services are offered to affected site/ people through the nearest and most appropriate network partner.

- **Hassle free procedures:** In case of an emergency, especially at times of road accidents, thefts etc several legal procedures need to be dealt with, which often leads to delay in necessary actions. The EMS providers have hassle free procedures wherein they provide pre-hospital care in case of medical emergencies.

GVK EMRI - Esteemed Partners

For benchmarking with the best in the world, GVK EMRI has collaborations and alliances with various organizations worldwide. This helps GVK EMRI in strengthening its service delivery by sharing knowledge, inculcating best practices, absorbing better technologies and innovating. Partners in progress are:

- **National Emergency Number Association (NENA)** is the “Voice of 9-1-1”, a non-profit membership association representing both public and private constituents, based in the Washington DC metropolitan area of the United States of America. The National Emergency Number Association (NENA) and the GVK Emergency Management and Research Institute (GVK EMRI) signed an MOU on August 14, 2005 jointly strive to promote, support and advance the mission and goals of each and to work together whenever possible and appropriate.
- **Hospitals:** The MOU signed with hospitals, both government and private hospitals state the purpose and need for the partnership clearly. It seeks the acceptance of the hospitals to receive appropriate cases for stabilization or treatment or both, depending on the facilities, skills and equipment the hospital has.
- **American Association of Physicians of Indian Origin (AAPI),** AAPI is an organization representing physicians and medical students, residents and fellows of Indian origin in the US. AAPI and GVK EMRI’s primary objectives include excellence in pre-hospital care, teaching and applied research in different areas of emergencies and to pursue their aspirations in professional and community affairs
- **Shock Trauma Centre :** GVK EMRI has signed a MoU with Shock trauma centre to share protocols on Emergency

- **Singapore Health Services:** GVK EMRI has signed MoU with Singapore Health Services for providing Training to Doctors in Emergency Department.
- **Carnegie Mellon University, USA** and GVK EMRI signed a MoU for participation in collaborative research programs, development of appropriate technologies / solutions in Emergency Management.
- **Geomed Research, Germany** and GVK EMRI signed a statement of Alliances, towards improvement of GIS based emergency health systems data utilization and related research and emergency response services internationally.

PARTNERSHIPS

Working towards benchmarking with the best in the world, GVK EMRI has international collaborations.

Mahindra Satyam – Technology Partner

Satyam as the Technology Partner helped GVK EMRI to develop an emergency response system using Microsoft® Technologies. Satyam has won the International “MICROSOFT 2007 CITIZENSHIP PARTNER OF THE YEAR AWARD” for developing software technology solutions of GVK EMRI. All activities of the call center have been automated and 108 now provides a state-of-the-art response center that has saved thousands of lives



by providing timely emergency services. Satyam helps GVK EMRI in identifying appropriate technologies, components, tools and processes and also helps in competency building and absorbing appropriate new technologies to develop efficient solutions.

Stanford University USA.

Stanford School of Medicine, USA, is an institution dedicated to medical education. GVK EMRI has signed MoU with Stanford School of Medicine for providing training to Emergency Medical Technicians. GVK EMRI in association with Stanford started two year Post Graduate Programs in Emergency Care



Geomed Research, Germany

Geomed Research and GVK EMRI signed a statement of Alliances, towards improvement of GIS based emergency health systems data utilization and related research and emergency response services internationally.



Carnegie Mellon University (CMU), USA

Carnegie Mellon University and GVK EMRI signed a MoU for participation in collaborative research programs, development of appropriate technologies / solutions in Emergency Management.

Public Health Foundation of India (PHFI)



Through the MoU signed on 13th August 2008, PHFI nad GVK EMRI will work together to establish opportunities, including fellowships and internships, building capacity through short and long term training programs, research in relevant areas of public health; encourage dialog, participation in appropriate public health, injury and emergency medical services system development ; Establish opportunities to promote the development of global initiatives for prevention of emergencies in India as opportunities and resources permit; establish partnerships with appropriate interested parties to promote the development of public health, injury and emergency medical services systems in other regions of India.

AAFP - American Academy of Family Physicians



American Academy of Family Physicians (AAFP) has recognized GVK EMRI as center for conducting Advanced Life Support in Obstetrics (ALSO) certification course. ALSO is now conducted in 59 countries across the world. 21 Instructors were also certified to conduct ALSO courses at GVK EMRI. American Faculty held the courses in November 2011 and facilitated ALSO provider and Instructor programs. Doctors, Nurses and Paramedical personnel and EMTs will be immensely benefitted by the emergency obstetric care skills from the ALSO program 2-days hands on ALSO program use lectures and workstation methodology. Safety in Maternity Care, Vaginal Bleeding in Late Pregnancy, Preterm Labor, Labor Dystocia, Medical Complications, and First Trimester Complications are focused in lectures. In work stations Shoulder Dystocia, Assisted Vaginal Delivery, Malpresentations- OB Cases, PPH/ Maternal Resuscitation are the focus areas

Awards & Recognitions

0. Award for **“Demonstrating Leadership in Emergency Care”** by HEAL (Health Essayists and Authors League) on 23rd September, 2009 in New Delhi
1. CSI Nihilent e-Governance **Special Jury Award** on 18 December 2008 in New Delhi
2. NASSCOM-CNBC **IT User Award 2008** on 26 November 2008 in Mumbai
3. **Award for Excellence in Disaster Management** from DMICS in October 2008 at the 1st World Congress on Disaster Management
4. E-India Award for **“Best NGO Initiative”** on 31 July 2008 in Delhi
5. Named “Laureate” and awarded **The Computer World Honors Leadership** in June 2008 at Washington DC
6. **Microsoft Citizenship Partner of the Year Award** from Microsoft on 11 July 2007 at Denver, USA
7. Received **Presidential NENA Award** during NENA Annual Conference in June 2007 at Charlotte, USA
8. **Best Corporate Social Responsibility Award** from ITM Business School and DNA in January 2006 in Mumbai
9. Microsoft Award for using the **best Technology to Sense the Emergencies**
10. **TERI award and FICCI award** for **best CSR initiatives** in the Country
11. **Government of India coveted recognition as a research organization** in 2011 by DSIR, SIRO
12. **eINDIA award 2011 in eHEALTH** category conferred by Department of Science and Technology, Government of Gujarat in association with Department of Information and Technology, Ministry of Communication and IT, Government of India
13. The NASSCOM Social innovation Honours 2012 (NSIH) grand jury has unanimously decided to honor **GVK Emergency Management and Research Institute** in the category of Multi Stakeholder Partnership

14. **GVK EMRI** Assam received the **Runner-Up in 6th National Road Safety Award conferred on 29th Feb'12** at A P Shinde Symposium Center New Delhi at the 13th National Road Safety Convention organized by **Ministry of Road Transport & Highways**
15. **GVK EMRI 108** service won the **Innovation for India Awards 2012** in **Public Service category** in a grand event organized by the **Marico Innovation Foundation**

**Analysis of the Un-availed Dispatch and Vehicle
Busy cases in Andhra Pradesh and scope for its
improvement.**

Background:

Emergency Service Functions-

There are three main emergency service functions:

- **Police** — providing community safety and acting to reduce crime against persons and property
- **Fire department** (fire and rescue service) — providing firefighters to deal with fire and rescue operations, and may also deal with some secondary emergency service duties
- **Emergency medical service** — providing ambulances and staff to deal with medical emergencies

Medical emergency services are dedicated to provide out-of –hospital acute medical care during transportation to a health centre. It is most commonly referred as ambulance service.¹ 108 is a universal emergency number in India. GVK EMRI handles medical, police and fire emergencies through 108 emergency services. It is a free service operating through PPP model. It operates over 7000 ambulances across 14 states and 2 Union Territories in India. With the increasing health issues and Road traffic accidents, it has become important to rescue the patient within the 1st hour of emergency that is the golden hour. This responsibility is bestowed on GVK EMRI 108 ambulance service.

Un-availed Dispatch and Vehicle Busy are terminologies associated with ambulance service ⁴.

Un-availed Dispatch (UAD) cases are those where ambulance cannot find or serve the patient. The reasons for UAD include, high response time (time taken by ambulance to reach the scene from base location.), Victim has already shifted to hospital, hoax call or address being unclear ambulance could not reach the scene. The current definition of UAD also includes SNR en-route (Service Not Required en-route) which means en-route to the incident location the victim called and confirmed that he does not require the service anymore.

A Vehicle Busy Case is where ambulance cannot be assigned due to: ambulance being busy, already on a dispatch, ambulance breakdown/ off road or where ambulance cannot be reached within reasonable time frame.

UAD and VB interfere with successful operations of service to the level of 100%.

Explain briefly the terms UAD and VB to the reader

Problem Statement:

In Andhra Pradesh, the current level of UAD (Use full form) is 14.73% for February 2013(Reference). It has decreased over previous months but not to that extent. About 15% of total emergency cases cannot or are not able to avail our services. With UAD being highest among all the states, reducing it remains to be a big challenge in A.P.

The current level of Vehicle Busy in Andhra Pradesh is 3.6%. It has declined steadily from 5.3% in December 2012 to 3.6% in February 2013. Though it is close to the target of 3%, about 2962 emergency cases were denied the service including pre-hospital care as the ambulance was busy. Again maintaining it to that level and further reducing it remains a major challenge.

Research Question:

1. What are the potential causes that are leading to high percentage of UAD and VB in Andhra Pradesh
2. What are the possible measures that can be taken to decrease it?

Objectives:

- 1. To understand the pattern of Un-availed Dispatch and Vehicle Busy.
- To identify and state the major reasons.
- To identify maximum contributory segments.
- To conduct a Root- Cause analysis.
- To suggest strategies for improvement.

Study Design and Methodology:

- Type of Study: Retrospective analytical study design.
- Location of study: Andhra Pradesh
- Duration of study: 4 months
- Sampling type: Purposive sampling (selecting segments for UAD and mandals for VB giving maximum number of such cases)
- Sample size: 1541 for UAD, 495 for VB

- Sampling frame: UAD and VB cases in selected segments for the months of December, January and February.
- Data (information) to be collected- Secondary data from IT/IS department of GVK EMRI A.P
- Primary Data has to be collected by interviewing the subjects from selected segments with the help of data collection tool.
- Data collection tools- Semi-structured questionnaire

Demography and Ambulance Distribution in Andhra Pradesh.

Andhra Pradesh is comprised of 3 regions namely Vishakapatnam, Hyderabad, Kadapa divided in 23 districts. As per 2011 Census total population of A.P. is about 8.5 crores.

Table.1 Demography and Ambulance Allocation in Andhra Pradesh

S.N	District	Total Segments	Area (In'000 sq.m)	Population	Density pop/sq km	Total allotted ambulance
	A.P.	752	275	84665533	308	802
1	Adilabad	32	16.1	2737738	170	32
2	Anantapur	37	19.1	4083315	213	39
3	Chittoor	40	15.2	4170468	275	42
4	East Godavari	37	10.8	5151549	477	39
5	Guntur	35	11.4	4889230	429	38
6	Hyderabad	22	0.2	4010238	18480	25
7	Karimnagar	32	11.8	3811738	322	36
8	Khammam	31	16	2798214	175	33
9	Krishna	35	8.7	4529009	519	38
10	Kurnool	32	17.7	4046601	229	34
11	Mahabubnagar	32	18.4	4042191	219	33
12	Medak	26	9.7	3031877	313	29
13	Nalgonda	36	14.2	3483648	245	40
14	Nizamabad	27	8	2552073	321	29
15	Prakasam	32	17.6	3392764	192	35
16	Rangareddy	40	7.5	5296396	707	42

17	S.P.S Nellore	28	13.1	2966082	227	30
18	Srikakulam	28	5.8	2699471	462	30
19	Vishakhapatnam	41	11.2	4288113	384	43
20	Vizianagaram	27	6.5	2342868	358	29
21	Warangal	41	12.9	3522644	274	40
22	West Godavari	33	7.7	3934782	508	36
23	Y.S.R (Kadapa)	28	15.4	2884524	188	30

Note: Out of 802, 50 are back-up ambulances leaving 1 ambulance per segment: 752 ambulances for 752 segments in Andhra Pradesh.

Source: census of India, 2011 ⁵ and GVK EMRI

Findings:

Trend of Un-availed Dispatch in Andhra Pradesh

In the graph below a comparison is shown month-wise between Un-availed Dispatch as a component of total emergencies.

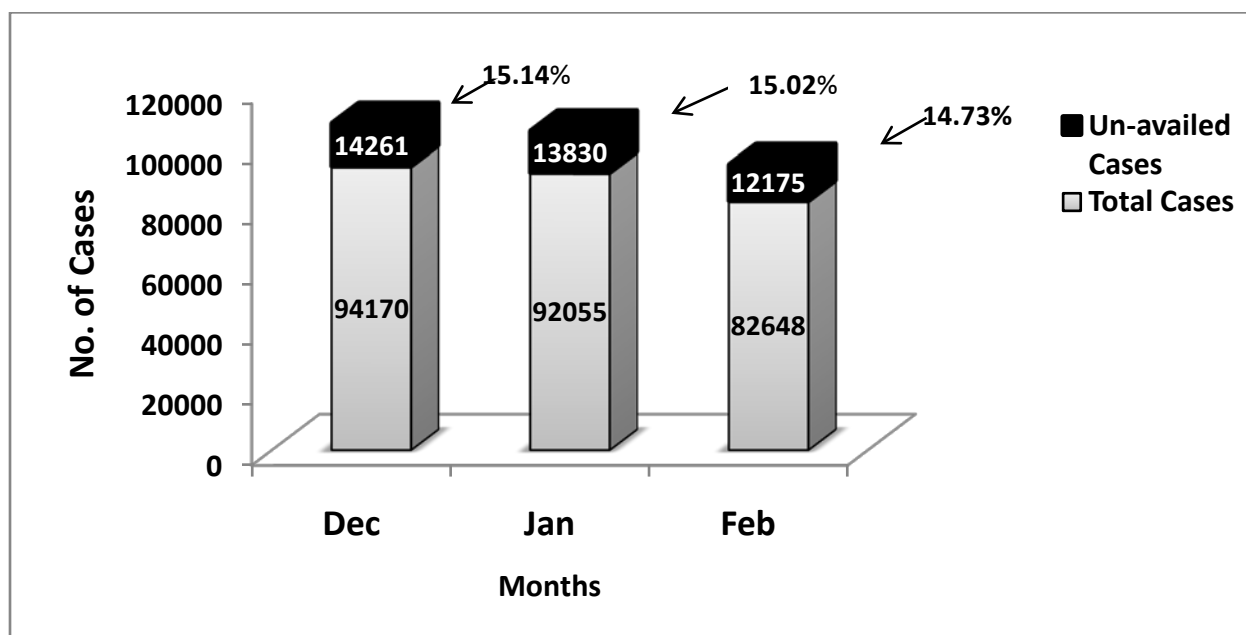


Fig.1: Trend of Un-availed Dispatch in A.P.

Above figure shows a decreasing trend of Un-availed Dispatch. It has decreased progressively by 0.41% from December 2012 to January 2013. Total emergencies also show a decreasing trend.

District wise distribution of Un-availed Dispatch cases.

For the purpose of study, the study universe is of 3 districts from 23 districts in A.P. is selected depending on their contribution to total UAD cases in the state. All 23 districts in descending order of count of UAD cases in the following table

Selection Criteria: Based on Contribution to total UAD in A.P.

S. N	District	Count of Cases	% of Total	S. N	District	Count of UAD Cases	% of Total
1	<u>Rangareddy</u>	<u>3636</u>	<u>9.0%</u>	13	West Godavari	1610	4.0%
2	<u>Hyderabad</u>	<u>2361</u>	<u>5.9%</u>	14	Kurnool	1451	3.6%
3	Vishakapatnam	2342	5.8%	15	Khammam	1387	3.4%
4	<u>Warangal</u>	<u>2243</u>	<u>5.6%</u>	16	Nellore	1357	3.4%
5	Guntur	2077	5.2%	17	Kadapa	1296	3.2%
6	Krishna	2045	5.1%	18	Prakasam	1279	3.2%
7	Mahabub Nagar	2007	5.0%	19	Medak	1253	3.1%
8	Chittoor	1988	4.9%	20	Nizamabad	1222	3.0%
9	East Godavari	1952	4.8%	21	Adilabad	1172	2.9%
10	Nalgonda	1899	4.7%	22	Vizianagaram	1170	2.9%
11	Karim Nagar	1868	4.6%	23	Srikakulam	958	2.4%
12	Anantapur	1690	4.2%	24	Grand Total	40266	100.0%

Table2. Selection of Districts for study in A.P.

The above 3 highlighted districts have been selected for the purpose of study. Warangal is selected over Vishakapatnam to give a wider geographical picture. These 3 districts together account for 20.5% of total UAD cases in the state.

Selection of Segments from identified Districts.

Further, from selected districts segments are selected depending on their contribution to total cases in the district as mentioned ahead.

Selection Criteria: Segments contributing about 30 % of all UAD cases in the district.

Rangareddy

S.N	Segments	Count of UAD Cases	% of Total
1	Kukatpally	347	10%
2	Uppal	249	7%
3	Qutbullapur	181	5%
4	L.B.Nagar	172	5%
5	Malkajgiri	170	5%

Table 3. Selection of Segments from Rangareddy:

The above mentioned segments contribute to 33% of total cases in Rangareddy district. The highlighted segment Kukatpally is contributing to maximum of all cases (10%)

Selection Criteria: Segments contributing about 30 % of all UAD cases in the district.

Hyderabad

S.N.	Segments	Count of UAD Cases	% of Total
1	Gandhi	316	13%
2	Charminar	187	8%
3	Mehadhipatnam	169	7%
4	Langer House	146	6%

Table 4. Selection of Segments from Hyderabad:

The above mentioned segments contribute to 34% of total UAD cases in Hyderabad district.

Selection Criteria: Segments contributing about 30 % of all UAD cases in the district.

Warangal

S.N.	Segments	Count of UAD Cases	% of Total
1	Hanmakonda	302	13%
2	Warangal	184	8%
3	Marripeda	126	6%
4	Mulug	111	5%

Table 5. Selection of Segments from Warangal

The above mentioned segments contribute to 32% of total UAD cases in Warangal district.

Gandhi, Kukatpally and Hanamkonda segments have been highlighted since it contributes to maximum of all segments in respective districts mentioned above. The data pertaining to these segments would hence be used for a detailed analysis ahead.

Mandals and Urban/ Rural areas with maximum cases in selected segments:

The cases in selected segments are further sorted into smaller geographic boundaries: mandals and urban/rural areas to see areas giving maximum concentration of cases.

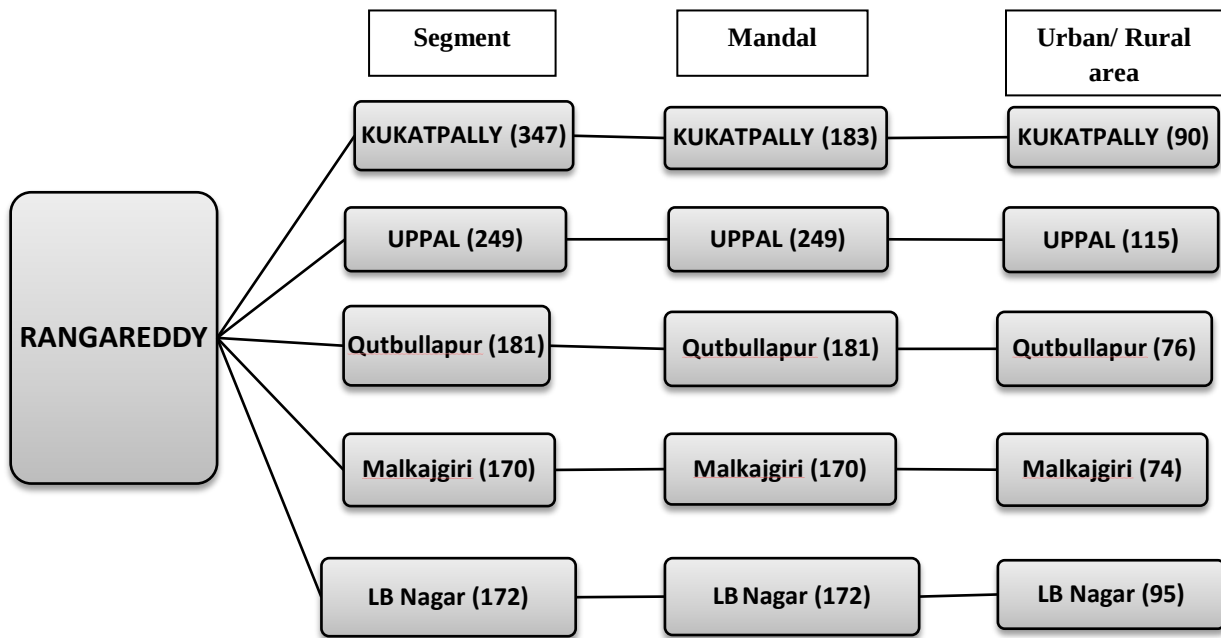


Fig.2: Mandals and Urban/ Rural areas with maximum cases in Rangareddy

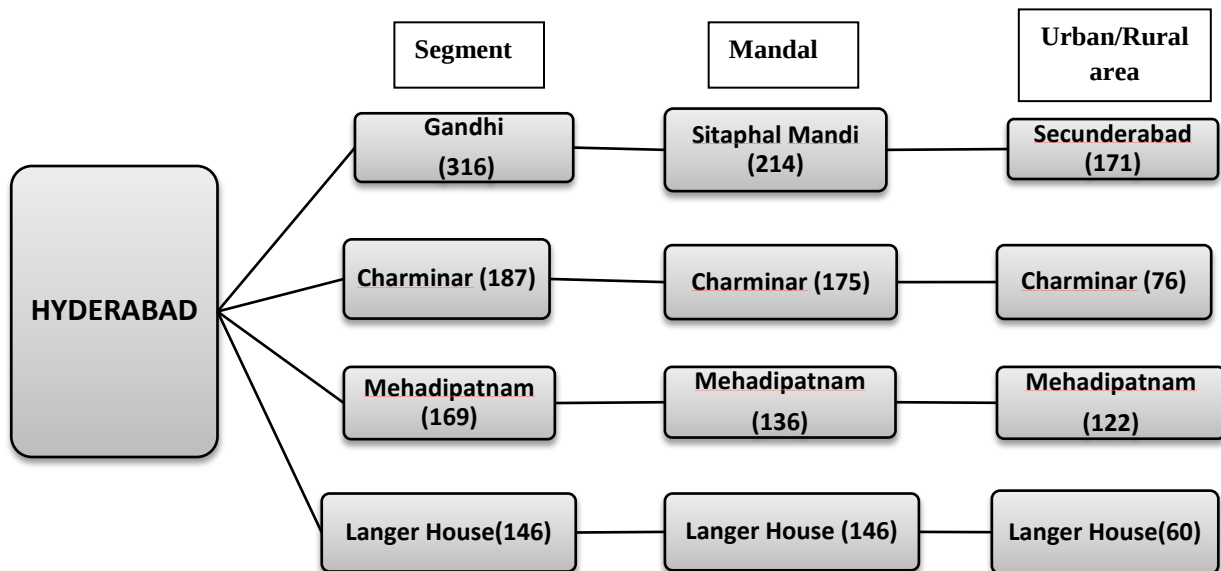


Fig.3: Mandals and Urban/ Rural areas with maximum cases in Hyderabad

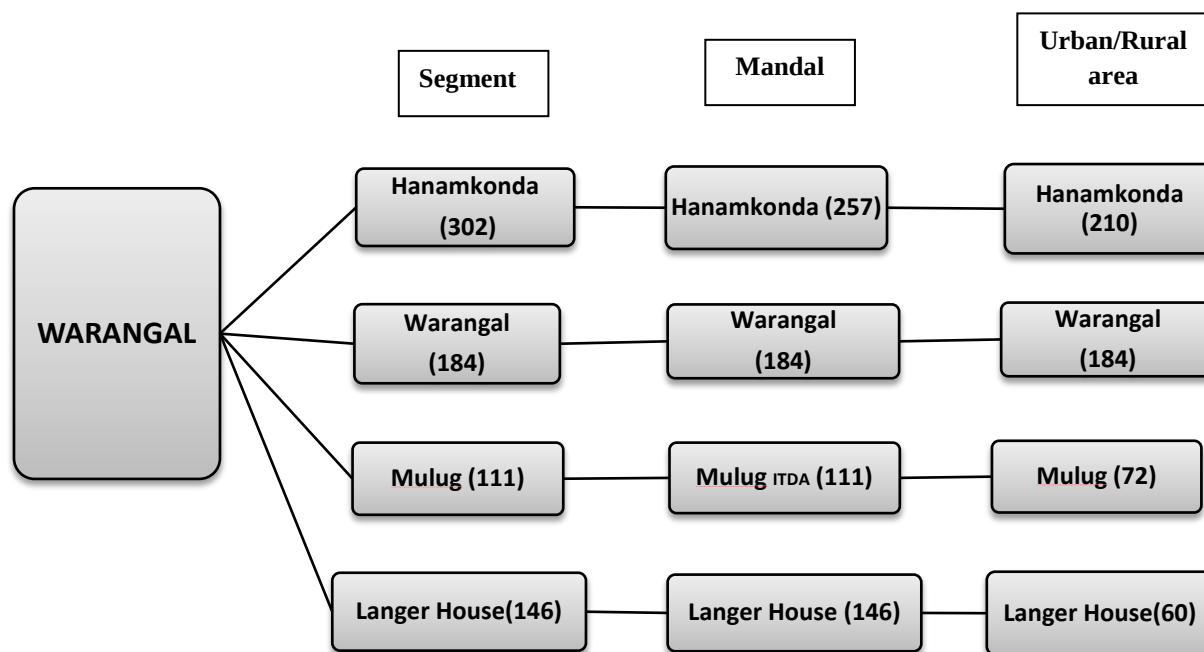


Fig.4: Mandals and Urban/ Rural areas with maximum cases in Warangal

The above figure shows that count of UAD cases are maximum closest to the base location of ambulances which is located at segment level. This is suggested by the same name of Segments, Mandals and Urban-Rural areas.

Un-availed Cases and Standard Remark

Standard Remark is one of the columns in database. It represents the reasons why case went into Un-availed Dispatch. The above mentioned are types of standard remarks by which Un-availed Dispatch cases get tagged. These are self-explanatory

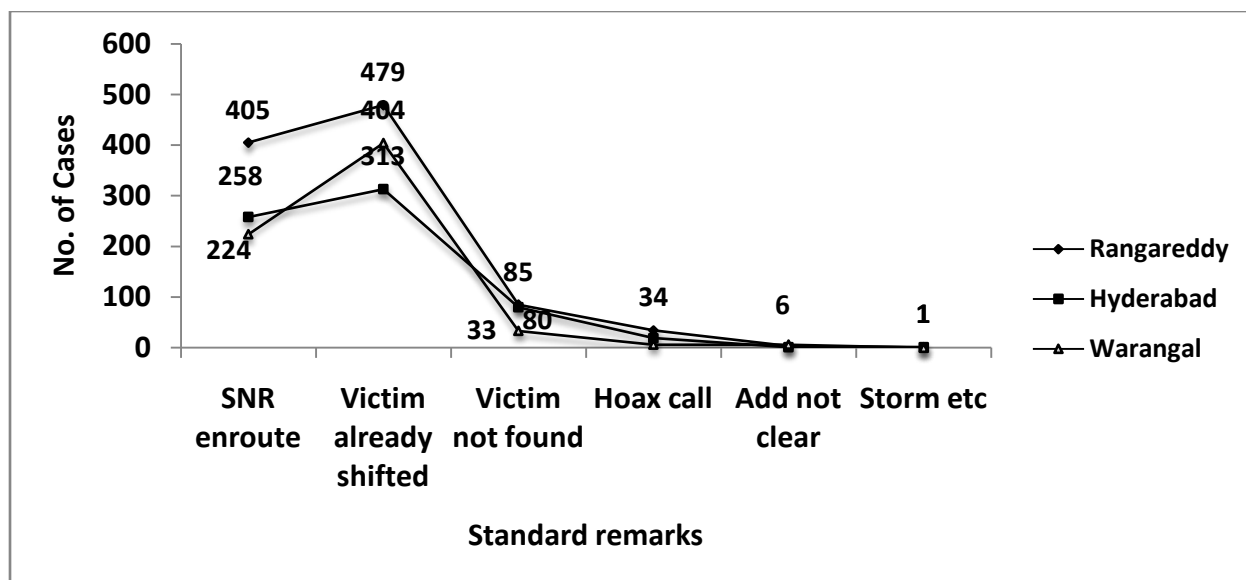


Fig.5 Distribution of Un-availed Cases based on Standard Remark:

From the fig, maximum cases have standard remark: Victim already shifted () followed by SNR enroute. There are only few cases of Hoax call, Address not clear and Storms, incessant rains etc in A.P.

Un-availed Cases by Emergencies

As per rawdata sheet, each case is tagged into an emergency type depending on the medical chief complaint of that patient

S.N	Emergency Name	Count Of Cases	% Of Total
1	Trauma (Vehicular)	1045	44%
2	Epilepsy	96	4%
3	Pregnancy Related	89	3.7%
4	Trauma (Non-Vehicular)	80	3.3%
5	Cardiac Cases	74	3%
6	Rest	1000	42%
7	Total	2384	

Table.6: Contribution of Emergencies to Un-availed Cases in selected Segments:

Trauma (vehicular) is responsible for maximum cases (44%) of total UAD cases in selected segments. This is followed by Epilepsy (4%) and Pregnancy related (3.7%). A detailed analysis of top 3 segments based on emergency has been done ahead

Un-availed Cases and Base to Scene Distance

Base to Scene distance is the distance between ambulance base location and scene where patient is present. UAD cases are compared on the basis of Base to Scene Distance to see at which distance UADs are maximum.

:

SrNo	B to S (km)	Count of Cases	% of Total	SrNo	B to S (km)	Count of Cases	% of Total
1	1km	249	21%	9	9km	39	3.2%
2	2km	118	10%	10	10km	36	3%
3	3km	160	13.3%	11	11km	13	1%
4	4km	167	14%	12	12km	13	1%
5	5km	139	11.5%	13	13km	14	1%
6	6km	104	8.6%	14	14km	14	1%
7	7km	69	5.7%	15	15km+	34	3%

Table.7: Distribution of Un-availed Cases Based on Base to Scene distance

Note: For all the top 4 emergencies, Cases at 1km Base to Scene Distance are the highest, it being 21% of total UAD cases.

Multiple cases assigned through same caller numbers:

From Case closure data of UAD cases of selected segments caller numbers were obtained. Every case once assigned has to be closed through an outbound call from Emergency Response Centre to the respective ambulance catering the case.

Sr No	Caller number	Total UAD	District	Caller	SrNo	Caller number	Total unavailed cases	District	Caller
1	4039191900	19	Multiple	Other	8	4023261166	4	Hyderabad	Other
2	9959098388	10	Hyderabad	EMT	9	8008303342	4	Warangal	EMT
3	9704550832	6	Hyderabad	EMT	10	8179621806	4	Warangal	EMT
4	9490160543	5	Warangal	EMT	11	8179621815	4	Warangal	Other
5	9492025010	5	Warangal	Other	12	8978801543	4	Hyderabad	EMT
6	9949995429	4	Rangareddy	EMT	13	9866554079	3	Rangareddy	EMT
7	9949995431	4	Rangareddy	EMT					

Table.8 Analysis of Caller Phone Numbers:

As per the above table, it was found that 135 numbers were responsible for multiple UAD cases during the 3 months. Few numbers (13) with total UAD cases selected on the basis of total Un-availed cases count are mentioned in the table above- 9 out of above 13 set of calls were made by EMT ³. Besides these, 22 callers have called 3 times and 98 callers have called 2 times.

Details of UAD Calls Heard

For further clarification of why cases assigned through EMTs went into Un-availed Dispatches, respective calls were heard from Call Log data in ERC. The calls were in Telugu language and so an interpreter was used to translate these calls.

1. 19 previous cases were diverted from 104 (Women Helpline no.)
2. 7 IFT cases registered by EMT went UAD
3. 9 Cases where EMT called to transfer case to other EMT due to various reasons- VB, Vehicle Breakdown, unable to reach scene etc
4. 3 cases where EMT called to get back the previous assigned case which he had transferred
5. 11 cases EMT got the patient and called ERC to get it assigned and take Incident ID and Call time. Out of which 7 were Reverse Transport cases. 1 was EMTs relative, 2 were RTA. In 1 case EMT gave first aid to the victim
6. 3 cases where police had called but no ERO conference call
7. 3 calls were from Railway Station
8. 6 cases Caller was calling for independent reasons. 1 Caller called thrice for RTA case. Each case was different. The caller seemed drunk.
9. No Call details were available for 5 calls.
10. In 1 case call got disconnected when ERO said Namaste 108
11. There was Confusion about a case because of which the case went into SNR once and UAD once

Table.9 Findings from UAD Calls heard

Inference:

1. Ideally when a new Case ID and Call time is assigned to a case, the previous ID is cancelled during Case closing. But to what extent this is practiced is a question mark as seen in 2 instances

where the EMT calls to transfer the assigned case to other EMT and then Calls back after sometime to get back the case and both have been registered as UAD cases in the system.

2. There is a problem EROs knowledge about geography since in 5 instances ERO has taken > 5 mins to spot the exact incidence location so as to assign appropriate ambulance.
3. Problem of EMT behavior is evident in his laid back attitude.
4. Wrong tagging of Cases in UAD during case closure. For e.g.: One of the calls was of only a second and still it went into UAD.

In order to further investigate cases where EMT were callers, where they mention in ERC call that patient had approached them and they had called in ERC to get Case Id and Assign time yet these cases went into UAD, Patient Care Records for these cases were asked for from the PCR department. According to PCR department, they belong to PCR pending category. They had noted this problem before when they had asked EMTs for explanation. According to EMTs these are Canceled Ids and so there are no PCR forms for these cases. Ideally by standard norms PCR forms should be generated even for Cancelled Ids.

To Check for True Id Cancellation: The Call logs following the calls for UAD cases made by EMTs (17) were checked for a call back from the same EMT number. By protocol, if EMT/ ambulance are approached by patient to cancel the trip before ambulance moves from base location, EMT should cancel the Id by calling in ERC. On checking the call logs; in none of the cases a following call from EMT to cancel the case was found making authenticity of EMTs explanation questionable.

This requires further probing and on Superior's instructions the matter was transferred to HR department for further scrutiny.

Identifying EMTs with maximum number of UAD cases:

Emergency Medical Technicians are actually responsible for service to reach to people making it of crucial importance to compare and study Count of Cases per EMT.

S. N	Emt no	Emt name	District	UAD Ct	% of Total	S.N	Emt no	Emt name	District	UAD Count	% of Total
1	9372	L.Suresh	Warangal	59	2%	16	4252	S.M. Ahmed	Hyderabad	37	1%
2	37698	Ravindra Mandal	Hyderabad	53	2%	17	6491	D. Surender	Warangal	37	1%
3	22308	Papa Tantati	Rangareddy	52	2%	18	9329	B. Nagaraju	Warangal	37	1%
4	12650	Prasanna Thanagala	Rangareddy	50	2%	19	9335	P. Naresh	Warangal	37	1%
5	9045	Ambadas A	Hyderabad	48	2%	20	13954	Dashrat	Rangareddy	37	1%
6	39192	Raghipathi	Hyderabad	48	2%	21	13796	K.Swathi	Warangal	36	1%
7	20560	V. Nagaraju	Rangareddy	47	2%	22	37670	Suresh M	Rangareddy	36	1%
8	4141	MD. Dastagir	Warangal	44	2%	23	5280	Ashok Kumar B	Hyderabad	35	1%
9	5610	J. Sudha	Warangal	44	2%	24	4070	Raju Kadari	Hyderabad	34	1%
10	9321	J. Karnakar	Warangal	42	2%	25	32204	Venkateshwarlu K	Rangareddy	34	1%
11	33093	Sudhakar	Hyderabad	42	2%	26	33002	V. Kumar Shiluvveru	Hyderabad	34	1%
12	6482	K. Sateesh	Rangareddy	41	2%	27	19688	Krishna Prasad V	Rangareddy	33	1%
13	20587	M.S. Reddy	Warangal	41	2%	28	32965	Malles Karkuri	Rangareddy	33	1%
14	33853	P. Pragidimarri	Rangareddy	41	2%	29	108083	Not available	Hyderabad	32	1%
15	21207	K.S. Dasari	Hyderabad	38	1%	30	17010	R. Gantagogu	Rangareddy	31	1%

Table.10 EMT- wise UAD cases:

In selected segments every UAD case was tagged with the Emergency Medical Technician (EMT) who had handled the case. From above data it is to be noted that 30 EMTs had > 30 UADs. Besides this, 19 EMTs had 30-20 UADs, 59 had 19-5 UADs, 56 had <=5 UADs and 106 EMTs had 1 UAD in the past 3 months. Total EMTs- 271.

Case Closing of UAD cases

For each Emergency call received by ERO, he generates a CaseID and takes Case details. Every Case has to be closed by an outbound call from ERC once CaseID is generated. The target is to achieve Case Closure within 30 minutes. Efforts are in process to achieve Case Closure at least on the same day.

Days from assignment of Case	Count of Cases	% of Total
0	515	25%
1	1145	56%
2	250	12%
3	105	5%
4	46	2%
Grand Total	2061	

Table.11: Time taken for Case Closing

Above table reflects time after which UAD cases were closed in ERC. This is of importance for UAD. Lesser the time gap, better it is since this will help to reduce cases falsified by EMTs and will free the vehicle for further assignment. The table shows that only 25% of UAD cases were closed on the same day. Maximum (56%) cases were closed the next day.

24 hourly Trend of Un-availed Cases in Comparison to Total Cases

The total cases every hour are compared with Un-availed Cases in that hour to see if the trend of both match. It should have a similar trend. Hour-wise Un-availed dispatch as a component of total cases is depicted below.

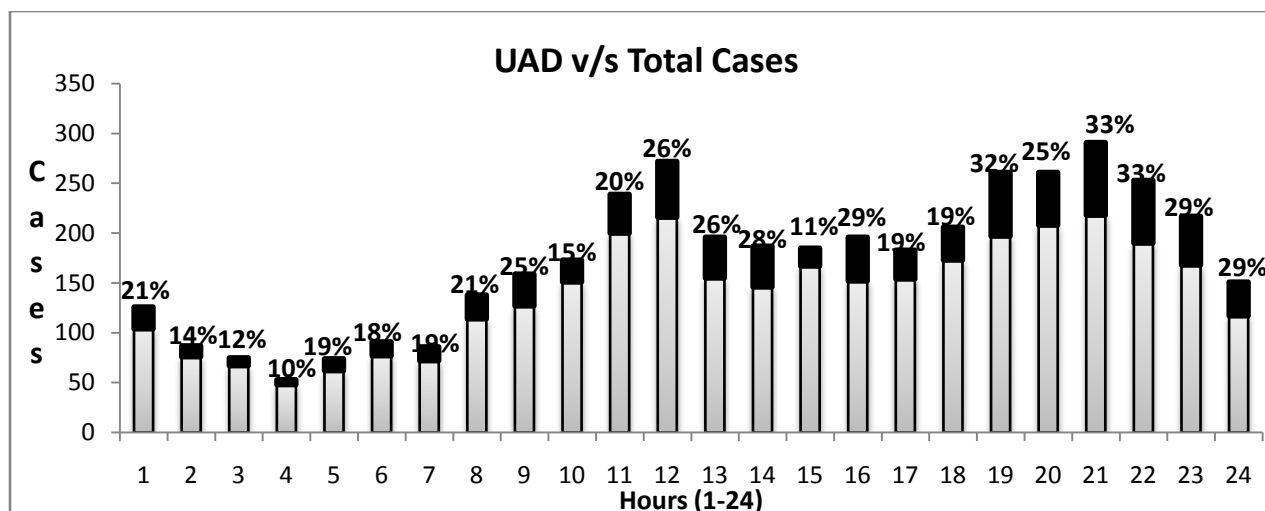


Fig.6: Hourly Trend of Un-availed Cases in 3 major contributory segments- Gandhi, Kukatpally, Hanamkonda as a % of total cases (Availed+ Un-availed+ SNR+ VB) in that hour

The above figure shows that hourly trend of Un-availed Dispatch cases matches that of hourly trend of total cases with 33% of total cases being UAD during peak hour of 9 and 10pm.

Segment-wise Bifurcation of Un-availed Cases on the basis of Emergency type

For each of the selected 3 segments count of UAD cases per emergency is calculated below.

GANDHI				KUKATPALLY			
Sr No	Emergency Name	Count of Cases	% of total	Sr No	Emergency Name	Count of Cases	% of total
1	Trauma (Vehicular)	114	36%	1	Trauma (Vehicular)	170	49%
2	Epilepsy	32	10%	2	Pregancy related	18	5%
3	Trauma (non Vehicular)	14	4%	3	Cardiac/Cardiovascular	17	5%
4	Pregancy related	13	4%	4	Trauma (non Vehicular)	16	5%
5	Acute Abdomen	10	3%	5	Epilepsy	11	3%

Table.12: Contribution of Emergencies to Un-availed cases in 3 Segments

HANAMKONDA			
Sr No	Emergency Name	Count of Cases	% of total
1	Trauma (Vehicular)	127	42%
2	Suicide attempt	21	7%
3	Epilepsy	18	6%
4	Cardiac/Cardiovascular	13	4%
5	Respiratory	9	3%

Source: **GVK EMRI** Analytical department

As per raw data sheet, each case is tagged into an emergency type depending on the medical chief complaint of that patient. In these selected segments, trauma (vehicular) emergencies are contributing maximum to Un-availed dispatch cases: 36% of total UAD cases in Gandhi, 49% of that in Kukatpally and 42% of that in Hanamkonda.

Base to Scene distance & Response Time per Emergency per Segment:

In table below, for each of 3 selected segments, Trauma (vehicular) emergency cases are sorted by Base to scene distance in km and Response time taken by the ambulance to reach scene. Since Trauma (vehicular) cases are majorly responsible for un-availed dispatch, targeting them becomes the priority.

Dist in Km	R T in mins	Cases	Total I	Dist in Km	R T in mins	Cases	Total I	Dist in Km	R T in mins	Cases	Total
1 (TC- 13)	5	5	38%	3 (TC- 10)	10	2	100 %	5 (TC- 8)	10	2	25%
	6	1	62%		11	3			11	1	100 %
	7	1			12	1			13	1	
	8	1			13	2			14	1	
	9	1			21	1			16	1	
	14	1			22	1			19	1	
	16	2		10	1	25	1				
2 (TC- 11)	9	3	100 %	4 (TC- 12)	11	3	100 %	6	14	1	100 %
	10	2			13	1		7 (TC- 2)	20	1	100 %
	11	1			14	1			22	1	100 %
	12	2			15	2		9	39	1	100 %
	13	1			16	2		10	17	1	100 %
	14	1			17	1		Total		59	
	29	1			22	1		Blank		22	

Table.13: Gandhi - Emergency: Trauma (Vehicular) cases by B to S and Response Time

Ideal response time based on Base to Scene distance is: 5 mins for 1-2 km, 7 mins for 3-4 km, 10 mins for 5-6 kms and so on. As noted in the above table, in 38% of total cases at 1 km distance and 25% of cases at 5 km distance ambulance reached in an acceptable time frame. In these cases Response time does not seem to be a contributory factor for Un-availed Dispatch. In all the other cases ambulance could not reach in time suggesting delay being a significant contributory factor for UAD .

Dist in Km	R T in mins	Cases	% of Total	Dist in Km	R T in mins	Cases	Total	Dist in Km	R T in mins	Cases	Total	Dist in Km	R T in mins	Cases	Total
1 (TC-20)	3	1	40%	3 (TC-14)	3	1	14%	4	14	2		6 (TC-7)	12	1	100%
	4	5			8	1			15	3			14	2	
	5	2			9	1			16	1			15	1	
	6	1	10		2	17	1		16	1					
	7	3	11		3	19	1		19	1					
	8	2	13		1	21	1		27	1					
	9	1	16		1	22	1		7	1		17%			
	10	2	17		1	24	1		14	1					
	13	2	19		2	27	1		16	2		83%			
	16	2	25		1	43	1		18	1					
2 (TC-12)	6	2	100%	4 (TC-26)	3	1	15%	5 (TC-12)	3	1	42%	8 (TC-5)	23	1	100%
	7	1			5	1			7	2			17	1	
	8	1			7	1			9	2			20	1	
	9	1			8	1			11	1			22	2	
	10	4			9	1	12		1	34	1				
	11	1			10	2	13		1	14	1				
	19	1			11	1	14		2	21	1				
	20	1			12	2	16		1	24	1				
				13	3							30	1		

Table.14: Kukatpally - Emergency: Trauma (Vehicular) cases by B to S and Response Time

Dist in Km	R T in mins	Cases	Total
10 (TC- 2)	34	1	100%
	40	1	
12 (TC- 2)	16	1	50%
	24	1	50%
13 (TC- 1)	13	1	100%
14 (TC- 1)	25	1	100%
	27	1	
17 (TC- 1)	30	1	100%
Grand Total		112	
Blank		61	

In Kukatpally segment, the response time looks better than in Gandhi. With 40 % of trauma (vehicular) cases at 1km distance, 14 % of them at 3 km distance, 15% of them at 4 km distance, 17% at 7 km

distance and 50% of cases at 12 km distance being cases in which ambulance is reaching in acceptable time frame.

Dist in Km	R T in mins	Cases	Total	Dist in Km	R T in mins	Cases	Total	Dist in Km	R T in mins	Cases	Total		
1 (TC- 18)	3	2	33%	3 (TC- 11)	9	3	100%	6 (TC- 9)	7	1	22%		
	4	2			10	4			9	1			
	5	2			12	1			12	2			
	6	3			13	2			13	1			
	7	3	67%	4 (TC- 12)	14	1	8%	7 (TC- 5)	14	2	78%		
	10	1			7	1			15	1			
	12	1			10	1			16	1			
	14	1			12	1			12	1			
18	1	13	1		100%	8 (TC- 9)	15	2	20%				
2 (TC- 12)	7	3	14				4	16		1	16	1	80%
	8	1	15				1	23		1			
	9	1	16				1	16		3			
	10	1	17		1	19	1						
	11	1	22		1	100%	9	21	3	100%			
	14	1	5 (TC- 9)	13	3			22	1				
	15	1		14	2			26	1				
	100%	16		1	100%			18	1		100%		
		18		2		17	1	10 (TC- 3)	23	1		15%	
		20	1	22		1	23		1				
23				1				27	1				

Dist in Km	R T in mins	Cases	Total
11 (TC- 13)	21	1	100%
	22	1	
	34	1	
12 (TC- 1)	24	1	100%
13 (TC- 2)	19	1	100%
	24	1	
15 (TC- 2)	26	1	100%
	32	1	
16 (TC- 1)	23	1	100%
17 (TC- 3)	11	1	50%
	34	2	50%
18	38	1	100%
26	38	1	100%
Grand Total		103	
Blank		30	

Table.15: Hanmakonda - Emergency: Trauma (Vehicular) cases by B to S and Response Time

In Hanamkonda, 33% cases at 1 km distance, 8% cases at 4 km distance, 22% cases at 6 km distance, 20% at 7 km distance, 15% at 10 km distance and 50% cases at 17 km distance ambulance is reaching on time.

GANDHI				KUKATPALLY				HANAMKONDA			
Dist in Km	R T in mins	Cases	Total	Dist in Km	R T in mins	Cases	Total	Dist in Km	R T in mins	Cases	Total
1	5	1	50%	5	28	1	100%	1	16	1	100%
	10	1	50%	7	22	1	100%	2	8	1	100%
Grand Total		2		8	16	1	100%		10	1	
Blank		10			22	1			5	14	1
				16	18	1	100%	11	17	1	100%
				Grand Total		5		Grand Total		5	
				Blank		4		Blank		1	

Table.16: Segment-wise Pregnancy Related cases by B to S distance & Response Time

There are few cases of pregnancy responsible for Un-availed Dispatch. But Pregnancy is an emergency where patient can wait. Hence bringing un-availed dispatch due to pregnancy under control is completely achievable and so an emphasis on these cases. Only in 1 case in Gandhi segment, ambulance has reached within 5 minutes and still could not find the patient. Thus decreasing Response Time would take care of Pregnancy related UAD cases.

Un-availed Cases by Call to Wheel Time:

Call to wheel time is a component of Base to Response time. It needs to be looked into separately because it reflects time taken by Emergency Response Officer to assign a case to the ambulance. It reflects Call response efficiency as well as ERO' efficiency. Ideally Call to Wheel time or Assign time should not be more than 3 minutes.

GANDHI						KUKATPALLY						HAMNAKONDA						
T (in mins)	Cases	% of Total	T (in mins)	Cases	% of Total	T (in mins)	Cases	% of Total	T (in mins)	Cases	% of Total	T (in mins)	Cases	% of Total	T (in mins)	Cases	% of Total	
1	3	34%	11	2		1	11	50%	11	1		1	5	54%	10	1		
2	21		12	2		2	37		14	1		2	54		11	1		
3	42		13	1		3	62		25	1		3	55		Total	208	100%	
4	48	66%	18	2		4	43	50%	37	1	100%	4	37	46%				
5	32		20	1		5	27		41	1		5	29					
6	22		21	1		6	20		Total	219		100%	6		12			
7	11		42	1		7	9						7		5			
8	7		Total	199	100%	8	3						8		3			
9	3					9	2						9		6			

Table.17: Segment-wise UAD by Call to Wheel Time

From the above table, in 66% of total cases in Gandhi, 50% of that in Kukatpally & 46% of that in Hanamkonda Call to Wheel time exceeds 3 mins with ERO' taking as high as 11 mins to assign a case.

ERO TAGGING with Call to Wheel time in UAD Cases:

It is crucial to identify EROs taking high assign time. The purpose is to plan refresher training for these EROs and give them warning. EROs with Call to wheel time > 5 mins in selected segments have been mentioned in table below tagging the cases with ERO Unique Identity No. (ERO id)

No	ERO id	C to W time (mins)	No	ERO id	C to W time (mins)	No	ERO id	C to W time (mins)	No	ERO id	C to W time (mins)	No	ERO id	C to W time (mins)
1	eroa108223	7	13	eroa108355	7	25	eroa36983	6	37	eroa38535	7	49	eroa39361	6
2	eroa108228	6	14	eroa108355	7	26	eroa37333	8	38	eroa39074	6	50	eroa39361	8
3	eroa108232	6	15	eroa19150	8	27	eroa37409	42	39	eroa39074	9	51	eroa42879	6
4	eroa108308	6	16	eroa19150	9	28	eroa37463	6	40	eroa39076	18	52	eroa43661	7
5	eroa108309	20	17	eroa30861	6	29	eroa37463	11	41	eroa39079	42			
6	eroa108311	7	18	eroa30861	9	30	eroa38234	7	42	eroa39080	7			
7	eroa108314	6	19	eroa32017	8	31	eroa38236	8	43	eroa39080	14			
8	eroa108314	7	20	eroa34251	10	32	eroa38236	11	44	eroa39348	7			
9	eroa108315	6	21	eroa35334	9	33	eroa38388	6	45	eroa39349	6			
10	eroa108315	8	22	eroa36866	10	34	eroa38389	7	46	eroa39353	55			
11	eroa108315	9	23	eroa36880	6	35	eroa38528	7	47	eroa39354	7			
12	eroa108348	6	24	eroa36982	6	36	eroa38529	11	48	eroa39355	11			

Table.18: Identifying EROs with high Call to Wheel time

Few EROs have taken > 40 mins to assign a case. The authenticity of this data needs to be validated since it is practically too much.

Checking for multiple dispatches in Trauma (vehicular) cases:

In RTA i.e Trauma (vehicular) emergencies, there are chances of Multiple Dispatches of ambulance since multiple callers (people passing the scene) call for the same case. When different landmarks are given by callers, more than ambulance can get assigned for the same case. In order to measure magnitude of multiple dispatch cases, callers of all 51 trauma(vehicular) cases within 1 km Base to scene distance from top 3 segments i.e Gandhi, Kukatpally and Hanamkonda were called back and asked if they/ patient was taken to hospital by 108 ambulance. Out of 51, 40 callers responded. The rest

were not reachable, switched of or not responding. Out of 40 responders, 27 replied that they had not used GVK EMRI 108 ambulance service while 12 replied that they had; indicating 12 out of 38 cases of multiple dispatch. Almost all of the Multiple Dispatch cases took place in Hanamkonda segment (10).

Caller Response of February UAD cases:

Randomly selected 40 UAD Cases within 1 km B to S distance and with Response time of < 5 mins for February month were called:

- To check for ERO's behavior- Only 2 out of 40 Callers said ERO was rude and he was disappointed with the service, 37 said ERO was soft spoken and 1 did not respond to this question.
- To check for EMT calling on his way to scene-
 - i. In 14 out of 40 cases: EMT didn't call
 - ii. In 12 out of 40 cases: EMT called once
 - iii. In 6 out of 40 cases: EMT called twice
 - iv. In 4 out of 40 cases: EMT called thrice.
- To check for EMT intimation about ETA- 6 out of 26 were not intimated. As per the remaining 20 caller, the ETA they gave ranged from 10 to 30 minutes when Response time suggests them to have reached within 5 minutes.
- To check for EMT intimation about distance- Only in 2 cases EMT mentioned distance; 1 case as 4km and 2nd 18 km.
- Wrong Tagging - 4 SNR cases: in 3 cases victim said that they do not require service in conference call. In 4th case when EMT called victim before moving from base the patient said SNR.

ANALYSIS OF VEHICLE BUSY IN ANDHRA PRADESH

Trend of Vehicle Busy in Andhra Pradesh

In the graph below a comparison is shown month-wise between Vehicle Busy as a component of total emergencies.

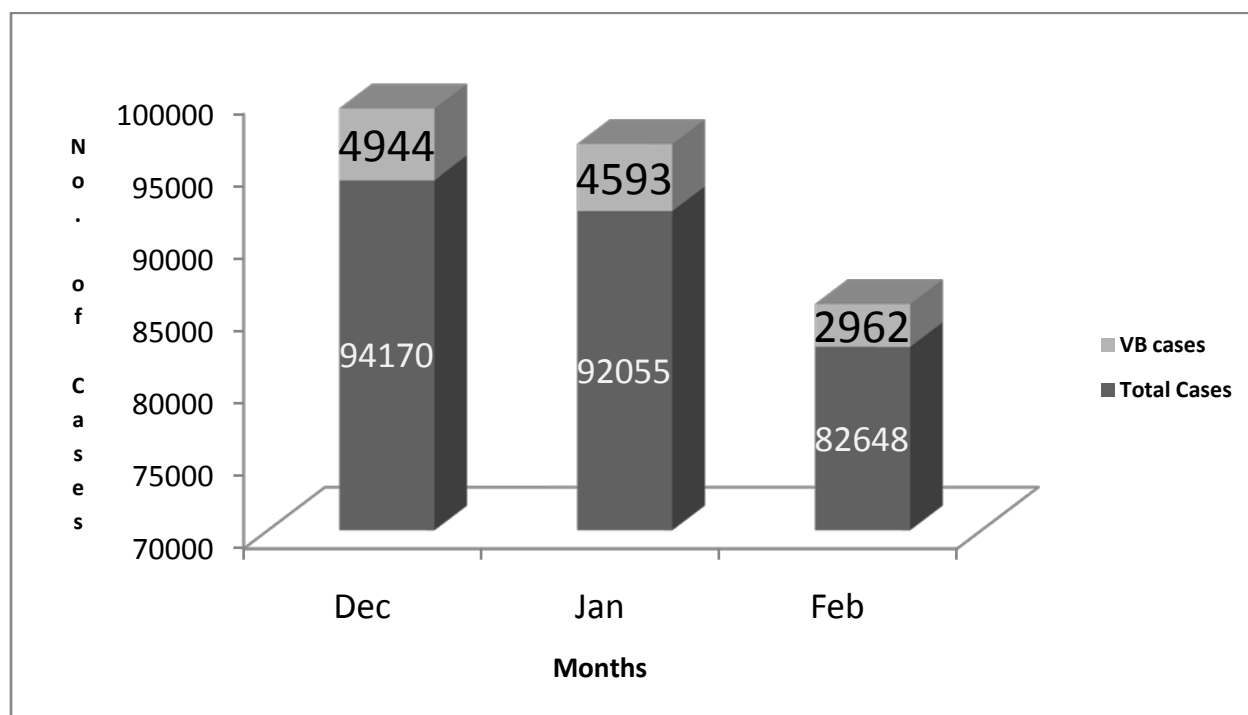


Fig.7 Trend of Vehicle Busy in A.P

Vehicle Busy in A.P has almost reached acceptable level (3%) from 5.3% in December to 3.6% in February. Few changes would suffice to bring VB under control in A.P.

Selection of Districts for the purpose of study

S.N	Districts	Count	% of total	SN		Districts	% of total
1	<u>VISHAKAPATNAM</u>	<u>1227</u>	10%	13		CHITTOOR	4%
2	<u>RANGAREDDY</u>	<u>1037</u>	8%	14	GUNTUR	484	4%
3	<u>EAST GODAVARI</u>	<u>1002</u>	8%	15	ANANTAPUR	451	4%
4	<u>MAHABUB NAGAR</u>	<u>704</u>	6%	16	WEST GODAVARI	382	3%
5	KHAMMAM	690	6%	17	NALGONDA	367	3%
6	VIZIANAGARAM	690	6%	18	NELLORE	328	3%
7	KRISHNA	681	5%	19	MEDAK	306	2%
8	SRIKAKULAM	602	5%	20	NIZAMABAD	279	2%
9	HYDERABAD	537	4%	21	KADAPA	275	2%
10	KURNOOL	526	4%	22	ADILABAD	233	2%
11	WARANGAL	525	4%	23	PRAKASAM	150	1%
12	KARIM NAGAR	524	4%	24	Grand Total	12499	

Table.19 Selection of Districts for VB in A.P

For the purpose of study, as highlighted in the above table 4 districts in A.P.- Vishakapatnam, Rangareddy, East Godavari and Mahaboob Nagar have been selected based on their maximum contribution (32%) to total VB cases in the district.

Selection of Mandals in A.P

Mandal is a subset of a segment. Ambulance allocation is segment-wise. For Vehicle Busy, it would be more precise to go by mandal than segment.

VISHAKAPATNAM				RANGAREDDY			
Sr No	Mandal	Count	% of Total	Sr No	Mandal	Count	% of Total
1	Visakhapatnam	89	7%	1	MALKAJGIRI	48	5%
2	Anakapalli	70	6%	2	RAJENDRANAGAR	48	5%
MAHABUB NAGAR				EAST GODAVARI			
Sr No	Mandal	Count	% of Total	Sr No	Mandal	Count	% of Total
1	Mahabub Nagar	48	7%	1	Kakinada	94	9%
2	Farooqnagar	47	7%	2	Rampachodavaram(Itda)	51	5%

Table.20 Selection of Mandals in A.P

From 4 selected districts, 8 mandals are selected as mentioned above depending on their maximum contribution to total VB of respective districts.

Hourly trend of VB v/s Total cases

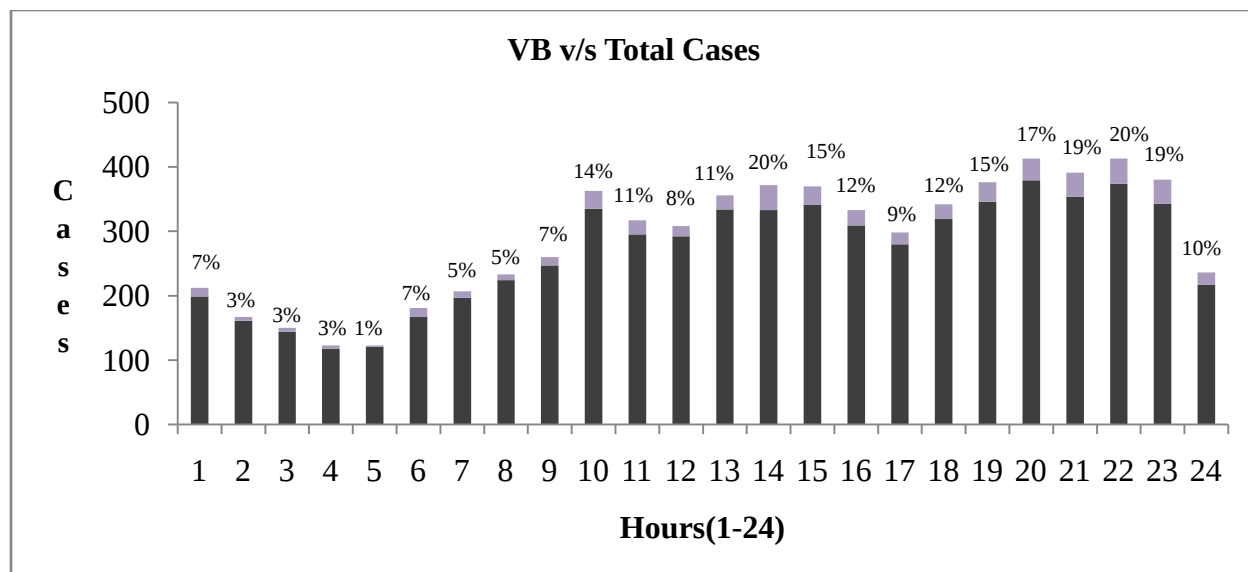


Fig.8 Hourly contribution of VB to total Cases in 8 selected mandals.

Hourly variation of VB is similar to that of total cases with peak hours from 8 to 10 pm. VB is minimum (1%) at 5am and maximum (10%) at 10 pm.

Mandal-wise Hourly contribution of VB to total Cases

On seeing in totality the hourly pattern of VB is similar to that of all mandals put together. A stepdown analysis was conducted to find hours giving maximum VB cases for each of 8 segments. The observations made were:

1. VB in Anakpalli is 20% at 11 pm (maximum)
2. VB in Farooq Nagar is maximum at 9 pm (19%). There is only 1 recorded VB case during the entire 3 months from 1 am to 9 am in Farooq Nagar.
3. Kakinada is getting highest VB at around 8 pm (21%). This is also shift change time of Emergency Medical Technician highlighting the possibility of false assigned cases keeping the Vehicle Busy for early completion of Duty.

4. Mahaboob Nagar is giving a very high VB at 11pm (41%)
5. One of the reasons for high VB cases during these hours is that total cases are also high for respective mandals at these hours.
6. It is also possible that follow-up at VB Desk is not happening properly during this time. Ideally once there is no ambulance available to take patient, the case is transferred to VB desk from where continuous follow-up of nearby atleast 3 ambulances is done and patient is updated with this information continuously. As and when the vehicle becomes free, ambulance closest to the scene is assigned the case.

Analysis of VB Cases from 1 am to 6 am

1. Out of 46 VB cases from 1 am to 6 am, data of previous cases is available for only 10.
2. Out of 46 VB cases, 12 were from Anakpali and Kakinada, 8 were from Mahabub Nagar, 5 were from Malkajgiri and Vishakhapatnam, 3 from Rampachodavaram and 1 from Farooq Nagar. Total EM count is also high during these hours at Anakpali & Kakinada
3. All 7 previous cases in Anakapali were taken in King George hospital. In complete 24 hrs out of 38 VB cases from Anakapali, around half (20) cases are taken to KGH.

Difference between Admit to base time and Assign to admit time

The above shows a difference between 2 cycle times: 1) Time from assignment of case to the ambulance to admission of victim in the hospital. 2) Time taken by ambulance to reach base location after admitting the victim in hospital. Ideally there should not be any difference in duration of these 2 cycles and if any, then the previous one mentioned should be greater than the latter. On calculating difference between 2 cycles for 173 previously assigned cases to VB cases for the respective ambulances following was noted. Due to data challenges from IT department, data pertaining to only 173 cases was available.

S. No	Diff between Ad to B time and B Assign to Admit time (hh:mm)	Time of Case	Mandals	EMT Id
1	1:36	16:27	ANAKAPALLI	6876
2	0:43	21:14	ANAKAPALLI	6599
3	1:36	15:28	ANAKAPALLI	6876
4	0:28	17:34	ANAKAPALLI	4043
5	0:57	17:31	ANAKAPALLI	12668
6	0:29	15:08	ANAKAPALLI	6248
7	0:42	11:31	RAMPACHOD AVARAM(ITD A)	18143
8	0:42	11:13	RAMPACHOD AVARAM(ITD A)	18143

Table.21 Difference between Admit to base time and Assign to admit time

The above table shows out of 173 cases there were 58 cases in which Admission to Base time was greater than assign to Admit time. Only 8 cases with a significant difference have been mentioned in the table above. The cases are tagged with EMT Id to facilitate EMT briefing on this topic. 6 of the above 8 cases are from Anakapalli mandal and 2 are from Rampachodavaram.

Relationship between Ambulance Downtime and Vehicle Busy:

As per standard GVK EMRI definitions, Ambulance Downtime is time when an ambulance is not on-road for reasons of breakdown, maintenance, scheduled service or equipment shortage.

S.N	District	Mandal	Avr amby dwntime per amby	VB for Mandal
1	East Godavari	Rampachodavaram	5.6 days	15%
2	East Godavari	Kakinada	5.4 days	12%
3	Mahabub Nagar	Mahabub Nagar	4.6 days	8%
4	Mahabub Nagar	Farooq Nagar	6.6 days	10%
5	Vishakhapatnam	Anakpali	18.6 hours	9%
6	Vishakhapatnam	Vishakhapatnam	3 days	10%
7	Rangareddy	Malkajgiri	6.25 days	7%
8	Rangareddy	Rajendra Nagar	7.25 hrs	8%

Table 22: Relationship between ambulance downtime and vehicle busy

There could be a probable direct relation between Ambulance Downtime and Vehicle Busy. The districts having high ambulance downtime could have high Vehicle Busy.

On analyzing the relationship between the 2 in selected mandals, it can be noted from above table that no concrete relationship can be established. As mentioned in the table Malkajgiri has an average Ambulance downtime per ambulance of 6.25 days but has a VB of 7%. In contrast to this Vishakhapatnam has an ambulance downtime of 3 days but a high VB of 10%.

Summary

Un-availed Dispatch

- Selected Districts: Rangareddy, Hyderabad & Warangal (3)
- Segments selected: 13. Detailed Analysis: 3 segments.

Observations

1. Un-availed dispatch cases % has reduced progressively over Dec, Jan and Feb.
2. Peak evening hours of UAD match with those of total cases but not in afternoon.
3. Maximum cases: with Standard Remark- Victim not found, Emergency type- trauma (vehicular); Hoax calls very few compared to total calls.
4. Data challenges: SNR en-route data does not capture all details as per UAD case data.
5. Maximum cases- within 1km radius of ambulance Base location (17%).
6. Majority of the cases (56%) are being closed on the next day.
7. In majority of the cases in selected segments for Emergency trauma (vehicular) and pregnancy related emergency ambulance is not able to reach in acceptable time frame.
8. EROs with Assign time > 5 mins have been highlighted. 10 EROs have taken >= 10 mins to assign a case.
9. Repetition of UAD cases from same no: Wrong tagging of Cases, ERO knowledge poor, problem with EMT behavior. Further scrutiny required for cases with EMT as callers.
10. UAD cases per EMT: Out of 271 EMTs, 4 EMTs have > 50 UAD cases & 10 EMTs have > 40 UAD cases.

Vehicle Busy

- Selected Districts: Rangareddy, Vishakhapatnam, Mahabub Nagar, East Godavari(4)
- Mandals selected: 8 mandals.

Observations

1. VB cases % has reduced progressively over Dec, Jan and Feb.
2. Peak evening hours of VB match with those of total cases but not in afternoon. Peak hours for VB cases vary segment-wise.
3. Data challenges: Previous case data is not available for all cases.
4. In 58 out of 173 previously assigned cases, Hospital admission time to Back to base time was higher than assign time to Hospital admission time of the ambulance.

Recommendations:

Briefing of EMTs from Gandhi, Kukatpally and Hanamkonda to:

1. Call the victim constantly on their way to the scene and inform them about their estimated time to arrive.
2. Instantaneous Case closure of UAD cases: to avoid following Vehicle Busy and occurrence of fake cases.
3. Call in ERC once they have admitted the victim and they are free.

Night time relocation of:

4. Ambulance of Police Station Chodavaram closer to Gosha hospital base location
5. Ambulance of Rural Police station Yelamanchili to Petrol Pump Kasimkota
6. Token of appreciation to EMTs with lowest UAD cases and highlighting EMTs with high no. of such cases.
7. Warning to EMTs responsible for fake UAD cases and further scrutiny on this matter.
8. Discussing with Mahindra Satyam on modifying application of SNR en-route database and standardizing it with that of UAD.
9. Briefing of EMTs from selected segments for VB to call in ERC once they have admitted the victim and they are free.
10. Training to EROs on Geo-knowledge of A.P and proper addition of cases in right category to avoid wrong tagging.
11. Weekly monitoring and appreciation to EROs with least assign time by Team Leaders (TLs).

Monitoring Plan

S.N	INTERVENTION	MONITORING PLAN
1	Constant calling by EMT to victim	Calling callers of cases from 3 segments to check if EMT has called & giving feedback to EMTs on a daily basis
2	Instantaneous Case closure of UAD cases	Reviewing daily dispatches to check for UAD cases & giving feedback to EMTs on a daily basis
3	EMT calling in ERC on VB desk once they have admitted the victim	Tracking Constant calling on a daily basis through VB desk time
4	Night time relocation of Anakpali ambulances	Monitoring if this is reducing VB cases from Anakpali on a daily basis.
5	Token of appreciation to EMTs with lowest UAD and highlighting those with high UAD	Checking if EMT-wise UAD cases has decreased by this in 15 days.
6	Warning to EMTs responsible for fake UAD cases	Checking if EMT-wise UAD cases has decreased by this in 15 days.

ANNEXURE.1

Project: Analysis of Un-availed Dispatch Cases in A.P.

Caller Questionnaire

Sample: Callers of Un-availed Dispatch cases of selected segments in the last 48 hrs

Verbal Consent: Good morning Sir/ Madam, I am calling you on behalf of 108 ambulance services. The information you provide would solely be used for research purposes for the betterment of our service and your identity would be kept confidential.

No	Questions	Caller1				Caller 2	Caller 3	Caller 4	Caller 5
	Incident Id								
1	Did you use 108 ambulance service	Yes / No				Yes / No	Yes / No	Yes / No	Yes / No
2	If yes, how many times you called 108?	1. 1 time	2. >1 times			1 / 2	1 / 2	1 / 2	1 / 2
3	If no, why didn't you use it?								
4	How was ERO's behavior on phone?	1 harsh	2 Soft-spoken	3 Indifferent	4 n/a	1 / 2 / 3 / 4	1 / 2 / 3 / 4	1 / 2 / 3 / 4	1 / 2 / 3 / 4
5	How many times did the EMT call you?	1 0 t	2 1 t	3 2 t	4 3 t	5 >3 t	1 / 2 / 3 / 4 / 5	1 / 2 / 3 / 4 / 5	1 / 2 / 3 / 4 / 5
6	Did EMT	Yes / No				Yes /	Yes /	Yes /	Yes /

	intimate you about time he would take to reach?		No	No	No	No
7	If yes, what was ETA given by him					
8	Did EMT tell you how far he is from the scene?	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
9	If yes, what did					



ANNEXURE.2

Reference Document: Operational Definitions

- ❑ Total Calls Offered : Total number of attended and Unattended calls
- ❑ Total Headcount – ERC : Total number of Emergency Response Officers, TL, SME, 48 hrs follow up, OSD Team on the last day of the month Excluding associates OJT.
- ❑ UAC: Total Calls unattended =>5 seconds (2 Rings) on 108.
- ❑ Effective Calls : Total Number of emergency calls plus Inquiry calls, appreciation calls, follow up calls, response with doctor calls, Service not required calls, IFT calls, Escalation calls, EMT to ERCP calls, caller concern calls, EMT to ERO calls, repeated calls.
- ❑ Ineffective Calls: Total calls answered minus total Effective calls (Prank calls, disconnected calls, silent call, nuisance calls, no response calls, abusive calls, child calls, wrong call, and missed calls.
- ❑ Emergency Calls : Total calls warranting dispatch of Medical, Police & Fire vehicles (As the case may be)
- ❑ Call Response Efficiency : Total number of calls answered in 4 seconds divided by Total number of calls answered as per the Nortel report
- ❑ Avg. ERO Time on a call (AHT) : (sum of Pop up close time minus Pop up open Time for all calls answered)divided by(total calls answered)
- ❑ Avg. ERO Time on EM Calls (AHT) : (sum of Pop up close time minus Pop up open Time for all EM calls answered)divided by(total EM calls answered) (As per ERO Application)
- ❑ Call to Wheel Time (AHT) : (sum of Vehicle assigned time minus Pop up open Time for all EM calls answered)divided by(total EM calls answered)(Excluding Vehicle Busy cases)
- ❑ IFT Calls: Calls related to Hospital to hospital shifting request.
- ❑ IFT dispatches: Ambulance Dispatches to shift patient from one Hospital to another hospital.

- ❑ Exclusive Police Emergencies : In case of emergency where only police dispatch is warranted
- ❑ Total Assigned Cases : Total No of medical Police & fire dispatches (Availed plus Un-availed)
- ❑ Availed cases: Total Number of beneficiaries transported through medical dispatches including cases where Victim refused treatment Admitted in hospital, First aid provided, Victim Expired before ambulance Reach, Victim condition stable.
- ❑ Unavailed Dispatch (UAD): Dispatches where ambulance could not find or serve the patient.
- ❑ Service Not Required (SNR) Dispatches: When caller calls for cancellation of dispatch request after assignment is done. Ambulance may or may not have started from Base Location.
- ❑ Less than 1 KM travel: Any Ambulance travelled less than 1 km after assignment and the caller refuses the service will be considered as SNR and vehicle to be deassigned.
- ❑ Total Calls Answered : Total calls answered by Emergency Response Officers
- ❑ Vehicle Busy Cases : Cases where ambulance cannot be assigned due to ambulance being busy, already on a dispatch for another Emergency and the caller denies the service because of the distance for next available ambulance
- ❑ % Attendance : Total headcount Present Divided by Total headcount rostered (Excluding Absconding cases)
- ❑ Total Head count Rostered: Total Head count planned out of total head count available after considering week off, Comp off, Planned Leaves.
- ❑ Technology Uptime : Sum of Total Uptime (Application, Hardware, IT support system including Internet (LAN) divided by Total number of hours for a given month respectively
- ❑ Total No of Ambulances : Total number of ambulances registered (On road, Off Road plus Back up Ambulance
- ❑ On-road: Total number of ambulances available for dispatch plus total number ambulances kept as Back up.

- ☐ Off-road : Total number of ambulances unavailable for dispatch due to technical or non technical reasons
- ☐ Cases provided with Online Line Medical Direction (OLMD) : calls where Online medical direction was solicited by EMT and provided by ERCP
- ☐ Call to Scene time (Total) : Sum of ((scene reach time minus Pop up open time) for all availed & unavailed cases)
 - ☐ Call to Scene time (Urban) : (Sum of ((scene reach time minus Pop up open time) for all availed and unavailed cases) in case the incident location is Urban)
 - ☐ Call to Scene time (Rural) : (Sum of ((scene reach time minus Pop up open time) for all availed and unavailed cases) in case the incident location is Rural)
 - ☐ Call to Scene time (Tribal) : (Sum of ((scene reach time minus Pop up open time) for all availed and unavailed cases) in case the incident location is Tribal)
- ☐ Ambulance Uptime : (Sum of Total ambulance (On road) Uptime hours) divided by (Total number of hours multiplied by no of ambulances for a given month respectively)
- ☐ Failed Transport : Summation of Un-availed Dispatch and Service Not Require (SNR) - Enroute dispatches
- ☐ Average No. of calls per ERO : Total Calls answered divided by total head count of ERC (Core Role)
- ☐ Productivity of ERO : a. average talk time out of the total login hours (from Nortel)
 - b. Average no. of calls handled by ERO.
- ☐ Total Productive Minutes Logged in by Associates per day = Total Productive Minutes Logged in by Associates for the month ÷ (Total Number of days for the month + All Leaves – Planned Leaves – Week Offs – Compensatory Offs which is planned in advance); Planned Leaves means leaves requested for 25th Day of the Month for the leaves requested for the following month; Roster needs to be prepared for the entire month and shifts need to be changed monthly only for associates to adjust to the sleep cycle

- ❑ Avg. Ambulance Trips/Day : Total number of availed plus unavailed Plus SNR per day divided by total number of ambulances (Including On road, Off Road, Back up ambulances)

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