Final Report
On

AMBULANCE SERVICES
AT
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For

P&C DEPARTMENT, GOVT. OF ODISHA
ODISHA SECRETARIAT

by

NATIONAL PRODUCTIVITY COUNCIL

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1.0 INTRODUCTION

Although there have been isolated attempts to address emergency care in India, these measures could not and address all kinds of emergencies. The existing service levels were primitive and suffered from operational deficiencies of single number contacts, accreditation of ambulances, education and training standards for paramedics for the pre-hospital care.

In India, about 69% of the population lived in rural areas in 2011. According to the national census of 2011, the number of rural villages in India is 540,867. Out of these, only 22% of the rural population lives within 5 kilometers from the nearest town; 28% are in a range of 5 to 10 kilometers from a town; and the majority of 50% are located 10 kilometers from the nearest town (Census, 2011). Although the number of poor people living in urban areas is growing, poverty remains a predominantly rural phenomenon. It was in this context that the Government of India (GOI) initiated the National Health Mission (NHM). Access to quality health care was recognized as an important factor in well-being, productivity, addressing poverty and overall economic growth. The NHM therefore took on the challenge of infusing appropriate financial, technical and managerial inputs to strengthen health care delivery. The 108 emergency services emerged as a remedy to fill the gap in the Indian health care delivery system. The aim of this service is to provide quality emergency care referral transport service within the shortest possible time during emergency.

1.1 Objective of the Study:

The objective of evaluation of the referral transport service or the ambulance service is as below:

- To understand present level of service delivery by the various ambulance services (108 ambulance services) offered at the study locations.
- To identify the gaps in the service quality in terms of reliability, timeliness.
- To understand the concern of the beneficiary towards the effectiveness and quality of service.
- To analyse the present service and to propose policy intervention for improving the quality and effectiveness of ambulance service.

2.0 AMBULANCE SERVICE IN ODISHA

2.1 108 SERVICES

The Government of Odisha has initiated comprehensive pre-hospital emergency medical with introduction of a fleet of ambulances to cover the entire State in a phased manner in coordination with NHM. The aim is to provide Emergency Ambulance Service free of cost to the people of Odisha. This will facilitate an integrated and comprehensive emergency health care management in the State providing high-end ambulance transportation system from the doorstep of the patient to the appropriate care in a hospital. The aim is to provide quality emergency care transport within the shortest possible time during emergency, ensure delivery of quality emergency care across the chain of services with a proper emergency management system. This fleet comprises of both 'Basic Life Support' (BLS) and 'Advance Life Support' (ALS) ambulances. The care of the acutely ill or severely physically injured patient occurs on a broad range.

To minimize morbidity and mortality, emergency care should begin at the scene of the incident and end in a definitive care facility. Prompt and effective pre hospital transport represents a critical link in this sequence of care.

3.0 STUDY METHODOLOGY:

This study is based on secondary data collected from OEMAS (Odisha emergency medical ambulance service) and primary data from citizen's prospective for the 108 ambulance service of Odisha.

4.0 OPERATION OF 108 AMBULANCES (Under OEMAS Odisha Emergency Medical Ambulance Service):

Emergency service providers are supposed to locate ambulances such that in case of emergency patients can be reached in a time-efficient manner. Two fundamental decisions and choices need to be made real-time. First of all immediately after a request emerges an appropriate vehicle needs to be dispatched and send to the requests' site. Secondly Ambulances, when idle, are to be located at designated waiting sites. Hence after having served a request the vehicle needs to be relocated (i.e. its next waiting site has to be

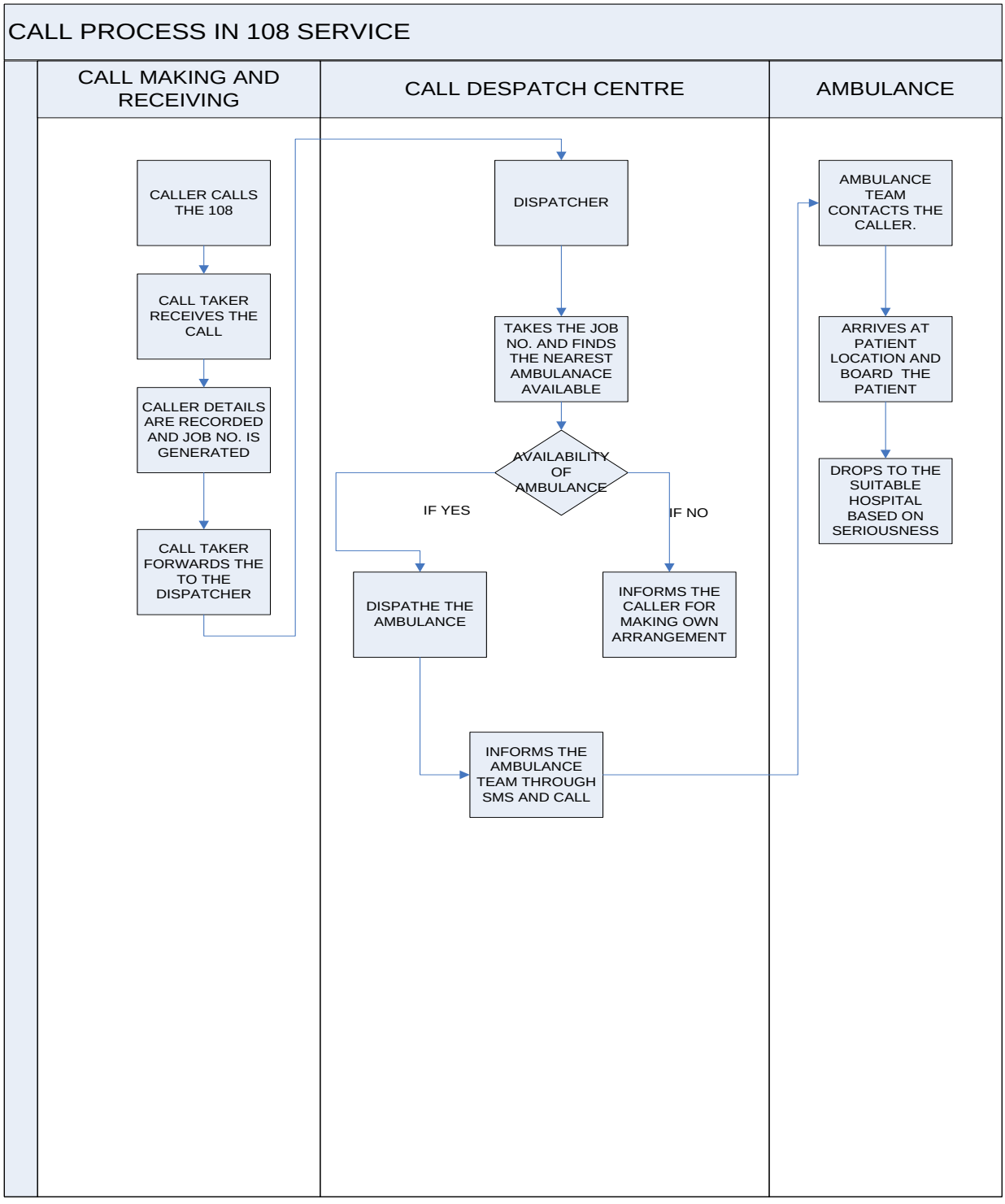
chosen). For a close match to reality, time-dependent information for both traveling times and the request volume will be considered explicitly. The ambulances are fitted with a Geographical Information System (GIS) and Geographical Positioning System (GPS) to locate the site of emergency and to monitor the availability and mobility of the vehicle near the site of emergency. The ambulance has well trained personnel (Emergency Medical Technician) to provide pre-hospitalization care during transit. Advance Life Saving (ALS) ambulances are fitted with defibrillators and ventilators for handling the emergency cardiac cases. Depending on the type of emergency, opt for either of the two types of ambulances available. One is a Basic Life Support (BLS) ambulance and an Advanced Life Support (ALS) ambulance also called a Cardiac Care Ambulance. A basic life support ambulance is equipped with life support equipment like an oxygen cylinder, BP monitor and stethoscope. This type of ambulance can be used for emergencies that are not very grievous or when the patient can be transported to the hospital quickly. The other type of ambulance is the Advanced Life support Ambulance or the Cardiac care ambulance. This ambulance is fitted with advance life support machines such as defibrillators (a machine used to restart the heart), ECG machine (used to keep a check on the heart rate of a person), Ventilators, Oxygen cylinders, Pulse oxymeter (used to check for the amount of oxygen in the blood), Resuscitation kit, suction machine, Nebulizer and BP apparatus. This kind of ambulance can be used in cases where the patient is either unconscious, has had a heart attack or is a known patient of heart disease.

The number 108 is a toll-free number and can be dialled from any phone, be it a mobile phone or a landline, at the time of an emergency, without any prefix or suffix. The centralized Emergency Centre at IDCO tower, Bhubaneswar coordinate between the Despatch Officer and the Emergency Medical Technician (EMT) for getting guidance during transit. When an emergency is reported through 1-0-8, the receiver gathers the required basic information and dispatches appropriate services. Basic information obtained includes:

1. Where the call is sited from (District/Block /Town/ exact location/landmark)
2. The type of emergency
3. Number of people injured and the condition of the injured
4. The caller's name and contact number – for location guidance

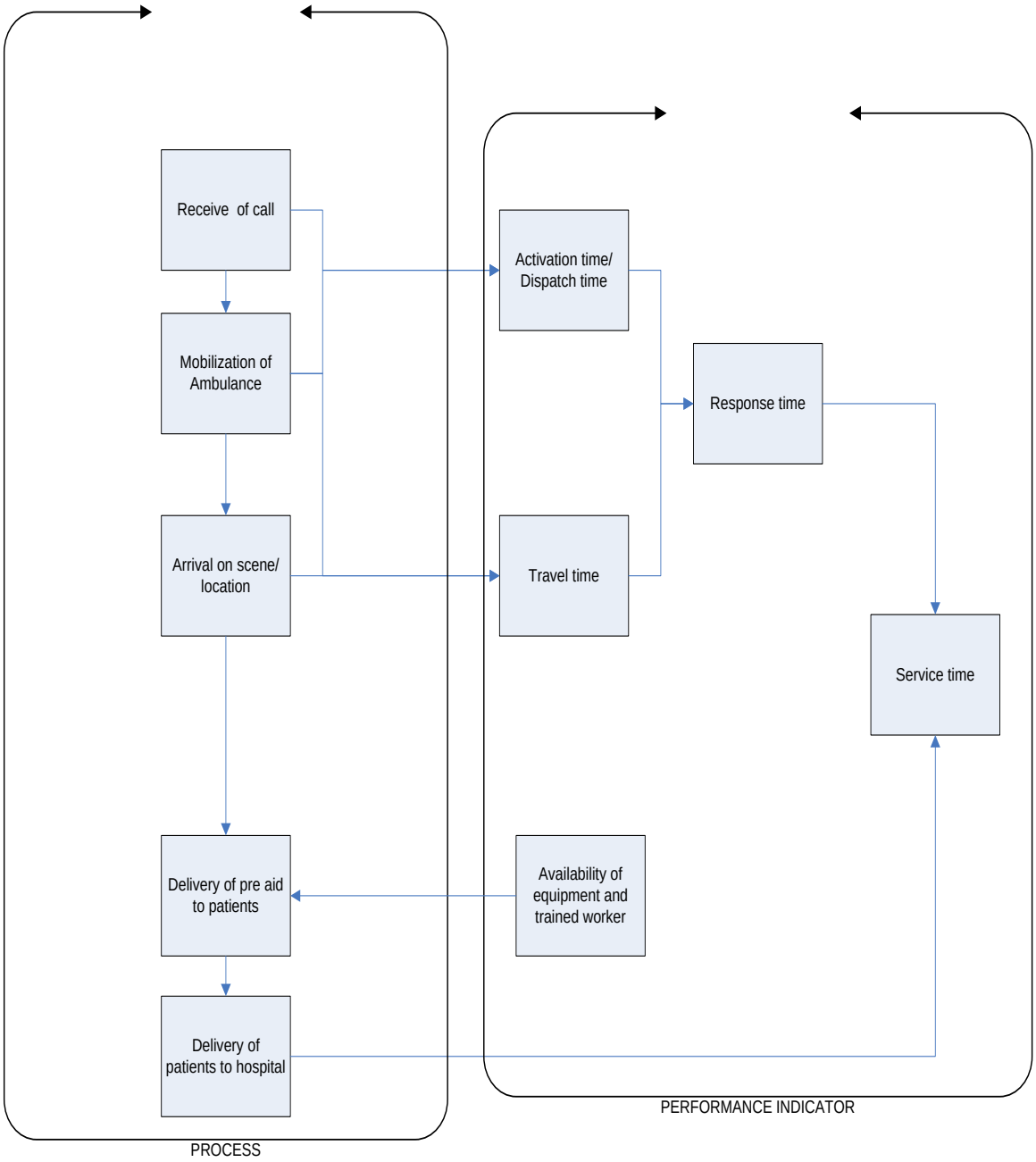
Despatch officer assigns nearest appropriate ambulance (ALS/BLS). The paramedics manning “108” ambulance are trained with a course including the modules on Basic Preparatory course, Refresher Emergency Management Technician (EMT) training program and Long term EMT program. A Paramedic is trained professional who extends help to the victim during the transit from site of emergency to hospital where doctor will take over the care of the victim. The patient is handed over to the appropriate hospital for further treatment.

Figure 1: Ambulance Call Management process



4.1 Performance Indicators:

Figure 2: Classification of performance indicators



*The **Activation Time/Dispatch Time (A)** is the time from the emergency call to ambulance dispatch/allocation.*

*The **Travel Time (B)** is the time from allotting ambulance to arrival on scene/location of incident.*

*The **Response Time (C)** is defined as the elapsed time from the point that a call for emergency ambulance response is received by an ambulance communication service to the arrival of an ambulance.*

$$C = A + B$$

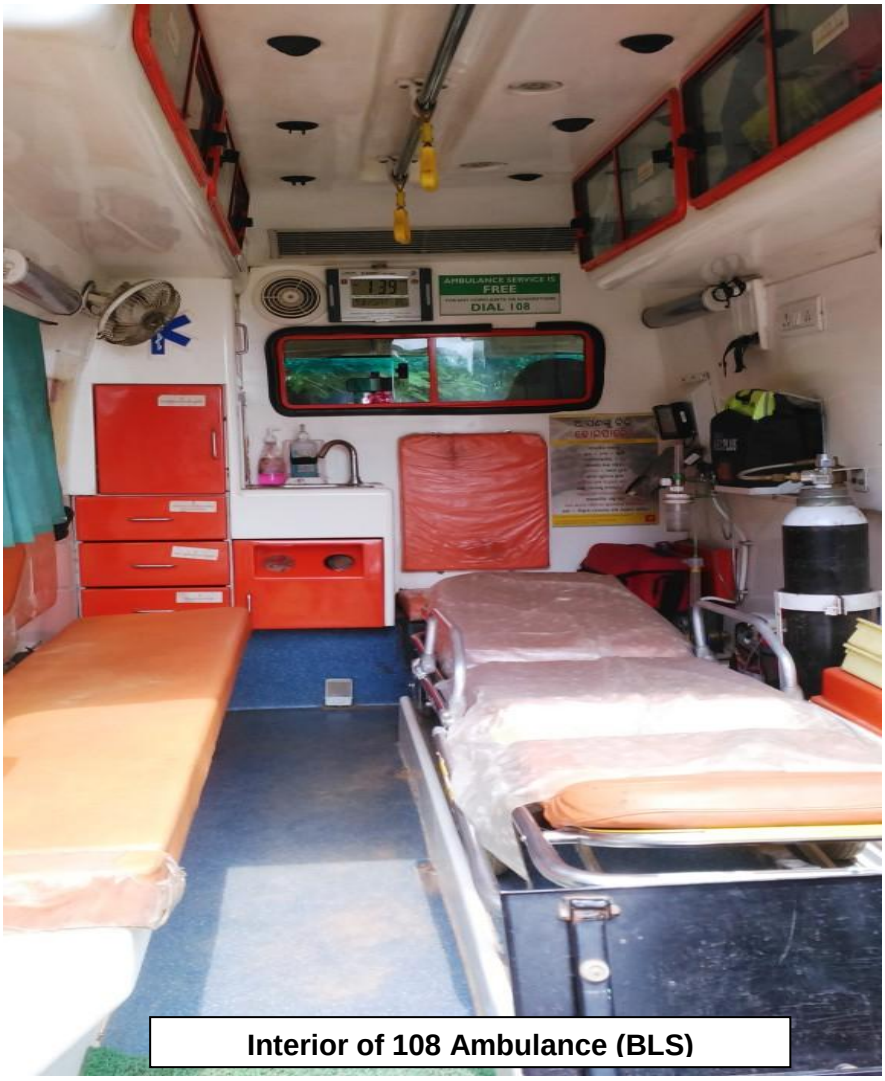
*The **Service Time (D)** is defined as the elapsed time from the time of call to the patient condition report is acknowledged i.e. the service time is the sum of response time and time elapsed for return.*

*The **Utilization Time** is the elapsed time from ambulance allotment to the completion of the trip.*

The ambulances were positioned in a manner that each ambulance has to cover an area of 30 Kms in radius and caters to a serving population of 1 lakh.

The average response time of **20 minutes for urban**, **25 minutes for semi-urban** and **35 minutes for the rural areas** has been kept as performance parameter for the service provider by NHM, Odisha. However the response time can be made more flexible depending upon the geographical terrain where the average time may vary from 45 to 60 minutes. **(Source: NHM, Odisha)**

108 AMBULANCE

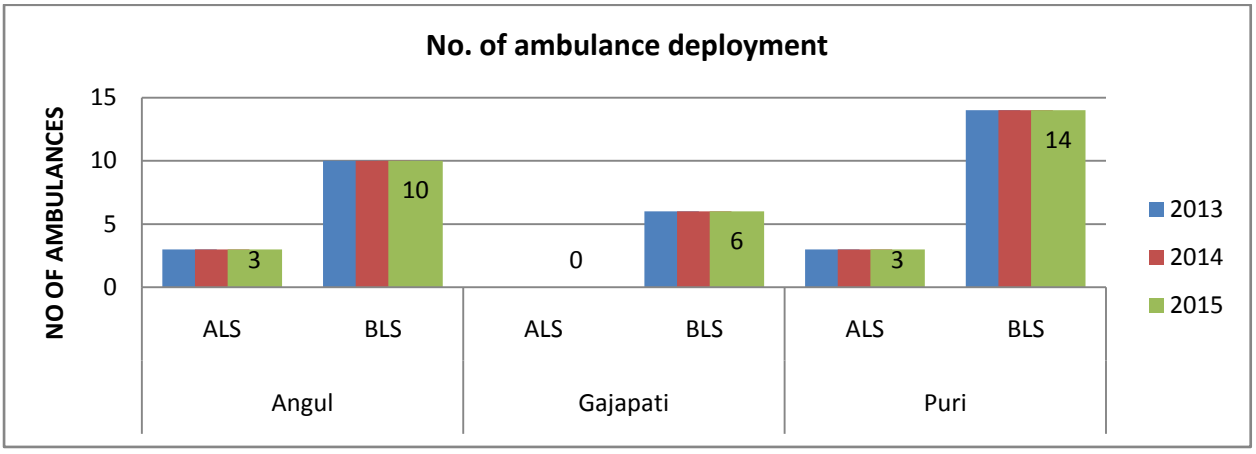


Interior of 108 Ambulance (BLS)

5.0 OBSERVATIONS:

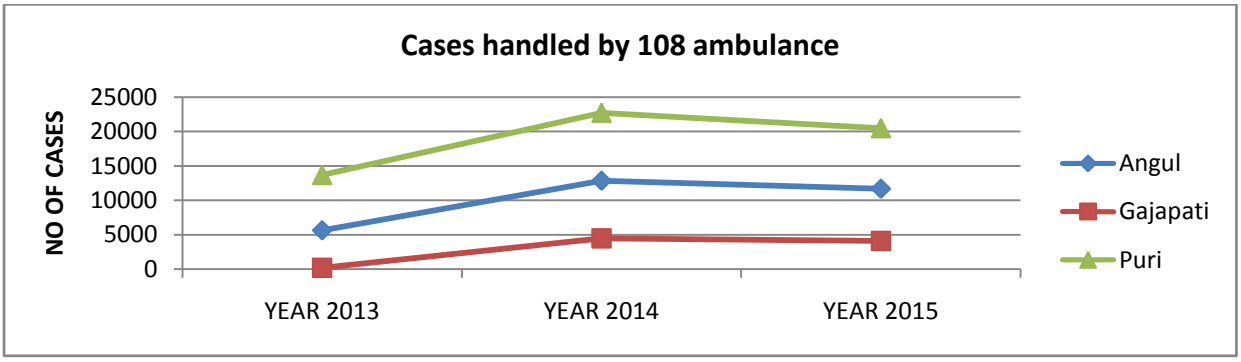
5.1 No. of ambulance deployment

Figure 3 : Deployment of ambulance (in nos.)



(Source: data from the District Health Administration)

Figure 4: No. of ambulance cases trend



(Source: data from the District Health Administration)

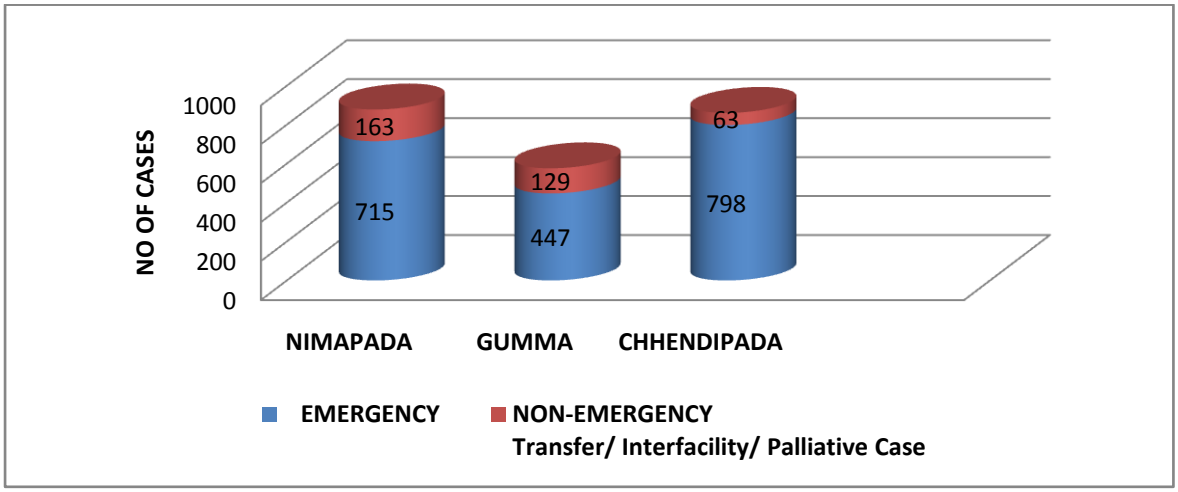
Comparing figure 3 and figure 4, it was observed that the deployment of ambulance number has not increased while the no. of cases handled by ambulances is on an increasing trend. There is no provision of ALS in Gajapati district while the ALS is available in the other two districts.

6.0 PERFORMANCE PARAMETERS:

Table 1: Performance Parameters Comparison Block Wise

PARAMETERS	Statutory Requirement under NHM	Achieved in Various blocks		
		Gumma	Chendipada	Nimapara
Dispatch time	1:30 minutes	1:40 minutes	1:41 minutes	1:45 minutes
Average response time: Urban Semi-Urban Rural	 20 minutes 25 minutes 35 minutes	 29:12	 26:34	 25:37

Figure 5:108 Service loads per ambulance (Service Wise in 2015-16)



(Source: data from the District Health Administration)

6.1 Gumma:

- There is provision of 1 BLS ambulance at Gumma and no ALS is available.
- Number of trips completed in a year is 1835.5 with covering a total distance of 52397 km with coverage of an average of 143 kms per day.
- Range of operation-(1-314km)
- **Activation/Dispatch time -00:01:40 minutes, Response time-00:29:12 minutes, Service time-01:41:00, Utilization time-03:06:28.**
- Vehicle provided to CHC Gumma is based on WHO norms, 1 per 1 lakh population. But the considering the hilly and steep regions including some inaccessible locations, it is difficult to reach the patients during all seasons. The road connectivity between the different service delivery points is also not conducive for the ambulance.
- Vehicles are somehow not suitable for hilly and inaccessible regions due to lower ground clearance and lack of back-wheel drive for smooth serviceability.
- Average response time is 29 minutes in Gumma CHC, which meets the preliminary mandatory requirement set by NHM but it is ironical to provide pre hospital support in that period of time. With benchmarking of the other states it's observed that As standard for most of the developed states is below 15 minutes.

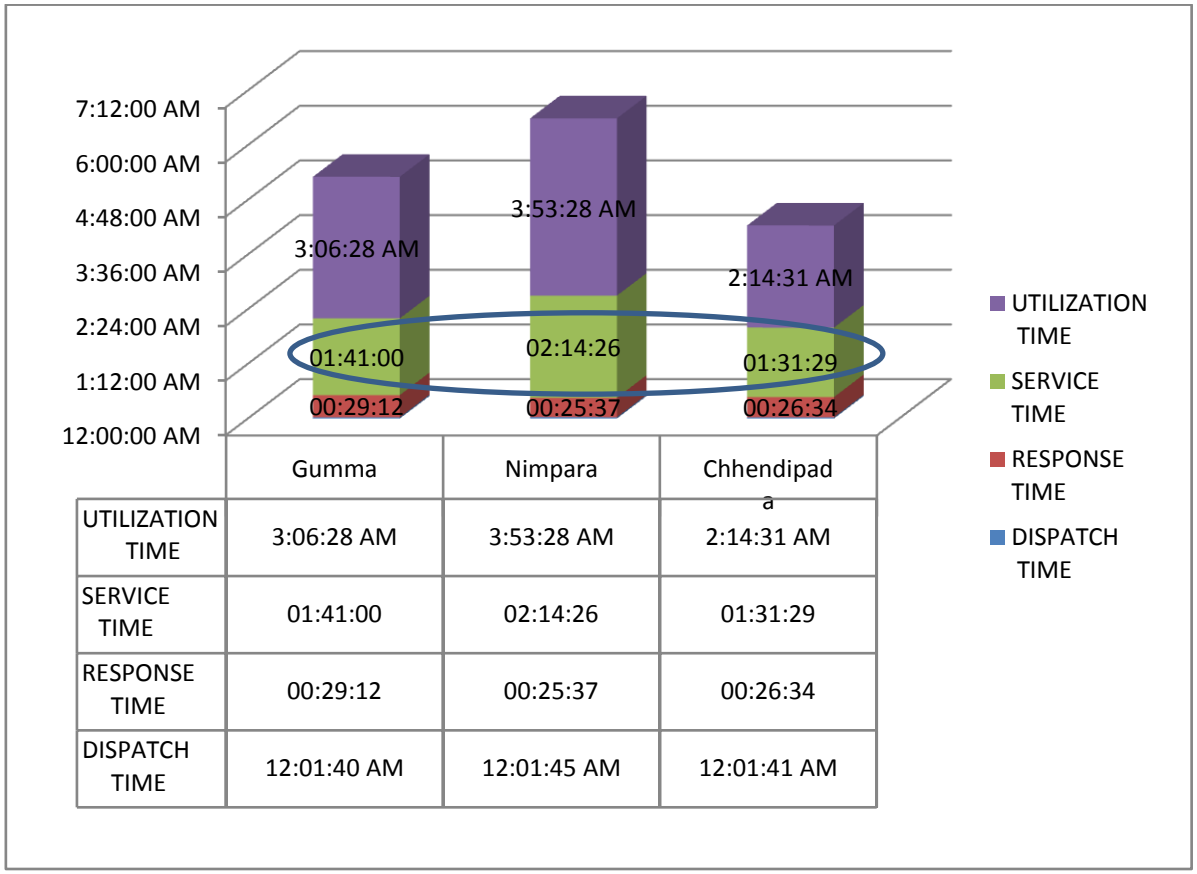
6.2 Chhendipada:

- There is provision of 1 ALS & 1 BLS ambulance each at Jarapada PHC and Chhendipada CHC.
- Number of trips completed is 3819.5.
- Total distance travelled in the year is 111911 km
- Range of operation-(1-299 km)
- **Activation/Dispatch time -00:01:41 minutes, Response time-00:26:34 minutes, Service time-01:31:29,Utilization time-02:14:31**
- Road connectivity is uniform throughout the year and there is almost no problem in service of ambulance.
- Vehicles are suitable for interior and rural regions for smooth serviceability.
- Average response time is 26 minutes in the block, which meets the preliminary mandatory set by NHM but it is ironical to provide pre hospital support in that period of time as standard for most of the developed states is around 15 minutes.

6.3 Nimapara:

- There is provision of 1 ALS & 2 BLS ambulances at Nimapara CHC, Balanga PHC & Charichhack CHC respectively.
- Number of trips completed is 6580.75
- Total distance travelled in the year is 192814 km
- Range of operation-(1-175 km)
- **Activation/Dispatch time -00:01:45 minutes, Response time-00:25:37 minutes, Service time-02:14:26, Utilization time-03:53:28.**
- Vehicles are suitable for interior and rural regions for smooth serviceability.
- Average response time is 25 minutes in Nimapara, which meets the preliminary mandatory set by NHM but it is ironical to provide pre hospital support in that period of time as standard for most of the developed states is below 15 minutes.

Figure 6: TIME PARAMETERS COMPARISION



	Gumma	Nimpara	Chhendipada
UTILIZATION TIME	3:06:28 AM	3:53:28 AM	2:14:31 AM
SERVICE TIME	01:41:00	02:14:26	01:31:29
RESPONSE TIME	00:29:12	00:25:37	00:26:34
DISPATCH TIME	12:01:40 AM	12:01:45 AM	12:01:41 AM

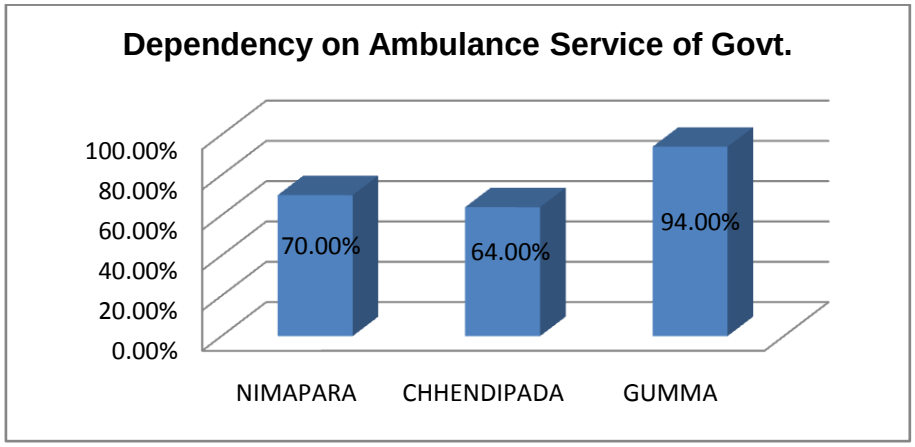
Source: OEMAS Odisha

7.0 BENEFICIARY ANALYSIS:

7.1 Dependency on Ambulance Service

From the **Figure 7**, it's understood that, in Gumma, there is sole dependency on the 108 ambulance service; however the same is less in the other 2 blocks of the study. In Nimapara and Chendipada block, due to better socio-economic status of the residents', they utilize own conveyance during emergency. In Gumma, the road connectivity is poor and there is no availability of the public/ private transport service, this compels the beneficiary for depending on the sole ambulance/ referral transport service provide by Govt. In Nimapara and Chendipada, the road connectivity is improved, with availability of Public/ Private transport facility enables the beneficiary to avail the alternative mode of transport. The availability of Private hospitals/ private ambulance also provides an alternate mode of transport during emergency.

Figure 7: Dependency on Ambulance Service of Govt.

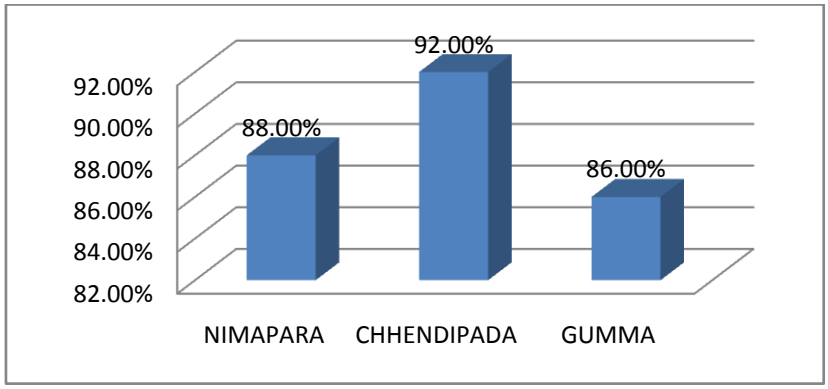


(Source: Primary data FGD with the beneficiary)

7.2 Connectivity to Call Center:

Connectivity to the state ambulance call center is crucial for availing the 108/102 ambulance service, as the beneficiary had to lodge a request for the onward deployment of ambulance. However the same is not so appreciated by the beneficiaries in Gumma and Nimapara Block. 12% and 14% of the beneficiaries have reported that (Figure 8), they encounter problem/ connectivity issue for lodging the request and/or indenting for ambulance. During the study, it was also understood that many of the areas under Gumma block have neither provision of mobile phone connectivity nor have facility of landline, thus the beneficiary encounter problem in registering their request for ambulance. In these cases ASHA/ AWW visits the nearby village/ center for connecting to the call center for requisitioning the ambulance service.

Figure 8: Connectivity to the operator (Call Center)

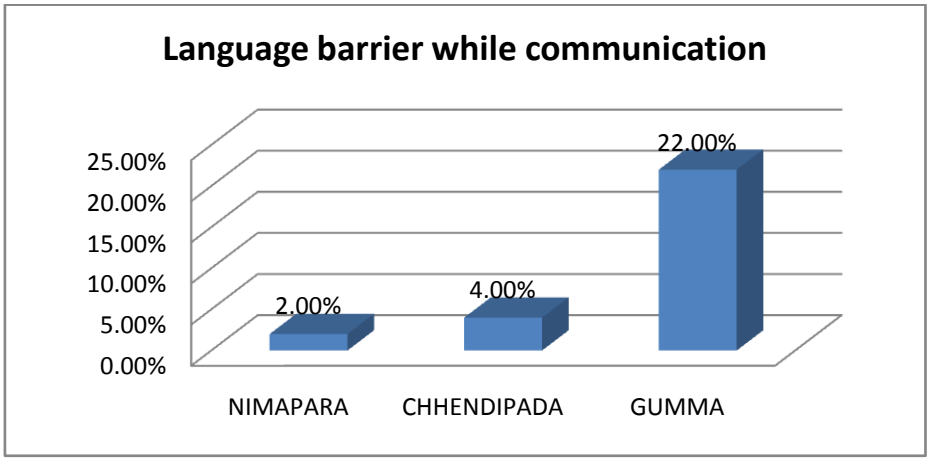


(Source: Primary data FGD with the beneficiary)

7.3 Language barrier during communication:

The figure 9 reveals that 22 % of the respondents in Gumma block encounter problem in conveying the message, while 2% in Nimapara and 4% in Chendipada blocks. The language has become a major issue while making communication with the Centralized call center by the beneficiaries of Gumma Block of Gajapati district. The block being tribal dominated, thus it becomes difficult for the users to communicate the same to the centralized call center.

Figure 9: Language barrier while communication

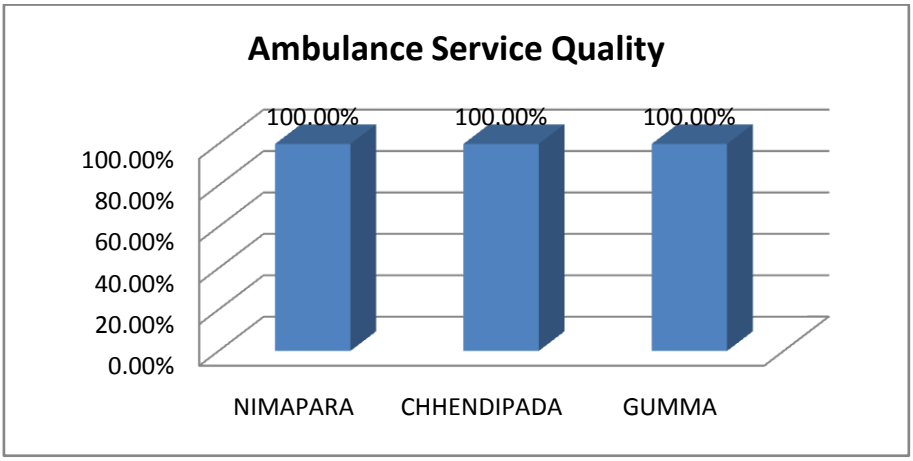


(Source: Primary data FGD with the beneficiary)

7.4 Quality of Ambulance Service:

It's observed that the ambulance service quality is appreciating in all the 3 blocks of the study. 100% of the respondents have opined that they are satisfied with the service quality and the comfortability of the journey. The details are depicted in Figure 10 of the report.

Figure 10: Ambulance Service Quality

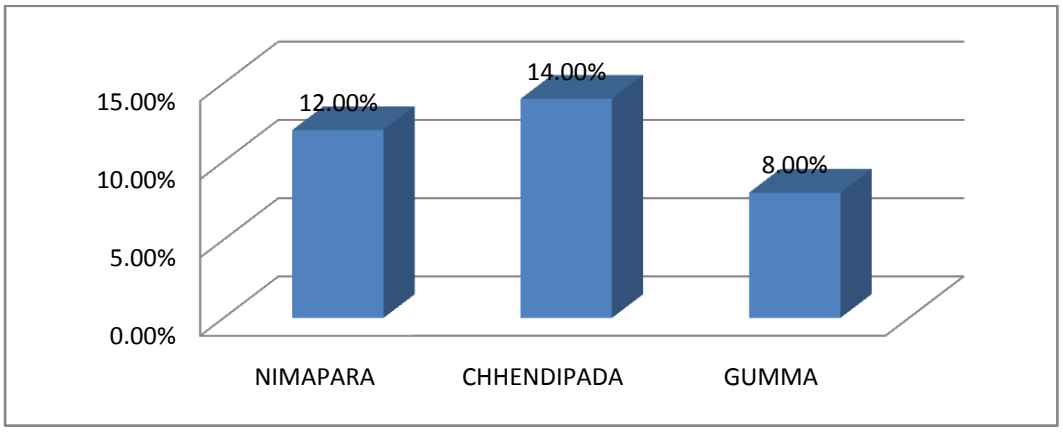


(Source: Primary data FGD with the beneficiary)

7.5 Pre Counseling/ Medical advice for the patients:

It's essential to provide advice in mitigating to the emergency before the availability of the ambulance at the casualty/emergency location. Presently, the same is not systematically practiced by the on-board EMT (Emergency Medical Technician). The Figure 11 depicts, less than 15% of the people in all the three blocks opined that they have received advice from the Ambulance team on the phone before arrival of the ambulance to tackle with the emergency situation.

Figure 11: Pre Counseling/ Medical advice for the patients



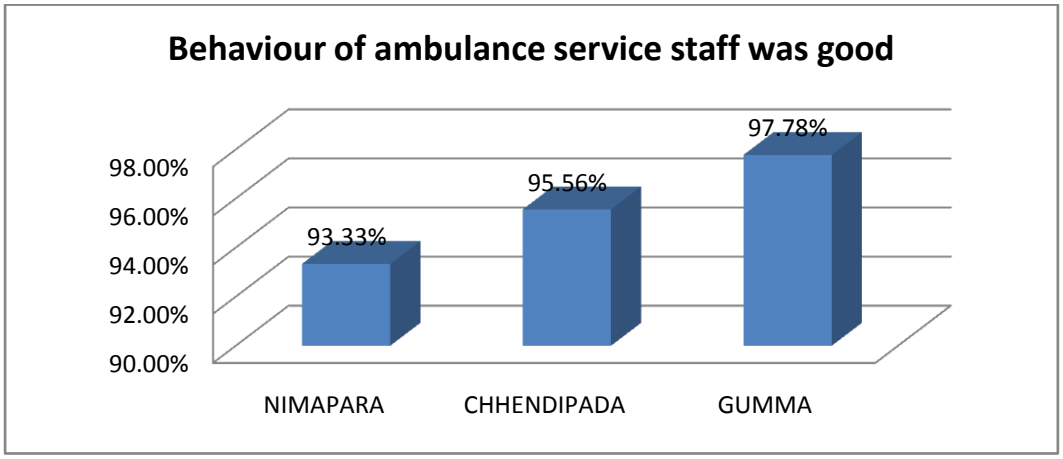
(Source: Primary data FGD with the beneficiary)

7.6 Behavior of Ambulance team:

The FGD with the beneficiary reveals that more than 90% of the beneficiaries have reported that they are satisfied with the behaviour of the ambulance team. While rest 10% of the respondents have opined that the ambulance team is rudely behaved. The incidence of poor

behaviour of the ambulance team is highest in Nimapara block with 7 % of the respondents and lowest in Gumma block with only 2%. The detail of the beneficiary response is in Figure 12 of the report.

Figure 12: Behavior of Ambulance team

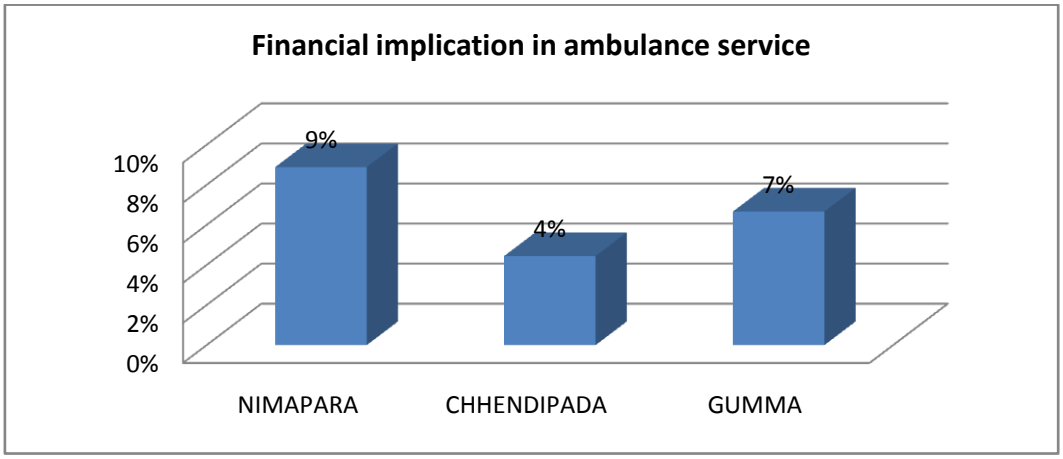


(Source: Primary data FGD with the beneficiary)

7.7 Financial implication in ambulance service:

The Figure 13 infers that many of the beneficiaries have shown their concern about being financial harassed by the ambulance team, the same is highest in Nimapara Block with 9% of the beneficiaries have reported about being asked money for their transport by govt. ambulance service and the same is lowest in Chhendipada Block with response of 4%. The beneficiaries responded that that certain cases the financial implication is meager and the same is asked for as tips which the beneficiary voluntarily pays as an obligation towards the service provider. However in certain cases the team forcefully exploits the beneficiary for money failing which they intentionally delay the service.

Figure 13: Financial implication in ambulance service

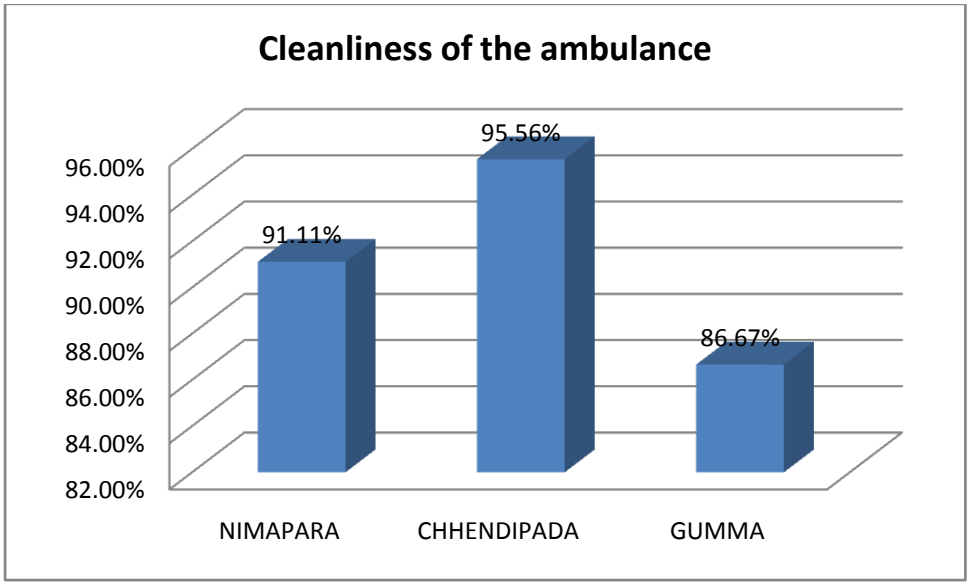


(Source: Primary data FGD with the beneficiary)

7.8 Cleanliness and hygienic of Ambulance:

Most of the respondents have opined that the ambulance remains clean and hygiene. However the same is poorly appreciated in Gumma Block as compared to the other two blocks with a response of 13% have shown their concern about the cleanliness and hygienic of the ambulance. It can be inferred from the Figure 14 hat, 95.56%, 97.78% and 93.33% of people are satisfied with the cleanliness inside the Ambulance in Nimapara, Chendipada and Gumma blocks respectively.

Figure 14: Cleanliness of Ambulance



(Source: Primary data FGD with the beneficiary)

8.0 SWOT ANALYSIS:

8.1 Strengths:

- Available 24 hours a day, seven days a week
- Strong reputation and positive public image
- Mobile healthcare provider
- Periodic performance in call taking standards

8.2 Weaknesses:

- Higher than average costs
- Unique-professional workforce (limited skill mix of staff)
- Staff satisfaction at ground level.
- Environmental impact.

8.3 Opportunities:

- Urgent, unscheduled care provision.
- Improving outcomes and experience.
- Diagnostic technology.
- Managing demand in the whole health economy.
- Releasing cost improvements in the whole health economy.
- Community cohesion (social responsibility whilst supporting public health)
- General health Management

8.4 Threats:

- No up gradation in ambulances.
- Competition from alternative providers.

Ambulance service at Blanga (Nimapara Block) on 03/08/2015

9.0 RECCOMENDATION AND CONCLUSION

- It is terms like 'The Golden Hour' and the 'Platinum Ten Minutes' that imply the importance of Emergency Medical Services (EMS) all over the world. It is a well-accepted fact that a patient who receives basic care from trained professionals and is transported to the nearest healthcare facility within 15-20 minutes of an emergency has the greatest chance of survival where as service time in all the blocks is more than one and half an hour. So, there is urgent need to reduce the service and response time by proper planning and deployment of ambulance service and also strengthening the referral service.

Delay in Activation/ dispatch time:

- At state level instruction should be given for improvement of the call handling system and improving the activation time of ambulance.

Delay in Response Time, Service Time, Utilization time:

- Necessary instruction should be made for quick availability of the ambulance which minimizes the time. Multiple ambulance deployment point in the remote and in accessible areas may be planned for timely availability and overall coverage of ambulance service.

Poor maintenance of Ambulance:

- At state level instruction should be given with Specific norms for maintenance of ambulance deployed in different geographical terrains.
- Specific norms for fuel consumption should also be developed for ambulance deployed in different geographical locations.

Non-availability of appropriate/ suitable vehicle:

- Instruction should be given for deployment of suitable vehicle depending upon the geographical locations.

Financial Harassment:

- The staffs of Ambulance should be sensitized on people's motivation. Customer feedback mechanism should be developed for monitoring the service failure in the ambulance service.

Poor monitoring and MIS at dist. Level:

- A district performance monitoring cell should be constituted for monitoring the MIS and service quality of ambulance deployed at various locations of the district.

No record on service failure/ non availability of ambulance service:

- Record management system should be developed for understanding the various service failure modes and addressing the same by fixing the responsibility including accountability over the concerned staff.

Management of Ambulance Service:

- The call centre team at state level or on Board EMT should be sensitized for providing pre ambulance support/ pre ambulance medical advice to the beneficiaries.
- A periodic random post service feedback evaluation should be made for understanding the quality of ambulance service and status of the patients.

- Provision should be made for making sub call centers/ dedicated line for attending calls from the tribal districts with engagement of executive versed in tribal language.
- Decreasing the distance covered by ambulances can also improve the efficiency, effectiveness and impact of the EMS. Currently, Odisha follows a norm of one ambulance covering a radius of 30 km and 1 lakh population. This means that it takes 30 minutes or more to locate the spot and reach the patient. But currently, response time is below 30 minutes in all the three blocks. Need to improve the 108 ambulance services and care continuum (pre-hospital, Emergency medical care and post emergency care in the hospital), increase the density of ambulances (1 ambulance per 50,000 people), and set up emergency medical centers in hospitals.
- Quality Assurance process must be established and functional in a decentralized setting. The process oversees a variety of issues, ranging from checking the availability of medicines, consumables and disposables to an audit mechanism that checks the quality of patient care in the hospital or the condition of a vehicle. External experts can also be involved in training and refresher programmes, and quality auditors that can randomly check the pre-hospital care per protocol provided to the patient. In addition, surprise audits in the field are carried out by staffs attached to headquarters. All these processes help improve the EMS over time.
- Undertake appropriate communication campaign to discourage ineffective calls in order to reduce load on the 108 call center.
- Reduce the delay in reaching the location of patients to avoid patients adopting other means of transport. At present, this is 12.24 %.(4217 out of 34425 cases) have not availed service after complaint registered. Maintain that one ambulance is available at all times by coordinating the movement of ambulances. Experiment with specialized ambulances with advanced life support system to assist road accident victims, cardiac arrest and other life threatening conditions. The current 3 ALS per district is inadequate and upgrading the BLS will help to tackle the issue. In Gajapati district there is no availability of ALS in spite of minimum 3 ALS in other two districts.

- Use of Electronic Ambulance Reporting Form (EARF), Electronic Patient Condition Reporting Form (EPCRM) and Ambulance Arrivals Board at emergency medical departments in hospitals. Assign in the field medical personnel that are adequately trained in providing ALS and where required, utilize paramedics with appropriate training in the call center or at another facility to manage less critical calls.
- Obtain independent feedback from a sample of persons who utilized the ambulance by asking for the patients' perception of (1) ambulance crew skills, tools used and pre-hospital care received, (2) care received at the hospital, and (3) the outcome in order to cross check the quality of service provided.
- Use a satellite navigation system inside the ambulance as a back-up system to correctly locate villages and reach the patient in time. Increase the number of ambulance with ALS (one in every block headquarters or more) and of appropriately trained medical personal to improve the survival chances of patients, particularly in trauma-related instances.
- Reduce vehicle breakdowns and repair time. Reduce vehicle accidents through real-time tracking of driving-related issues, feedback, training, and performance monitoring. It must be taken care that preventive maintenance must be supervised frequently in Gumma block, as these ambulances are life line and no other mode of communication is available, also due to hilly terrains and bad roads ,ambulance require high maintenance than other two blocks.
- Conduct training and certification of personnel, with potential specialization in emergency medical provision and recognition. Train individuals with a mix of technical, management and service motive skill sets.