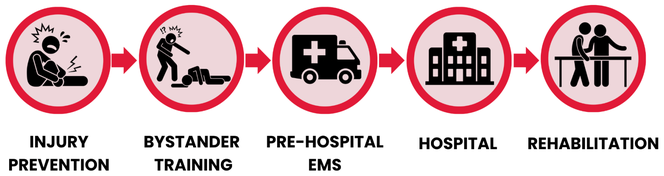
Gaps in the Trauma Chain of Survival: Needs Assessment of Ambulances and Hospitals in India

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INTRODUCTION

- Trauma is a leading cause of mortality and morbidity in India



- **Gaps** in the Trauma Chain of Survival (TCOS):
  - Partial integration of helpline numbers
  - Incomplete integration of the Good Samaritan Law
  - Lacks in prehospital notification
  - Maharashtra Paramedical Council Act
  - Trauma designation of hospitals
  - Absence of inter-hospital referral mechanism

OBJECTIVE

• To identify the gaps in the pre-hospital and in-facility care by assessing ambulances and hospital infrastructure, protocols, human resources, and equipment across multiple states in India

METHODS

- National stakeholder meeting in 2021 conducted qualitative interviews to identify systemic needs
- Cross-sectional study between 2022-2024 utilizing descriptive statistics and trend analysis to analyze our dataset
- On-site audits of 59 ambulances and 143 hospitals across 15 states utilizing standardized checklists evaluated:
  - Infrastructure
  - Human resources
  - Protocols
  - Equipment

RESULTS

At-Scene & In-Transit Care

- Emergency response #1033 was dialed 71.19%, while emergency response #108 was dialed 25.42% of the time.
- 91.52% of ALL ambulances surveyed were BLS-equipped, while 9.52% were ALS-equipped.
- 38.92% of ALL ambulance response times were >20 minutes
- 62% of ALL surveyed ambulances did not carry an AED
- 20.33% of ALL surveyed workers reported being unaware of a protocol for management of an unconscious or pulseless patient.

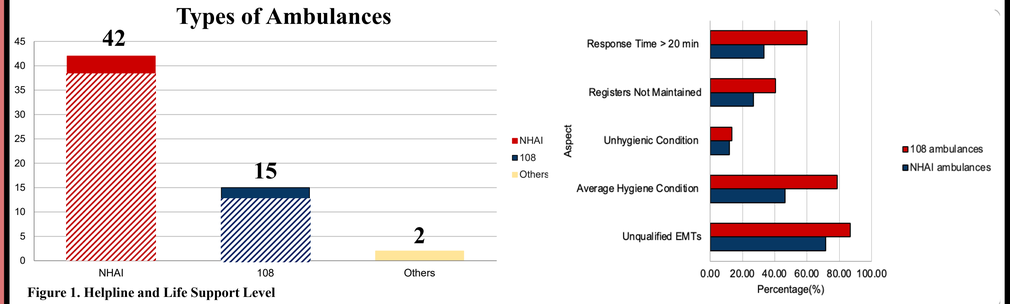


Figure 1. Helpline and Life Support Level

In-Facility Care

- 58.85% of Level 1 hospitals, 40% Level 2, 24% Level 3 and 75% Level 4 met minimum total trauma bed requirement.
- 69.57% of Level 1 Hospitals, 100% Level 2 , 100% Level 3 and 88% Level 4 met requisite number of operation theaters.
- 55.56% of Level 1 hospitals lacked the minimum required number of general surgeons, and 63.33% did not meet the orthopedic surgeon requirements.
- 70% of hospitals failed to meet the minimum equipment requirements.
- Only 29.41% of Level 1 centers met the standards for equipment availability,10.81% for Level 2 centers, 5.88% for Level 3 centers, and 6.25% for Level 4 centers.

CONCLUSIONS

Identifiable Gaps:

- Limited availability of ALS ambulances poses a risk for patients in need of critical intervention.
- Substantial delays in response time and lack of personnel knowledge.
- Lack of essential communication tools between EMS and hospitals.
- Deficiency in hospital infrastructure, medical personnel and equipment.

Addressing this gaps will require substantial investments and coordinated efforts among healthcare providers and policymakers.

DISCUSSION/NEXT STEPS

- Upgrades in ambulance equipment with at least AEDs and Bag-valve masks.
- Protocol creation for equipment maintenance and implementation within ambulance companies.
- Increase investment in EMS training program and set standardized training protocols.
- Integrate communication protocols to ensure two-way communication between ambulances and receiving facilities.
- Establish certification requirements for EMS personnel and implement continuous training programs.
- Increase recruitment and training of skilled personnel to improve quality of care.
- Establish equipment procurement standards and routine audits.

ACKNOWLEDGEMENTS