Final report for ORP-TNHSRP

Title of the research project: Evaluation of Tamil Nadu Accident and Emergency Care Initiative (TAEI) Programme in selected districts of Tamil Nadu, 2021

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Introduction and Rationale: Road traffic injuries are one of the significant causes of mortality and morbidity killing more than 1.35 million globally in 2016 and are the leading cause of death among children and young adults between ages 5 and 29years. As per the Global Status report on Road Safety 2018, more than 90% of these accidents occur in developing countries like India, which have more than 60% of the total vehicles. (1). The factors such as inappropriate driving speeds, alcohol or drug consumption, unsafe road designs, deficiency in the enforcement of safety regulations, human error, animal intervention, machine failures, adverse season, etc cause accidents, leading to high mortality and morbidity (2). A total of 4,49,002 road accidents have been reported by States and Union Territories (UTs) in the year 2019, claiming 1,51,113 lives and causing injuries to 4,51,361 persons in India (3).

Tamil Nadu has a road length of 1, 99,040 km of which 14,257 km are national and state highways(4), and has 2.8 crore vehicles of which 80% are two-wheelers (5). The state has recorded the highest number of road accidents in 2019. The Tamilnadu government has taken many initiatives to reduce mortality and morbidity due to road traffic accidents.(6) The “Tamil Nadu Accident Emergency Initiative (TAEI) ” with trauma as the third pillar to provide comprehensive emergency trauma care at all levels of healthcare to reduce the case fatality ratio due to trauma.

Tamilnadu Accident and Emergency Initiative (TAEI) has introduced protocols and guidelines on resuscitation in the prehospital site, shifting of the injured in ambulances on time with standard protocols, pre-arrival intimations, primary survey and establishment of airway breathing, and circulation on arrival and triaging based on disease severity. This process has to be completed within 2 minutes of arrival. A dedicated reporting system is in place with a TAEI ID, case sheet and referral. The patients in need of expert care are referred. This project was based on the following objectives namely:

a. To reduce the number of deaths from the accidents to half by 2023
b. To develop and implement protocols for uniform and high quality care in emergency departments across hospitals.
c. To develop and implement protocols for effective management to reduce mortality and morbidity due to trauma

d. To provide standardized management, definitive treatment for the injured within the golden hour, development of statewide referral network, state trauma surveillance center and IEC/BCC activities to spread awareness (8).

The TAEI was initiated in 2016 in 3 levels of hospitals. The south Tamil Nadu districts namely - Kanyakumari, Tirunelveli, Tenkasi, Thoothukudi, Virudhunagar districts are unique in that these 5 districts are mostly agrarian and self employed households, with significant loss of lives due to trauma, happening along the Golden Quadrilateral National Highways system in these districts. There has been some improvement in patient services which needs to be studied.

Objectives: To evaluate the TAEI program on the following

To evaluate the inputs to the program, including the activities conducted and the human and financial resources invested

To evaluate the processes of the program, including the mechanisms used to transform these activities into outcomes.

To evaluate the outcome of the program, including the benefit in terms of better health.

Methodology

Study Setting: The study will be done in the hospitals from the randomly selected 3 southern districts of Tamil Nadu. We propose to conduct the study in

Virudhunagar District: Virudhunagar Medical College Hospital (Level III Trauma Centre)
Thoothukudi District: Thoothukudi Medical College Hospital (Level II Trauma Centre)
Tenkasi District: Tenkasi Govt Hospital (Level III Trauma Centre)

Virudhunagar medical college hospital is situated on the national highway and receives most of the road traffic accident victims. It is a Level III hospital and it was a district headquarters hospital which was upgraded as a Medical college hospital recently. Thoothukudi Medical college hospital is a Level II TAEI center with specialist care. Most of the trauma patients admitted to this hospital are from road traffic accidents and industrial trauma. Tenkasi government hospital is a level III TAEI center and receives trauma patients due to road traffic accidents and social violence.

Study Design: Cross-sectional descriptive study

Study Period: 6 months

Evaluation of the program:

1. Emergency transport and Emergency Care are the critical components of the TAEI and these will be evaluated by looking at the services delivered at the facilities (4 levels) under the following arms: Emergency transport, Emergency care, and Behavioral changes. The information on Emergency care, Rehabilitation, emergency transport and community behavioral changes will be obtained by reviewing the guidelines/protocols from the state government TAEI portal, National Health Mission documents
    1) Review of records will be done at all four levels of care
    2) Interview with Stakeholders (health, Non-health and community level)
    3) The victim's interview will also be done for their satisfaction, adherence to treatment and awareness

Sample Size and Sampling technique: The facility, stakeholders and community sample size will be selected randomly

Tools: Semi-structured questionnaires, Data extraction forms, and checklists will be used to collect the data. The tools will be pilot tested and validated before the study. The separate tools will be prepared for health care workers, non-healthcare workers, victims and the community to get relevant information.

Human participants Protection: Ethical approval was obtained from Institutional Human Ethics Committee (IHEC). Informed Consent was obtained from the stakeholder and victims before the interview

Data collection

The data was collected from the Thoothukudi medical College, Virudhunagar Medical College and Tenkasi government hospital. Secondary data was collected from the TAEI App maintained by the emergency medical officer and the triage staff nurse in all these hospitals. Satisfaction questionnaire was collected from the TAEI beneficiaries (110 beneficiaries from each district) in all three districts after discharge. The time taken for them to travel from the point of Injury to the hospital, mode of transport, time taken for triage, time taken for specialist intervention, the rehabilitation services and their satisfaction about the services were the details collected from the patients. Data abstraction form details were collected from the emergency medical officer and the triage staff nurse. This abstraction form had the details of the facilities available outside the triage area, in the triage area, equipment available and the details of the display board. Community survey was taken from the areas of the three districts about the awareness of the people about TAEI program, 108 ambulance services, their utilization of these services and their satisfaction about these services. About 240 participants participated in the community survey. (The forms were enclosed for reference – Annexure I-III).

Data analysis: The collected data was analysed using Epi-Info (7.2). The continuous data was summarized and presented as Mean (SD) and categorical data was presented as frequency and proportion.

Results

In Virudhunagar medical college, the number of cases admitted due to injuries were ranged from 2600 to 4300 in 2019 to 2021. In Virudhunagar medical college, 62% in 2019, 50.5% in 2020 and 55.5% in 2021 were admitted in red zone. The number of cases referred to higher centers was 16.5% of red zone cases in 2019, 20.7% in 2020 and 17.2% in 2021. 0.4% of admitted cases in 2019, 0.1% in 2020 and 2021 died within an hour of admission at Virudhunagar medical college. Head injury, Polytrauma and vascular injury were the common causes for which the referrals were made. 12 surgeries in 2019, 9 surgeries in 2020 and 30 surgeries in 2021 were done at Virudhunagar medical college, within 6 hours of admission. The common surgeries were Intercostal drainage, K wire fixation and Wound exploration.

No of trauma cases admitted at Thoothukudi medical college hospital was an average of 11,000 in last three years. 80.3% of the admitted RTA patient utilized 108 services. 21.9% of trauma cases in 2019, 15.1% of trauma cases in 2020 and 12.6% of cases were admitted in red zone in comparison to 62.4% in 2019, 66% in 2020 and 74.8% in 2021 of cases admitted in yellow zone. In Thoothukudi medical college, no of emergency surgeries performed for trauma patients were 68 in 2019, 60 in 2020 and 130 in 2021 within 6 hours of admission. Common surgeries performed were laparotomy for Blunt injury abdomen and Penetrating injury abdomen, wound exploration, Intercostal tube thoracostomy, K wire fixation and Emergency craniotomy for SDH & EDH. 80.5% of emergency surgeries were laparotomy followed by wound exploration (13%). An average of 3.1% of trauma cases died per month within 6 hrs of admission. Only 0.1% of total trauma admission died within an hour. 0.29% of red zone cases in 2019, 0.64% of cases in 2020 and 0.56% of cases in 2021 were referred. Most of the referrals were due to pelvic fracture and vascular injury. 73.9% of cases were referred within 30 minutes to an hour of admission. In 26.1% of cases, the data was missing.

In Tenkasi government hospital, the no of trauma cases admitted was only 175 in 2020 but 840 in 2021. 86% of them were transported through 108 ambulances. In Tenkasi, the number of cases referred to higher centers was 50% in 2020 and 73.5% in 2021 of trauma cases admitted at red zone at Tenkasi. 74.3% of cases were referred within an hour of admission. The common causes for referral are head injury, open fractures, chest injury and polytrauma. 0.5% of cases died within an hour of admission. 6.3% of cases were admitted in red zone compared to 90.7% of cases in yellow zone. 56.4% of trauma cases admitted were head injury cases. Only 20 emergency cases were done in last two years in Tenkasi government hospital and were done within two hours of admission. Wound exploration and intercostal tube drainage were the common surgeries performed in Tenkasi. Cases were admitted in TAEI ward till March 2020. After that, because of COVID pandemic, the TAEI ward was not functional. It resumed it services from Jan 2021.

Community Survey

About 80 participants from each district were included in the study randomly. 61.3% of the participants were male. Most of the participants have completed only primary school of education. 87.5% of the participants from Tenkasi and Virudhunagar districts and all the participants in Thoothukudi, aware of the emergency services available at the hospital but not exactly the term TAEI program was not known. 90.4% of the participants knew about the TAEI program from their friends. Only few of the participants of community survey from Tenkasi district (28.7%) and Virudhunagar district (8.8%) but in Thoothukudi district, 75.9% of the participants of community survey had utilized the TAEI facility. 56.3% of participants from Tenkasi, 50% from Virudhunagar and 91.1% of participants from Thoothukudi were satisfied about the TAEI services. 87.5% from Tenkasi, 77.5% from Virudhunagar district and 100% of participants from Thoothukudi were aware of TN 108 services. Most of them knew about 108

services from the friends only. But only 27.5% of the participants were satisfied with the services of 108.

Satisfaction survey from patients after Discharge

About 76% of admitted patients are males. The patient waiting time in ER was about 10 minutes. 94% of patients had to wait for > 30 minutes for the 108 ambulances, to pick them up for the hospital. 0.9% of patients from Virudhunagar and 1.8% of patients in Tenkasi, told that they paid for the admission.

Outcome indicators

1. The proportion of medical officers trained in TAEI protocol
   All the medical officers posted in TAEI ward were trained in TAEI protocol.
2. The proportion of staff nurses trained in TAEI protocol
   All the staff nurses posted in TAEI ward were trained in TAEI protocol
3. The proportion of paramedical staff trained in TAEI protocol
   95 – 99% of paramedical staff posted in TAEI ward were trained in TAEI protocol
4. No of vehicles including 108 ambulances dedicated to TAEI program
   One to two 108 ambulances dedicated to TAEI program.
5. The proportion of emergency technicians of 108 ambulances trained in TAEI protocol
   85 - 90% of emergency technicians of 108 ambulances were trained in TAEI protocol
6. List of new types of equipment purchased for TAEI care center

TAEI Equipment
AED/ Defibrillator
Central Oxygen Supply
Suction Apparatus
Ventilator
Pulse oxymeter
Volume Infusion Pump
Syringe Infusion Pump
Mobile X Ray
Oxygen Flow Meter And Humidifier
ECG machine
Dressing Trolley
Stretchers/Multi-Functional Stretcher
Traction Splints (Hare, Sager, Thomas Ring)
Crash Cart
Camera
Desktop
Printer
Flash Autoclave Machine

Auto Clave Machine
Spot Light
Cell Counter
Video Laryngoscope

7. Number of training sessions conducted for medical officers for TAEI program.
   Two trainings once in three months were conducted for the training of medical officers, staff nurses and paramedical staffs, depending upon the availability of funds.
8. The proportion of patient (referred by 108 ambulance) entries made by the triage nurse in TAEI registry/ day
   99% of patients admitted in TAEI ward, who used 108 ambulance entries were made by the triage nurse in TAEI register.
9. The proportion of patient (non 108 cases) entries made by the triage nurse in TAEI registry/day.
   The proportion of patient (non 108 cases) entries made by the triage nurse in TAEI registry/day was about 80%.
10. The proportion of trauma cases transported to the TAEI center in 108 ambulances
    27.4% of trauma cases admitted at Virudhunagar, 83% of admitted trauma cases at Thoothukudi and 88.5% of admitted trauma cases at Tenkasi utilized 108 services
11. Are the private ambulance drivers aware of TAEI care centers?
    87.5% of the participants from Tenkasi and Virudhunagar districts aware of the TAEI program, but in Thoothukudi district all the participants were aware of the TAEI program.
12. No of trauma victims admitted under TAEI/ day
    No of trauma cases admitted at Thoothukudi medical college hospital was an average of 11,000/year in last three years. In Virudhunagar medical college, it was ranged from 2600 to 4300 in 2019 to 2021. In Tenkasi government hospital, the no of trauma cases admitted was only 175 in 2020 but 840 in 2021.
13. The average duration of time taken for trauma victims to reach the TAEI center?
    The average time taken by the trauma victims to reach the TAEI center was about 30 – 40 minutes.
14. The average duration of time taken for the referral?
    Most of the patients were referred within 30min – one hour of admission to higher centers.
15. The common injuries for which referrals are made?
    Only 23 cases (0.1%) were referred from Thoothukudi medical college to higher centers in last three years. Most of the referrals were due to pelvic fracture and vascular injury. In Tenkasi, the number of cases referred to higher centers was 73.5% of red zone cases in 2021 and 50% of cases in 2020 at Tenkasi. The common causes for referral are head injury, open fractures, chest injury and polytrauma. In

Virudhunagar medical college, the number of cases referred to higher centers was 16.5% of red zone cases in 2019, 20.7% in 2021 and 17.2% of red zone cases in 2021. Most common causes of referral were, for head injury, polytrauma, vascular injury and pelvic fractures

16. The average time spent by each patient in the emergency room
    The average time spent by each patient in emergency room ranged from 30 minutes to 4 hours, depending on the condition of the patients,
17. The average time taken from triage to specialist care
    The average time taken for specialist care was 10 – 15 min.
18. No. of trauma patients die within one hour of admission
    Only 0.1% of total trauma admission died within an hour
19. The mortality rate of trauma patients within 6 hrs, compared to the previous years.
    An average of 3.1% of trauma cases died per month within 6 hrs of admission
20. The incidence of quadriplegia compared to previous years.
    No data was available.
21. The proportion of cases triaged to RED zone/ day
    55% of cases in in Virudhunagar medical college, 12.6% of cases at Thoothukudi medical college and 6.3% of trauma cases at Tenkasi got admitted in the red zone.
22. Are all activities being implemented as intended? If not why?
    TAEI – ED One way entry and exit to emergency with Exit/entrance signage Boards, Adequate lighting along the boundary wall and at entry and exit of the TAEI ED, Designated Ambulance Bay, Parking facility for ambulances, staff vehicles and public vehicles, Clear “no parking zone” outside emergency area to ensure smooth inflow of traffic for bringing and taking emergency cases, Signage for Stretchers/ Trolley/ wheelchair Bay, Security staff to manage the entrance of the hospital and parking facility and other vital areas (in all 3 shifts), Helpers / attendant to provide wheelchairs and trolleys (May I Help You Staff.) at entrance and Washing Area for Trolleys and Wheelchairs were available outside the emergency department as per the TAEI protocol guidelines.

    ER Floor Marking showing location of emergency services eg. Lab, ECG, Pharmacy, Registration, Injection Room and Minor OT etc., TAEI One Stop Crisis Management Room and police outpost were available.

    Public Address(PA) System, TAEI Triage Board, One TAEI Mobile phone for PAI, Alarm System (CART), ER Resuscitation Bay, Hand washing area with elbow tap, all equipment and essential drugs needed for resuscitation were available in the triage area as per protocol.

    TAEI Protocol Display Boards, TAEI Team members with Phone numbers display, Decontamination Bay, Mass Casualty Area, Doctors Consultation room, Nurses Station, counselling room, EOT, POP room, Patient waiting area, x-ray and CT scan facilities were available as per TAEI protocol.

Permanent Oxygen Unit, Placed in a Permanent Mounting, with a Minimum Capacity of 1500 Liters and Equipped with a Reduction Gauge and Flow Meter Equipped with Reduction Gage and Flow Meter, Portable Oxygen Unit, with a Minimum Capacity of 300 Liters, Capable of Delivering Oxygen Flows of at Least 15 Liters per Minute and Equipped with a Yoke, Pressure Gage, and Flow Meter and Spare Portable Oxygen Tank of at Least 300 Liter Capacity were available.

Periodic auditing being carried out and documented. Improvements in TAEI center activities are being carried out according to the audit reports.

Discussion

Most of the medical officers, staff nurses and paramedical staffs were trained in TAEI protocol for effective functioning of the TAEI program. One to two 108 ambulance services only dedicated for each TAEI centers which takes about 30 – 40 minutes for the patient to reach the hospital. A patient had to wait to the maximum of an hour, for the 108-ambulance service. Being a cashless service, the ambulance deployment and responses are likely to be configured in favor of urban areas with a higher potential volume of cases and easy access to hospitals with emergency departments and health care resources compared to their rural counterparts. Deployment of ambulance is empirical and not on live time considerations of Road Traffic, Traffic signals, technical delays and importantly updated accidental hotspots periodically. This leads to an apparent time delay in reaching the RTA site as each ambulance must shunt a longer distance. 4 - 9% of patients were brought dead to the hospital in last three years. 30.2% of RTA patients in Virudhunagar medical college, 83% of RTA patients in Thoothukudi medical college and 88.5% of RTA patients in Tenkasi govt. hospital who got admitted in TAEI ward utilized 108 services and the rest of patients who used other modes of transport missed the pre-hospital care.

Many new equipment had been purchased including ventilator and Defibrillators which helped to reduce the mortality of the patients admitted in TAEI ward. The mortality of patients who had admitted in TAEI ward was about 4% in last three years. The number of trauma victims admitted in Thoothukudi medical college is very high compared to Tenkasi government hospital. The average time spent by the patient in the triage areas was about 5 – 15 minutes. Most of the patients received specialist intervention in 30 – 40 minutes.

48% of patients to the maximum of 70% of patients who got admitted due to road traffic accidents had head injury. The common causes of referral were for head injury, pelvic fracture, vascular injury and polytrauma. The availability of neuro surgeon and orthopedic surgeon with improving the infra structure will reduce the references.

3 – 12% of trauma cases admitted are being operated. The common surgeries were laparotomy, wound exploration and intercostal tube drainage. The numbers were too low. The reasons may be due to inadequate entries in the register. They have not included minor surgeries done in the TAEI App register. The equipment and drugs were found adequate in red zone for the effective resuscitation of patients.

The primary, secondary and tertiary care were well provided in TAEI centers except quaternary care i.e. Rehabilitation services is poor. Physiotherapy services were provided in medical college TAEI centers during the admission period. After discharge, no rehabilitation services were provided by the TAEI centers.

Recommendations

1. Dedicated utilization of the services of trained medical officers, staff nurses and paramedical staff without shifting them for other services should be done, for the effective function of TAEI program.
2. If the 108 ambulances are deployed according to real time traffic conditions and accident zones, the time delay in reaching the hospital will be prevented thereby can decrease the mortality rate.
3. The utilization of 108 services can be improved by increasing the awareness among the public which will improve the pre-hospital care thereby decreasing the morbidity and mortality rate.
4. Neurosurgeon and vascular/ plastic surgeon availability in all TAEI centers with improving the infrastructure for intervention will reduce the mortality from head injury.
5. The entries made in the TAEI registers to be improved by including the treatment particulars even the minor surgical procedures. This will help to improve the success rate of TAEI program.
6. The rehabilitation program should be improved in TAEI centers to improve the productivity of the injured patients.

References:

1. World Health Organization. Global status report on road safety 2018: Summary. World Health Organization; 2018.
2. Who.int. 2021 [cited 13 March 2021]. Available from: https://www.who.int/violence_injury_prevention/road_traffic/activities/roadsafety_training_manual_unit_2.pdf
3. Morth.nic.in. 2021 [cited 13 March 2021]. Available from: https://morth.nic.in/sites/default/files/RA_Uploading.pdf
4. Tnenvis.nic.in. 2021 [cited 13 March 2021]. Available from: http://www.tnenvis.nic.in/Content/Infrastructure_1172.aspx?format=Print
5. VAHAN SEWA| DASHBOARD. Vahan.parivahan.gov.in. 2021 [cited 13 March 2021]. Available from: https://vahan.parivahan.gov.in/vahan4dashboard/
6. Transport Department, Govt of Tamil Nadu, India [Internet]. Tnsta.gov.in. 2021 [cited 13 March 2021]. Available from: https://tnsta.gov.in/roadsafety_content.jsp
7. Suganthi S, Raja V P. Poisoning and its pattern among patients in a tertiary care center in Kancheepuram district, Tamil Nadu. J Edu Health Promot [serial online] 2019 [cited 2021 Sep 16];8:194
8. Government of Tamil Nadu. TAEI Manual (Protocol & Guidelines of Tamil Nadu Accident and Emergency Care Initiative. [cited 13 March 2021]. Available from:https://www.taeionline.

Questionnaire for Patients – Patients/Victim satisfaction level

Place: Date:

S.No	Question	Type of variable	Response	Remarks
Patient demographic details				
1.	ID number assigned	Alphanumeric		
2.	Name	Text		
3.	Age (in completed years)	Discrete		
4.	Gender	Nominal	1. Male 2. Female 3. Transgender	
	Get the type of Injuries, admission date and other relevant data from the medical register			

S.No	Question	Type of variable	Response	Remarks
Transportation				
6	What mode of transportation did you use to come to this facility?		1. Govt. ambulance 2. Private ambulance 3. Two wheelers 4. Bus 5. Car 6. Others_____ 7. NA	
7	How much time you waited to get the ambulance after you called? *(if ambulance used)*		_____	(mention the time in minutes)
8	Did you receive first aid in the ambulance? *(if used ambulance)*		1.Yes 2. No 3.NA	
9	Did you reach the centre with 60 minutes? *(any mode of transportation)*		1.Yes 2.No 3.NA	
10	How much you paid for the ambulance services? (if used ambulance)		_____	
11	Did the facility staff done the Triage (Red, Yellow, Green)?		1.Yes 2.No 3.NA	
12	If yes, which criteria		1.Red 2.Yellow 3.Green	
13	Did your vital signs such as BP, Temperature monitored after you admitted in the facility?		1.Yes 2.No	

			3.NA	
14	How much time you waited between entering and receiving the first treatment?		_____ (mins)	
15	Did you pay any amount during your admission time? (*includes payments for medicines, tests, procedures, medical consultations and any other medical services)*		1.Yes 2.No 3.NA	
16	If yes, mention the amount		_____	
17	Did you get any Rehabilitation therapies such as physiotherapy, Speech therapy,			
18	Are you satisfied the services provided here		1.Yes 2.No 3.NA	

Patients satisfaction level on the facilities services offered in the centre

S.No	Questions	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
1	Guided properly in completing the paper work					
2	Prompt care at casualty					
3	Nursing care in ward					
4	Diagnosis					
5	Communication with doctors about the procedures and treatments					
6	Doctors					
7	Nurse					
8	Technicians					
9	With accessory services					
10	Laboratory (Blood investigations					
11	Imaging investigations such as CT, X-Ray					
12	Blood bank					
13	Radiology					
14	Hospital food					
15	Hospital equipment’s					

16	Toilets/bath rooms					
17	Cleanliness of the hospital/ward					
18	Safety					
19	Overall satisfactory level					

Indicators

S.No	Indicator
1	Proportion of cases in admitted in ICU in last one month
2	Number of trauma cases among admitted cases in last one month
3	Proportion of cases referred in last one month
4	Proportion of cases died among admitted in last one month
	Proportion of mortality among 100 trauma cases
5	Proportion of trained specialists (ATLS)
6	Proportion of trained nurses (ATCN)
7	Proportion of red triage cases among admitted in the last one month
8	Proportion of cases admitted in ER as IP
9	Proportion of case used government ambulance services to reach the centre
10	Proportion of cases reached in golden hour (injury cases)
11	Average waiting time in the centre for treatment
12	Proportion of victims satisfied with services offered by the centres
13	proportion of community aware the TAEI centre

Community survey

Place: **Date:**

S.No	Question	Type of variable	Response	Remarks
Patient demographic details				
1.	Name	Text		
2.	Age (in completed years)	Discrete		
3.	Gender	Nominal	1. Male 2. Female 3. Transgender	
4.	Education	Nominal	1. Primary school 2. Higher secondary school 3. Undergraduate 4. Post graduate 5. Illiterate 6. Others_____	
5.	Occupation		_____	
6.	Place of living	Nominal	Urban Rural	
7.	Are you are aware of Tamil Nadu TAEI initiatives		Yes/No	

S.No	Question	Type of variable	Response	Remarks
8.	If yes, how did you come to know		1. Electronic Media 2. News paper 3. Friends 4. Other	
9.	How you ever used the services?		Yes No	
10.	For what purpose you used the services		Yes No	
11.	Do you think the quality of services is good in the centre?		Yes/No	
12.	Are you aware of Tamil Nadu 108 ambulance services?		Yes No	
13.	If yes, how do you know			
14.	How you ever used the services?		Yes No	
15.	For what purpose you used the services		Yes No	
16.	Do you think the quality of services is good in the centre?			

Data abstraction form and observational form

Centre name **Date:**

Respondent name: **Location**:

S.No	Questions	Response	Numbers	Remarks
1	Total number victims present today			
	Total number of patients by place	1. ICU 2. Ward 3. Other		
	Total number of patients with types of services for last six months	1. Trauma Care 2. Management of Acute MI 3. Management of Stroke 4. Management of Burns 5. Management of Poisoning 6. Management of Paediatric	M1 M2 M3 M4 M5 M6	

	Total number of cases for last six months		M1	M2	M3	M4	M5	M6	
		Total Trauma							
		Total Admitted							
		Total RTA							
		Total Fall							
		Total Assault							
		Total Head injury							
		Total Surgery							
		CT Done							
		Blood Transfusion							
		Refered out							
		Brought by 108							
		Ift 108							
		Brought dead							
		RTA died at Hospital							
	No of ambulance vehicles available								

Table: ER standards equipment's *(currently)*

S.No	ER STANDARDS EQUIPMENTS	Available in Numbers	Functional in Numbers	AMC (If Applicable)Yes/No
1	AED			
2	Central Oxygen Supply			
3	Suction Apparatus			
4	Ventilator			
5	Pulsoxymeter			
6	POTC - Machine (incl Cartridges)			
7	Volume Infusion Pump			
8	Syringe Infusion Pump			
9	Mobile X Ray			
10	Oxygen Flow Meter And Humidifier			
11	ECG			
12	Dressing Trolley			
13	Stretchers/Multi Functional Stretcher			
14	Wheel Chair			
15	Spine Board			
16	Scoop Board			
17	Iv Stand			
18	Traction Splints (Hare, Sager, Thomas Ring)			
19	Crash Cart			
20	Camera			
21	Desktop			
22	Printer			
23	Flash Autoclave Machine			
24	Auto Clave Machine			
25	Spot Light			
26	Cell Counter			
27	EC Pulse (CPR Machine)			
28	Video Laryngoscope			

Table: ER standard drugs

S.No	ER STANDARD DRUGS	Available as on date	Short Expiry Within 2 months	Remarks
1	Ns -500 ml			
2	Rl-500 ml			
3	D25 %			
4	Inj Atropine			
5	Inj Adrenaline			
6	Inj Amiodarone			
7	Inj Soda Bicarb			
8	Inj Midazolam			
9	Inj Adenosine			
10	Inj Dopamine			
11	Inj Dobutamine			
12	Inj Ntg			
13	Inj Mgso4			
14	Inj Lasix			
15	Inj Vasopressin			
16	Inj Kcl			
17	Inj Ca Gluconate			
18	Inj Lidocaine			
19	Inj Lorazepam			
20	Sterile Water			
21	Inj. Paracetamol 1G- Iv			
22	Paracetamol Suppository			

Table: **Facilities available outside emergency department**

S.No	OUTSIDE EMERGENCY DEPARTMENT	Yes/No	Remarks
1	Signage in the city on main roads to inform the Location of TAEI Center		
2	TAEI Boards & signage on the boundary wall of the hospital		
3	TAEI – ED One way entry and exit to emergencywith Exit/entrance signage Boards		
4	Adequate lighting along the boundary wall and at entry and exit of the TAEI ED		
5	Safe drinking water Port near main exit of the TAEI ED		
6	Designated Ambulance Bay		
7	Parking facility for:		
	(a) Ambulance		
	(b) Staff Vehicles		
	(c) Public Vehicles		
	(d) Clear "no parking zone" outside emergency area to ensure smooth inflow of traffic for bringing and taking emergency cases		
8	Signage for Stretchers/ Trolley/ wheelchair Bay.		
9	How many:(In Numbers)		
	(A) Wheelchairs		
	(B) Trolleys		
	(C) Stretchers		
	How many have safety belts		
10	Security staff to manage the entrance of the hospital and parking facility and other vital areas (in all 3 shifts)		
11	Helpers / attendant to provide wheelchairs and trolleys (May I Help You Staff.) at entrance		
12	Washing Area for Trolleys and Wheelchairs		

Table: Facilities available inside emergency department

S.No	INSIDE EMERGENCY DEPARTMENT	Yes/No	Remarks
1	ER Floor Marking showing location of emergency services eg. Lab, ECG, Pharmacy, Registration, Injection Room, Minor OT etc		
2	TAEI One Stop Crisis Management Room		
3	3 Police Out Post		
4	Has the ER been Reorganized?		
	Pre-arrival Desk with PAI Register & TAEI centers Phone number displayed		
5	**TAEI - Triage Area**		
	(A) Public Address(PA) System		
	(B) Triage Forms		
	No of Triage forms used till now		
	is there adequate stock of TAEI Triage forms		
	(C) TAEI Triage Board		
	(D) Stethoscope in Sizes to Accommodate all Patients		
	Paediatric		
	Adult		
	Infant		
	(E) Blood Pressure Cuffs in Sizes to Accommodate all Patients		
	Paediatric		
	Adult		
	Infant		
	(F) Patient Care Flashlights		
	(G) Thermometer(s) with Low Temperature Capability		
	Oral thermometer		
	Rectal thermometer		
	Biohazard thermometer		
	(H)Scissors for Cutting Clothing, Belts, and Boots		
	(I) Broselows Tape		
	(J)Probes		
	(K) Glucometer with Reagent strips and single use lancets		
	(L) Multi-paramonitor		
	(M) Pulse oximeter		
	(N) Scoop Boards/ Spine Board with Head Rest and Belt(7)		
	(O) Sharps Container		
	(P) Antiemetics, Analgesics, Antacids		
	(Q) Triage Registers		
5	**TAEI - Red Zone**		
	(A) Public Address (PA) System		
	(B) One TAEI Mobile phone for PAI		
	(C) Alarm System (CART)		

	(D)How many ER Resuscitation Bay available (1 ER Resuscitation Bay for 400 IP)		
	(E) Does it have Foot markings around the hydraulic ER bed/trolley		
	(F) Adequate Illumination - 400 Lux		
	Hand washing area with:		
	Elbow tap		
	Mirror		
6	**TAEI - Yellow Zone**		
	(A) No.of Beds in Yellow zone		
	(B) Hand washing area with:		
	Elbow tap		
	Mirror		
7	**TAEI Green Zone**		
	(A) Stethoscope in Sizes to Accommodate all Patients		
	Paediatric		
	Adult		
	Infant		
	(B) Blood Pressure Cuffs in Sizes to Accommodate all Patients		
	Paediatric		
	Adult		
	Infant		
	(C) 2 Patient Care Flashlights		
	(D)Thermometer(s) with Low Temperature Capability		
	Oral thermometer		
	Rectal thermometer		
	Biohazard thermometer		
	(E) Pulse Oximeter with		
	Adult		
	Paediatric		
	Probes		
	(F)Glucometer with Reagent strips and single use lancets		
	(G) Multi-paramonitor		
	(H) Scoop Boards		
	(I) Sharps Container		
	(J) Antiemetics, Analgesics, Antacids		
8	Biomedical Waste Management		
9	List of PAI Phone numbers displayed		
10	List of TAEI Team members with Phone numbers displayed		
11	TAEI App Board - Daily data displayed		
12	TAEI Protocol Display Boards		
13	Decontamination Bay		
14	Mass Casualty Area		
15	Doctors Consultation room		
16	Nurses Station		

17	Counselling Room		
18	EOT		
19	POP Room		
20	Xray		
21	CT Scan		
22	Permanent Oxygen Unit, Placed in a Permanent Mounting, with a Minimum Capacity of 1500 Liters and Equipped with a Reduction Gauge and Flow Meter Equipped with Reduction Gage and Flow Meter		
23	Portable Oxygen Unit, with a Minimum Capacity of 300 Liters, Capable of Delivering Oxygen Flows of at Least 15 Liters per Minute and Equipped with a Yoke, Pressure Gage, and Flow Meter		
24	Spare Portable Oxygen Tank of at Least 300 Liter Capacity		
25	Patient waiting area		
26	Canteen / Food zone		
27	**Scroll outside /LCD display Name and Phone No.of**		
	(A) Doctor on duty (EMO 1&2)		
	(B) Specialist on call and second on call of each specialty		
	(C) In charge of ED Department		
	(D) RMO/ DTNO/ HTNO		
	(E) In charge of Police post		
	(F)In charge of Transport/108 Ambulance		
	(G) Help line Hearse & Red Cross Number		
	(H) Help line Women Cell (Rape Victims/Violence against Women etc.)		
	(J) Police post In charge		
	(K) Tertiary care centre (nearest to the Hospital)		
	(L) Available range of services in TAEI ED		
	(M) Matron of Hospital		
	(N) DTNC		
	(O) TNC on duty		
	(P) TAEI Nurses on duty		
	(Q) MNA/ FNA/ OT / POP tech		
	(R) Security Guard on duty		

Table: Available of equipment's

27	**TAEI Equipment**	**RED**	**YELLOW**	**GREEN**
	AED/ Defibrillator			
	Central Oxygen Supply			
	Suction Apparatus			
	Ventilator			
	Pulse oxymeter			
	POTC - Machine (incl Cartridges)			
	Volume Infusion Pump			
	Syringe Infusion Pump			
	Mobile X Ray			
	Oxygen Flow Meter And Humidifier			
	ECG			
	Dressing Trolley			
	Stretchers/Multi Functional Stretcher			
	Wheel Chair			
	Spine Board and Head rest with Belt(7)			
	Scoop Board			
	IV Stand			
	Traction Splints (Hare, Sager, Thomas Ring)			
	Crash Cart			
	Adult			
	Paediatric			
	Camera			
	Desktop			
	Printer			
	Flash Autoclave Machine			
	Auto Clave Machine			
	Spot Light			
	Cell Counter			
	EC Pulse (CPR Machine)			
	Video Laryngoscope			
	DDA Cupboard - Dangerous Drug Act with Narcotic Register			

Table: list of TAEI team

S.No	Team	Available number
1	District Trauma Nodal Officer (JD)	
2	Dean/Medical Superintendent	
3	RMO	
4	District Trauma Nurse Co-ordinator	
5	Hospital TAEI Nodal Officer (HTNO)	
6	Nursing Superintendent	
7	General surgeon	
8	General Physician	
9	Orthopaedician	
10	Paediatrician	
11	Anesthetist	
12	Neurosurgeon	
13	TAEI Medical Officer - 8 - (EMO's)	
14	TAEI Nurse Co-ordinator – 2 (TNC)	
15	TAEI Nurse	
16	POP Technician	
17	OT Assistant	
18	MNA/FNA	
19	Hospital Worker	
20	Security Guard	

Table: details of funds allocated and expenditure in last one year

S.No	Activities	Funds received	Fund utilized	Remarks
1	Training			
2	Infrastructure			
3	Equipmenst			
4	Drugs			
5	Other			
6	Other			

Questionnaire for Nodal officer

Centre: Date:

S.No	Question	Type of variable	Response	Remarks
Identifiers				
1.	Age (in completed years)			
2.	Gender		1. Male 2. Female	
3.	Designation			
4.	Speciality			
Work related information				
5.	Total number of years' experience?		_____	
6.	Total number of year experience in TAEI centre?		_____	
7.	Do you have the emergency department, intensive care unit, blood? bank rehabilitation services in the facility?		1.Yes 2.No 3.Not available	
TAEI centre services related information				
8.	How many beds available in the centre for victims?		Red beds_____	

S.No	Question	Type of variable	Response	Remarks
			Yellow beds_____ Green beds_____	
9.	Do you have Emergency Stabilization centre (ECC) in the facility?		1.Yes 2.No 3.NA	
10.	Do you have Institutional Framework for your Trauma care facility?		1.Yes 2.No 3.NA	
11.	Do you all the Infrastructure facilities as mentioned in the guidelines?		1.Yes 2.No 3.NA	
12.	Do you have all the Human resources in your Trauma care facility		1.Yes 2.No 3.NA	
13.	If now, how you are providing the services in the centre?		_____	
14.	In your centre, do you have all the equipment's to provide the services?		1.Yes 2.No 3.NA	
15.	If no, how do you manage the patients?		_____	

S.No	Question	Type of variable	Response	Remarks
16.	Do you have all the protocols in the centre for victims care		1.Yes 2.No 3.NA	
17.	Did the health care staff (Doctors, specialist's nurses) receive any training for TAEI?		1.Yes 2.No 3.NA	
18.	If yes, when was the last training conducted?		_____	
19.	How many trainings organized in last one year?		_____	
20.	please mention who were all received the training		1. Doctors 2. Surgeon 3. Anesthetist 4. Orthopaedic 5. Nurse 6. Non-health care workers 7. Others_____	
21.	Do you assess the quality of care of services?		1.Yes 2.No 3.NA	
22.	If yes, how do you assess (multiple selection)		1. Review of critical cases 2. Audit of death cases 3. Audit of case sheets 4. Verbal autopsy (death cases)	

S.No	Question	Type of variable	Response	Remarks
			5. Other____	
23.	If now, how do you maintain the quality of services?		_____	
24.	Any research activities carried out after TAEI Trauma care facility opened?		1.Yes 2.No 3.NA	
25.	If yes, kindly provide the details of the research?		_____	
26.	Do you have emergency room for TAEI facilities?		1.Yes 2.No 3.NA	
27.	If yes, do you follow the following procedures/ items the emergency rooms		a. Triage b. PreArrival Intimation(PAI) c. Colour coding of ER d. Patient Management CheckList from Admission to Discharge e. Emergency Manual f. Advanced Trauma Life Support (ATLS) Protocols g. Appropriate linkage with Multi Disciplinary Teams at Hospital levels h. Appropriate linkage with 108 Ambulance Services i. MIS j. Display Boards k. Branding	

S.No	Question	Type of variable	Response	Remarks
28.	Do you Multi-Disciplinary Critical Care unit (MDCCU) in your Trauma care facility?		1.Yes 2.No 3.NA	
29.	Do you report the data to TAEI Surveillance Centre from the Trauma care facility?		1.Yes 2.No 3.NA	
30.	If no, why you are not providing the data?		_____	
31.	Did the doctors receive any Advanced Trauma Life Support (ATLS) training?		1.Yes 2.No 3.NA	
32.	Did the nurses receive Advanced Trauma Care for Nurses (ATCN).		1.Yes 2.No 3.NA	
33.	Did you face any Medico Legal Cases in the past?		1.Yes 2.No 3.NA	
34.	If yes, provide the details		_____	
35.	Do you enter the data In RADMS		1.Yes 2.No 3.NA	

S.No	Question	Type of variable	Response	Remarks
36.	If no, kindly provide the reason?		_____	
37.	In last 6 months, how many meetings you have organized with team for review and evaluation in your centre?		_____	
38.	If yes, do you have any report (please take the copy of the report)		_____	
39.	In the last one year, did you organize any IEC/awareness meeting for community?		1.Yes 2.No 3.NA	
40.	If yes, how many meetings organized?		_____	
41.	How many community people participated in this meeting?		_____	
42.	What kind of methods/modes you used for community training?		1. Books 2. Brochures 3. Print and Visual Media 4. Social Media	
43.	Do you have 108 ambulance service data in your centre *(how many cases a day and basic details of the cases?*		1.Yes 2.No 3.NA	
44.	Do you have on-call facility for neurosurgeons, paediatricians in the centre?		1.Yes 2.No	

S.No	Question	Type of variable	Response	Remarks
			3.NA	
45.	If no, how do you manage the cases?		----------	
46.	Did the present/Current ED staff receive TAEI Skills Certificates?		1.Yes 2.No 3.NA	
47.	If yes, how many staff received?		_____	
48.	Do you have 24-hour telephone consultation services?		1.Yes 2.No 3.NA	
49.	Do you have all the following register in your centre?		1.Triage Form 2.Case Sheets 3. Admission Register with Pre-arrival Intimation Status 4. Discharge Register 5. Death Register 6. MLC register 7. Transfer in and out register 8. Crash cart Checklist 9.Other_____	
50.	If no, how you are maintaining the case details?		_____	

S.No	Question	Type of variable	Response	Remarks
51.	How you are disposing the medical wastes from the centre?			
52.	Do you have a rehabilitation team in the centre?		1.Yes 2.No 3.NA	
53.	If yes, mention the members of the team		_____	
54.	If no, how you managing the patients those who need rehabilitation?		_____	
55.	Do you use mobile app for data collection?		1.Yes 2.No 3.NA	
56.	Kindly provide the challenges in the TAEI centre you are facing		_____	
57.	Any suggestions to improve the centre?		_____	