

National Health Systems Resource Centre

**EMERGENCY MEDICAL SERVICE (EMS) IN  
INDIA: A CONCEPT PAPER**

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The views expressed in paper are that of the authors and does not in any way reflect the opinion of the Ministry of Health and Family Welfare, Government of India.

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## Executive Summary

*Emergency Medical Service (EMS) is provided by a variety of individuals, using a variety of methods. To some extent, these are determined by country and locale, with each individual country having its own 'approach' to how EMS should be provided, and by whom. In some parts of Europe, for example, legislation insists that efforts at providing Advanced Life Support (ALS) services must be physician-led, while others permit some elements of that skill set to specially trained nurses, but have no paramedics. Elsewhere, as in North America, the UK and Australia, ALS services are performed by paramedics, but rarely with the type of direct "hands-on" physician leadership seen in Europe.*

*The goal of emergency medical services is to either provide treatment to those in need of urgent medical care, with the goal of satisfactorily treating the malady, or arranging for timely removal of the patient to the next point of definitive care. This is most likely a Casualty at a hospital or another place where physicians are available. The term Emergency Medical Service (EMS) evolved to reflect a change from a simple transportation system (ambulance service) to a system in which actual medical care occurred in addition to transportation. In some developing regions, the term is not used, or may be used inaccurately, since the service in question does not provide treatment to the patients, but only the provision of transport to the point of care.*

*In India, EMS is a relatively new concept, where the most dominant model is the EMRI services. As of December 2009, more than 2,600 ambulances are operating under EMRI across around 10 states in India. Some other states like Bihar, Kerala, Himachal Pradesh and Delhi, have adopted EMRI-like model, but have some other agencies operating the EMS in those states. States like Madhya Pradesh and West Bengal had opted for basic transportation services (without stabilization care) in the PPP mode through multiple agencies (mostly NGOs) contracted at district/block level.*

*The central government support to the above mentioned schemes is mainly in the form of capital expenditure (capex) support. Operating expenditure (opex) is borne by the states, with the central support being progressively reduced from 60% of opex to begin with, to zero by the 3<sup>rd</sup> year of operations. For the year 2010-11, total of Rs. 227.10 crores have been sanctioned under NRHM for 11 states (including 4 EAG states and 2 North-Eastern states) – for Emergency Referral Transportation System (ERTS), mostly through EMRI in PPP mode.*

*Various studies, including a review of EMRI by the health ministry found the following gaps in the existing EMS in India:*

- Hospital infrastructure, especially in public hospitals, for treating and managing medical emergencies need further strengthening.*
- Lack of training and training infrastructure for training health staff (public or private) and other stakeholders in medical emergency management/first aid.*

- *Fleet of existing government owned ambulances not liked with the new ERTS schemes (in terms of operational linkages and standardization across fleet).*
- *Legal framework defining and regulating roles and liabilities of various stakeholders (like ambulance operators, emergency technicians, treating hospitals and staff, etc.) needs further clarity/transparency, standardization and enforcement across the states.*

*Keeping in view the above mentioned gaps, the proposed EMS for India would necessitate focusing on the following components, as a necessary part of the system:*

- 1. Ambulance – operations and maintenance*
- 2. Call Centre – for ambulance dispatch and control*
- 3. Empanelled health facilities/hospitals – ensuring quality of care*
- 4. Information System and Knowledge Management – using multi-media and multi-channel data management*
- 5. Training – for emergency case management on-site, in-transit, and in hospitals*
- 6. Health Education – among general public*
- 7. Legal framework – to define roles and liabilities of various stakeholders*
- 8. Governance – for transparency and regulation*

*Regarding the financial implications of a national EMS, it was estimated that Operating cost, at current level of operations and prices, is approximately Rs 15 to Rs 17 lakhs per ambulance per year (including an annualised capital cost of Rs. Three to Five Lakhs per year). These costs could be expected to rise further. Thus the currently estimated Rs. 1,700 crores required per year for a projected fleet of 10,000 ambulances needed nationwide (accounting for around one ambulance per lakh population) could finally be two to three times this amount. In a scenario where the commitment to raise health care expenditure to 3% of the GDP is adhered to, this Rs 1700 to Rs 3000 crores commitment would help reach this goal. These cost estimates do not include financial implications of increased training and health education, and infrastructure strengthening needed for public hospitals for managing medical emergencies.*

*The proposed EMS would also need to have linkages with existing ambulance fleet of the states and also with schemes like RSBY. The existing fleet of government owned ambulances, especially at secondary and tertiary level hospitals may be converted to Advanced Life Support (ALS) standard, exclusively for inter-institution transfers. Integration of EMS would also be needed within the framework of RSBY (or other such schemes), to establish links with identified hospitals to provide emergency care and also for payments (RSBY already has provisions for reimbursement for transportation). On the other hand, facility upgradation in public hospitals for trauma units, ICU/CCU, blood bank, etc., may be undertaken under NRHM and other central government schemes.*

## 1. Emergency Medical Service (EMS): An Overview

**Emergency Medical Service (EMS)** is a branch of emergency services dedicated to providing out-of-hospital acute medical care and/or transport to definitive care, to patients with illnesses and injuries which the patient, or the medical practitioner, believes constitutes a medical emergency.

The goal of emergency medical services is to either provide treatment to those in need of urgent medical care, with the goal of satisfactorily treating the malady, or arranging for timely removal of the patient to the next point of definitive care. This is most likely a Casualty at a hospital or another place where physicians are available. The term **Emergency Medical Service** evolved to *reflect a change from a simple transportation system (ambulance service) to a system in which actual medical care occurred in addition to transportation*. In some developing regions, the term is not used, or may be used inaccurately, since the service in question does not provide treatment to the patients, but only the provision of transport to the point of care.



In most places in the world, the EMS is summoned by members of the public (or other emergency services, businesses or authority) via an emergency telephone number which puts them in contact with a control facility, which will then dispatch a suitable resource to deal with the situation.

In some parts of the world, the term EMS also encompasses services developed to move patients from one medical facility to an alternative one; inferring transfer to a higher level of care. In such services, the EMS is not summoned by members of the public but by clinical professionals (e.g. physicians or nurses) in the referring facility. Specialized hospitals that provide higher levels of care may include services such as neonatal intensive care (NICU), pediatric intensive care (PICU), state regional burn centres, specialized care for spinal injury and/or neurosurgery, regional stroke centers, specialized cardiac care (cardiac catheterization), and specialized/regional trauma care.



In some jurisdictions, EMS units may handle technical rescue operations such as extrication, water rescue, and search and rescue. Training and qualification levels for members and employees of emergency medical services vary widely throughout the world. In some systems, members may be present who are qualified only to drive the ambulance, with no medical training. In contrast, most systems have personnel who retain at least basic first aid

certifications, such as Basic Life Support (BLS). Additionally many EMS systems are staffed with Advanced Life Support (ALS) personnel, including paramedics, nurses, or, less commonly, physicians.

The most basic emergency medical services are provided as a transport operation only, simply to take patients from their location to the nearest medical treatment. This was often the case in a historical context, and is still true in the developing world, where operators as diverse as taxi drivers and undertakers may operate this service. Most developed countries now provide a government funded emergency medical service, which can be run on a national level, as is the case in the United Kingdom, where a national network of ambulance trusts operate an emergency service, paid for through central taxation, and available to anyone in need; or can be run on a more regional model, as is the case in the United States, where individual authorities have the responsibility for providing these services.

Some countries closely regulate the industry (and may require anyone working on an ambulance to be qualified to a set level), whereas others allow quite wide differences between types of operator.

- 1) **Government Ambulance Service** – Operating separately from (although alongside) the fire and police service of the area, these ambulances are funded by local, provincial or national government. In some countries, these only tend to be found in big cities, whereas in countries such as U.K., almost all emergency ambulances are part of a national health system.
- 2) **Fire or Police Linked Service** – In countries such as the U.S.A., Japan, and France; ambulances can be operated by the local fire or police service. This is particularly common in rural areas, where maintaining a separate service is not necessarily cost effective. In some cases this can lead to an illness or injury being attended by a vehicle other than an ambulance, such as a fire truck.
- 3) **Volunteer Ambulance Service** – Charities or non-profit companies operate ambulances, both in an emergency and patient transport function. They may be linked to a voluntary fire service, with volunteers providing both services. There are charities which focus on providing ambulances for the community, or for cover at private events (sports etc.). The Red Cross provides this service across the world on a volunteer basis (and in others as a Private Ambulance Service). These volunteer ambulances may be seen providing support to the full time ambulance crews during times of emergency. In some cases the volunteer charity may employ paid members of staff alongside volunteers to operate a full time ambulance service, such in some parts of Australia, Ireland and most importantly Germany and Austria.
- 4) **Private Ambulance Service** – Normal commercial companies with paid employees, but often on contract to the local or national government. Private companies may provide only the patient transport elements of ambulance care (i.e. non urgent), but in some places, they are contracted to provide emergency care, or to form a 'second tier' response, where they only respond to emergencies when all of the full-time emergency ambulance crews are busy. This may mean that a government or other service provide the 'emergency' cover, whilst a private firm may be charged with 'minor injuries' such as

cuts, bruises or even helping the mobility impaired if they have for example fallen and just need help to get up again, but do not need treatment. This system has the benefit of keeping emergency crews available all the time for genuine emergencies.

- 5) **Combined Emergency Service** – these are full service emergency service agencies, which may be found in places such as airports. Their key feature is that all personnel are trained not only in ambulance (EMT) care, but as a firefighter and a peace officer (police function).
- 6) **Hospital Based Service** – Hospitals may provide their own ambulance service as a service to the community, or where ambulance care is unreliable or chargeable. Their use would be dependent on using the services of the providing hospital.
- 7) **Company Ambulance** - Many large factories and other industrial centres, such as chemical plants, oil refineries, breweries and distilleries have ambulance services provided by employers as a means of protecting their interests and the welfare of their staff. These are often used as first response vehicles in the event of a fire or explosion.

Emergency Medical Service is provided by a variety of individuals, using a variety of methods. To some extent, these are determined by country and locale, with each individual country having its own 'approach' to how EMS should be provided, and by whom. In some parts of Europe, for example, legislation insists that efforts at providing Advanced Life Support (ALS) services must be physician-led, while others permit some elements of that skill set to specially trained nurses, but have no paramedics. Elsewhere, as in North America, the UK and Australia, ALS services are performed by paramedics, but rarely with the type of direct "hands-on" physician leadership seen in Europe. Increasingly, particularly in the UK and in South Africa, the role is being provided by specially-trained paramedics who are independent practitioners in their own right.



Generally speaking, the levels of service available will fall into one of three categories; Basic Life Support (BLS), Advanced Life Support (ALS), and in some jurisdictions, a Intermediate Life Support (ILS), which is essentially a BLS provider with a moderately expanded skill set, may be present, but this level rarely functions independently, and where it is present may replace BLS in the emergency part of the service. When this occurs, any remaining staff at the BLS level is usually relegated to the non-emergency transportation function.

While designing an Emergency Medical Service, the essential decision in pre-hospital care is whether the patient should be immediately taken to the hospital, or advanced care resources are taken to the patient where they lie. The "scoop and run" approach is exemplified by the MEDEVAC aero-medical evacuation helicopter, whereas the "stay and play" is exemplified by the French and Belgian SMUR emergency mobile resuscitation unit. The strategy developed for pre-hospital trauma care in North America is based on the Golden Hour theory, i.e., that a trauma victim's best chance for survival is in an operating room, with the goal of having the

patient in surgery within an hour of the traumatic event. This appears to be true in cases of internal bleeding, especially penetrating trauma such as gunshot or stab wounds. Thus, minimal time is spent providing pre-hospital care (spine immobilization; "ABCs", i.e. ensure airway, breathing and circulation; external bleeding control; endotracheal intubation) and the victim is transported as fast as possible to a trauma centre.

The aim in "Scoop and Run" treatment is generally to transport the patient within ten minutes of arrival, hence the birth of the phrase, "the platinum ten minutes" (in addition to the "golden hour"), now commonly used in EMT training programs. The "Scoop and Run" is a method developed to deal with trauma, rather than strictly medical situations (e.g. cardiac or respiratory emergencies), however, this may be changing. Increasingly, research into the management of S-T segment elevation myocardial infarctions (STEMI) occurring outside of the hospital, or even inside community hospitals without their own PCI labs, suggests that time to treatment is a clinically significant factor in heart attacks, and that trauma patients may not be the only patients for whom 'load and go' is clinically appropriate. In such conditions, the gold standard is the door to balloon time. The longer the time interval, the greater is the damage to the myocardium, and poorer is the long-term prognosis for the patient. Current research in Canada has suggested that "door to balloon" times are significantly lower when appropriate patients are identified by paramedics in the field, instead of the emergency room, and then transported directly to a waiting PCI lab. The STEMI program has reduced STEMI deaths in the Ottawa region by 50 per cent. In a related program in Toronto, EMS has begun to use a procedure of 'rescuing' STEMI patients from the Emergency Rooms of hospitals without PCI labs, and transporting them, on an emergency basis, to waiting PCI labs in other hospitals.

Although a variety of differing philosophical approaches are used in the provision of EMS care around the world, they can generally be placed into one of two categories; one physician-led and the other paramedic-led with accompanying physician oversight. The **Franco-German** model is physician-led, with doctors responding directly to all major emergencies requiring more than simple first aid. In some cases in this model, such as France, paramedics do not exist at all. The team's physicians and in some cases, nurses, provide all medical interventions for the patient, and non-medical members of the team simply provide the driving and heavy lifting services. In other applications of this model, as in Germany, a paramedic is present, but is sharply restricted in terms of scope of practice; often not permitted to perform Advanced Life Support (ALS) procedures unless the physician is physically present, or in cases of immediate life-threat. Ambulances in this model tend to be better equipped with more advanced medical devices, in essence, bringing the emergency department to the patient. High-speed transport to hospitals is considered, in most cases, to be unnecessarily unsafe, and the preference is to remain and provide definitive care to the patient until they are medically stable, and then accomplish transport.

The second model, the **Anglo-American** model, utilizes trained technicians/ paramedics, to staff ambulances. In this model it is rare to find a physician actually working in the pre-hospital setting. More typically, they provide medical oversight for the work of emergency medical technicians and paramedics, which may be accomplished off-line (using protocols or 'standing



orders'), or on-line medical control (technician in contact with the physician, usually over mobile-phone). Patients may be treated at the scene up to the level of the technician's skill set, and then transported to hospital, but in many cases, the limited skill set of the technician and the needs of the patient will result in the rapid and timely transport of the patient to a hospital, at which point definitive care will begin.

## 2. Models of EMS in India

In India, EMS is a relatively new concept, where the most dominant model is the EMRI services. As of December 2009, more than 2,600 ambulances are operating under EMRI across around 10 states in India. Some other states like Bihar, Kerala, Himachal Pradesh and Delhi, have adopted EMRI-like model, but have some other agencies operating the EMS in those states. States like Madhya Pradesh and West Bengal had opted for basic transportation services (without stabilization care) in the PPP mode through multiple agencies (mostly NGOs) contracted at district/block level.

The central government support to the above mentioned schemes is mainly in the form of capital expenditure (capex) support. Operating expenditure (opex) is borne by the states, with the central support being progressively reduced from 60% of opex to begin with, to zero by the 3<sup>rd</sup> year of operations. For the year 2010-11, total of Rs. 227.10 crores have been sanctioned under NRHM for 11 states (including 4 EAG states and 2 North-Eastern states) – for Emergency Referral Transportation System (ERTS), mostly through EMRI in PPP mode.

Some of existing models of EMS being implemented in various states is explained below.

### 1) EMRI “108” Model (*Comprehensive EMS model*)

The most widespread Emergency Response Model in India is the ‘108’ Emergency service managed by EMRI (Emergency Management and Research Institute) across ten states. EMRI began operations in Andhra Pradesh on April 2, 2005 with a fleet of 30 ambulances across 50 towns of the state. It is responsible for handling medical, police and fire emergencies through the 108 Emergency Service. Presently EMRI has its operations in 10 states with 2,601 ambulances in Andhra Pradesh (752 ambulances), Gujarat (403 ambulances), Karnataka (408 ambulances), Tamil Nadu (385 ambulances), Goa (18 ambulances), Madhya Pradesh (55 ambulances), Rajasthan (164 ambulances), Assam (280 ambulances), Meghalaya (28 ambulances), and Uttarkhand (108 ambulances).

The “108 Ambulance Service” is a Public Private Partnership model between state governments and Emergency Management and Research Institute (EMRI) and the service provides complete pre-hospital emergency care from event occurrence to evacuation to an appropriate hospital. The concept of “108 Ambulance” aims at reaching the patients/sites within 20 minutes in urban areas and 40 minutes in



rural areas and that the aim is to shift the patient to the nearest hospital within 20 minutes after reaching him/her. The emergency transportation is conducted in a state-of-the-art ambulance, which is provided free. The transportation is coordinated by a state-of-art emergency call response centre, which is operational 24-hours a day, 7-days a week. In addition, the call to the number 108 is a toll free service accessible from landline or mobile. The ambulances have been designed with a uniquely Indian perspective and it includes space for the patient, paramedic in the back and also bench seat for family members. EMRI ambulance fleet includes Basic Life Support ambulances (BLS), Advanced Life Support ambulances (ALS). The ALS ambulances are available with cardiac monitor and defibrillator in addition to the basic provisions of a BLS ambulance. The Emergency Response System (ERS) implemented by EMRI also includes trained human resources from the call centre staff to support staff in ambulances. Each ambulance has three pilots (drivers) and three EMTs who work in pairs of two for every 12 hour shift with a break every fourth day. For every 15 ambulances there is one operation executive and one fleet executive. Above them there is one district manager and one administrative officer, for every district.

One of the key functions that EMRI performs is to recruit private hospitals who would participate in the ERS and this would imply cashless service for the first 24-hours till the patient is stabilized. For this purpose EMRI has signed MOUs with large number of hospitals to formalise an understanding that the hospital would not refuse admission if a patient is brought to it.

The financing of EMRI in the initial years including capital or operational from the central government expenditure routed through the NRHM flexible pool. The government provided 100 per cent capital expenditure for procurement of ambulances and infrastructure and also provided 95% of operating expenses. The rest five per cent contribution comes from the private partner EMRI as their share in the PPP initiative. But from the year of 2009-10 onwards, in the first year the state would have to bear 40 per cent of operational cost, 60 per cent in the second year, 80 per cent in the third year, and 100 per cent thereafter. The operating costs are currently approximately Rs. 15 to Rs. 17 lakhs per ambulance per year (including an annualised replacement cost of approx. Rs. three to five lakhs per year).

## **2) Janani Express Scheme (*non-EMS, merely transportation model*)**

The *Janani Express* scheme launched by the Department of Health and Family Welfare, Government of Madhya Pradesh (MP), on August 15, 2006 as a strong and innovative measure aimed at addressing the delay factor affecting MMR and the IMR, as envisioned by the National Rural Health Mission. The understanding behind it was that MP is not only the largest state in terms of area but also dominated by tribal areas with poor connectivity and inaccessibility to the cities/towns.

The *Janani Express* scheme is a Public –Private partnership model, where the contract is signed between the Government (at the district/block level) and the private vehicle provider who is generally a local transporter. The *Janani Express* is basically a vehicle (four wheeler – jeep/Tata Sumo/Mahindra) hired locally for a period of one year, to ensure provisioning of 24-

hours transport availability at the field level (Block level) in order to bring the pregnant women to the health institutions. Transport is made available in the area served by a government hospital, CHC, and PHC. The Rogi Kalyan Samitis (RKS) of the concerned health facility plays a vital role in all issues related to the contracted vehicle and all reimbursements and the monitoring and control of the scheme is with the respective RKS. There is also the provision of performance based incentives to the transport agency.

Though the State Health Society (SHS) of MP frames the standard contract document and lays down certain guidelines on the vehicle specifications and sharing of responsible, the actual contract is signed between the district level authorities with the private transport agency. The invitations are called for by releasing an open tender as per the guidelines laid by the SHS and accordingly the transport agency is selected. The term Ambulance has purposely not been used and the term *Janani Express* has been coined for the vehicle so as to avoid people confusing it for an ambulance; as it does not have all the facilities a typical ambulance is ought to have. The primary aim is to provide a means for safe transportation. Also, the primary purpose of the scheme is to promote institutional deliveries and in case of need, it may be used for other purposes listed in the guidelines. Monthly supervision is done by the ANM in their respective area to make it sure that the vehicle is made available one day prior to the date of delivery.

### 3) Bihar Model: “102” and “1911” (mix of EM and basic transportation model)

In Bihar, the ambulances and respective hospitals are connected through a toll free number – “102”. In addition to this, doctors are also empanelled, who would provide services on conference call and also would visit the patients who needed immediate doctor’s assistance (using another toll free number – “1911”). The calls can be transferred from 102 to 1911. Details of the empanelled ambulances and hospitals are provided to the control room operated by IT managers who would contact the ambulance at the time of emergency. The State Health Society of Bihar (SHSB) under NRHM is the nodal agency for 102 control room. The SHS, along with District Health Society (DHS) has district wise empanelled list of ambulances (who are functional at that point of time) with their driver contact details and also enrolled ambulances from interested not-for-profit NGOs. The onus of maintenance and management of ambulances is with the respective owners. The ambulance operators charged user fees for the services provided, which ranged from Rs 75 to Rs 200 (Rupees per 10 kilometers, in respective areas/districts), with exemption to BPL Population (applicable for both private as well as government ambulances). The amount collected through government ambulances is pooled into the RKS fund of the respective hospital where these ambulances are located. In case of private ambulance, the amount collected is retained and utilized by the private operator. The role of private sector is two-fold – control room management and ambulance provision. The nodal agency



monitors the management of the control room and also performs the regulatory role.

#### **4) West Bengal Ambulance PPP Model (*non-EMS, merely transportation model*)**

Another model of emergency transport is contracting out of the management and operation of Ambulance services to various NGOs/CBO's/Trusts under PPP arrangement in West Bengal. In this PPP model the state government procured and equipped ambulances and handed them over to selected NGOs, keeping the ownership with itself. This was facilitated by entering into agreements with various NGOs/CBO's/Trusts by the respective District Health & Family Welfare Samiti (DHFWS) for a five-year period. These NGOs then operate the ambulance in the designated area on a user-fee basis. The DHFWS fixes the user charges and these can be retained by the NGO's for meeting the recurring expenditure. The monitoring of the program is done by Block Health and Family Welfare Samitis (BHFWS).



#### **5) Referral Transport System in Haryana (*trauma/highway ambulance*)**

To reduce the maternal & neonatal deaths the Government of Haryana has launched a unique scheme to provide referral transport service branded as “*Haryana Swasthya Vahan Sewa No.102*” on 14th November 2009. All the 21 districts of Haryana are covered under the scheme.

The scheme offers (a) Transportation from the site of accident or home or any other place to nearest appropriate Medical Facility in case of medical need, and (b) Transportation from a Medical Facility to a higher medical facility. Free transportation Services are provided to pregnant women, victims of road side accident, patients belonging to BPL or notified slums, post natal cases in case of emergency (till 6 weeks after delivery), neonates in case of emergency (till 14 days after birth), freedom fighters and ex-defence personnel. For all other categories of patients, user-fees are charged which amounts to Rs 7/per kilometer.



The scheme is run by the government in collaboration with District Red Cross Societies and toll free telephone number “102” installed at each district control room for easy access to the public. There exists a 24x7 Control Room in each district hospital, for receiving the calls and monitoring of ambulances through GIS/GPS. There is common pooling of ambulances belonging to the Health Department as well as those owned or operated by the District Red Cross Societies. The operating cost for ambulances run by District Red Cross Society is reimbursed to them by the government.

### 3. Proposed EMS for India

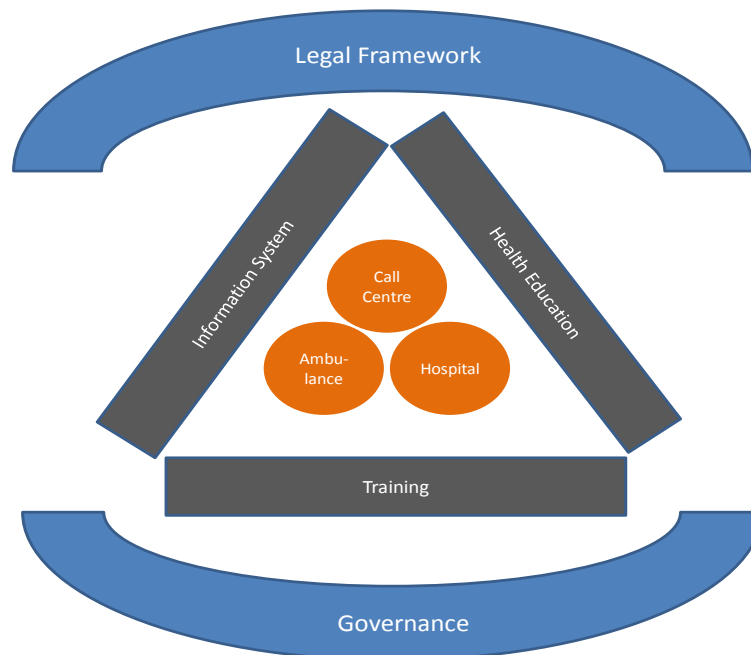
As discussed in the previous section, many states in India have already initiated various models of EMS, mainly involving timely transportation of emergency cases. Most of these initiatives have been supported under NRHM, and states also have share in the expenditure. The focus had been on encouraging states to develop their own solutions and models of EMS, based on local needs and available health infrastructure.

In light of the above, the proposed EMS for India is not a strict centralized system, but a loose conglomeration of state initiated systems, with a common set of monitoring and governance tools for comparability and transparency across the country. The essential components of the nationwide EMS, which would constitute of state based schemes/initiatives, are discussed in details below.

#### Components of proposed national-wide Emergency Medical System (EMS)

There are certain core elements in an EMS like the ambulance operations, call centre, and the treating hospitals/health facilities. These work in an environment that includes elements like information system, health education and training, legal environment and governance system. The components are shown diagrammatically in the figure below.

**Figure 1: Components of EMS**



As depicted in the above figure, the core elements of ambulance transporting the patients to the hospitals, coordinated by the call centre, would be linked in real-time through information

system, using multi-mode and multi-channel media. This needs to be supported by well trained healthcare providers, both the in ambulance as well as in the hospitals, and also by aware members of the public (on the road, in workplaces, at home – made aware through targeted health education). For overall transparency in operations and fairness in service provision, an overarching legal and governance framework would be needed. The detailed description of the components of the proposed nation-wide EMS in India is given below.

1. Ambulance – operations and maintenance
  - Procurement – needs standardization across the country regarding specification and of vehicles and equipments
  - Contracting – standardized contracting/tendering process including common template of tender documents and contracts
  - Procurement of vehicles and operations & maintenance (O&M) can be combined in a single contract or may be undertaken separately, as per the capacity and choice of states
2. Call Centre
  - Common toll-free number across the country, preferably “108” – to be owned by the central government and not owned/patented by any private party/organization.
  - It may be combined with the O&M contract, or may be contracted separately
  - Needs standardized protocols of operations including for call processing, screening, ambulance dispatch, follow-up, voice recording etc.
3. Empanelled health facilities/hospitals
  - Need separate MOUs, which may be bi-partite (between ambulance operator and hospital) or tri-partite (between state govt., hospital and ambulance operator). Both public and private health facilities/hospitals may be empanelled based on common and transparent criteria.
  - Facilities not to refuse patients before stabilization. Clinical indicators of “stabilization” to be defined for various types of medical emergencies.
  - Facilities may be separately identified for different types of medical emergencies (like for maternal and neo-natal cases, pediatric emergencies, cardiac emergencies, strokes, road traffic accidents and trauma, burns and injuries, etc.).
  - Accreditation to be based on guarantee of physical infrastructure (including equipment, beds, ICU/CCU/Trauma care facilities, blood bank, etc.), qualified and trained staff, availability and adherence to SOPs for emergency case management. The accreditation may be periodically renewed, based on compliance to above requirements
  - Quality – regular medical (clinical and outcomes) audits, internally (by the facility) and by third party. Renewal of accreditation to be based on these audits.
4. Information System and Knowledge Management
  - Real-time data management through multiple media and multiple channels – using voice recording of calls and directions (given by call centre to ambulance/patient/attendant), trip records filled by drivers, case sheets filled by emergency technicians and treating doctors, follow-up calls, etc.



- Call centre to coordinate using interactive GIS software, integrated with ambulances and empanelled facilities/hospitals. Hospitals to be informed beforehand on type of cases, requirement for blood, etc. Public Emergency Management agencies like Police and Fire Service, also to be integrated in the real-time information system for guidance, monitoring and other necessary actions.
- Software copyright to be purchased by the central government and for “public” use. The states may not need to “buy” the original software or modifications thereof.
- Defined set of performance indicators, standardized across states (separately for ambulance operators and accredited hospitals), to be generated periodically (monthly, quarterly, annually) and put in public domain (only aggregate data, not individual case records – through website, published reports, advertisements in mass media, etc.). Databases to be maintained at individual facility, city, district, state and national level.
- Third party data validation and outcomes evaluation, at least annually.

#### 5. Training

- Formal courses and training institutions to be accredited under suitable state/national level medical/para-medical council(s). The institutions providing such courses may include medical colleges, nursing colleges, paramedical training institutes, polytechnic colleges, etc.
- Standardized faculty development program may precede accreditation of such courses.
- All existing government health staff involved in clinical case management may be trained in emergency management in phases. Private health providers/ nurses/ technicians may be included in such trainings on payment of requisite fees by the individual or the employing hospital.

#### 6. Health Education

- Certificate courses on emergency management/first aid may be started through Red Cross/Civil Defence/Police/Fire Service/Armed Forces, etc. for general public, with special focus on Civil Defence volunteers, Scouts & guides in schools, NCC cadets, NSS volunteers, etc.
- Special training drive for rickshaw, auto-rickshaw, cab/taxi, bus and truck drivers, at city/state level.
- General IEC through mass media on emergency management/ resuscitation/ first aid, for the general public.

#### 7. Legal framework

- Legal framework needed to define the contractual liabilities of all stakeholders (individuals and agencies/hospitals). To this effect a draft “Emergency Medical Services” Act may be developed by the central government for all states (as of now only Gujarat has an Emergency Medical Services Act, which may be studied for this purpose).
- The states may move step-by-step to a comprehensive legal framework, starting from a state-wide EMS Policy, developing and operationalising procedures and

guidelines for implementing that policy; and finally at a later stage the need for an Act may be weighed and appropriate legislations enacted.

#### 8. Governance

- The EMS may be managed and supervised at the state level by a State EMS Trust, which may include representation from government agencies (health, police, fire, etc.) and other stakeholders (ambulance operators, private hospitals, insurance companies, civil society organizations, etc.); under the chairmanship of an appropriate authority (Health Secretary or the Chief Secretary).
- The National EMS Trust may be federation of State EMS Trusts under the chairmanship of an appropriate authority like the Health Secretary.
- The Trust may overlook the functioning of the EMS at state level, including procurement, tendering process, empanelment and accreditation processes, review of O&M, Quality, Health Education and Training. The Trust may also oversee the strengthening of emergency case management facilities in the public hospitals (including trauma units, ICU/CCU, blood bank, etc.). It may also steer the inter-sectoral coordination with other government departments and agencies.

The states may also look at special provisions and conditions to be covered under the proposed EMS and integrated with the existing system in the near future. This may include SOPs for responding to natural calamities and disasters, responding to events of public violence (like riots), terrorist and disruptive activities (like bomb-blasts), industrial accidents (like the Bhopal gas leak), and also to respond to possibilities of NBC (Nuclear Biological Chemical) attacks.

#### **Financial implications**

The financial implication of the above proposed EMS for all states in India is discussed below.

- It is proposed that the central, under NRHM, may bear the capital cost of the EMS designed and planned by respective states, including the capital replacement cost every three to five years, and also the cost of setting up the call centre and its related hardware and software (including GIS software). The operating costs may be progressively borne by the states, through their own funds.
- Operating costs are currently approximately Rs 15 to Rs 17 lakhs per ambulance per year (including an annualised replacement cost of approx. Rs. 3 to 5 lakhs per year). These costs could be expected to rise further. Thus the currently estimated Rs. 1700 crores required per year for a projected fleet of 10,000 ambulances needed nationwide (accounting for around one ambulance per lakh population) could finally be two to three times this amount.
- In a scenario where the commitment to raise health care expenditure to 3% of the GDP is adhered to, this Rs 1700 to Rs 3000 crores commitment would help reach this goal.
- The above cost estimates do not include financial implications of increased training and health education, and infrastructure strengthening needed for public hospitals for managing medical emergencies.



## **Linkages with other systems/schemes**

There are various other central and state government schemes and facilities that are already in place and have direct bearing on any new EMS being proposed. Hence the EMS need to build linkages with these schemes and facilities, as discussed below.

- Existing fleet of ambulances (government owned and private) may be integrated with the EMS. Government owned ambulances, especially at secondary and tertiary level hospitals may be converted to Advanced Life Support (ALS) standard, exclusively for inter-institution transfers.
- Financing of private individual private ambulance operators may use funds available under JSY and Emergency Transportation Schemes under RCH-II/NRHM.
- There is also a scope to integrate such emergency transportation services within the framework of RSBY (or other such schemes), to establish links with identified hospitals to provide emergency care and also for payments (RSBY already has provisions for reimbursement for transportation).
- Facility up gradation in public hospitals for trauma units, ICU/CCU, blood bank, etc., may be undertaken under NRHM and other central government schemes.

The central body/Trust, governing the all-India conglomeration of EMS in various states, may also facilitate common learning across the facilities and assist the states by making available common tools and templates of SOPs, specifications of vehicle and equipment, tender documents and contracts, making available common software for information and knowledge management, etc. Also there can be central knowledge platform like website and reports/publications, where common indicators (clinical, public health, operational and financial indicators), along with other details of the components and operations can be made available to the public as well as to policy makers and managers/professionals.

## References

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