STABILIZING THE EMERGENCY MEDICAL SERVICES IN INDIA
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Executive Summary

Trauma has become a leading cause of death and disability in India with significant adverse impact on the overall economy and on the affected households. While primary prevention is a key, international research shows that strengthened and better organized trauma care systems increase survival rates and reduce long-term disability.

The objective of this paper is to analyze four options for the provision of emergency medical services in India at the request of the Government of India. The four options include provision of EMS by: a) Government Health Department; b) Local Fire Services; c) Not-For-Profit Organizations, and d) For Profit Private Hospitals.

We evaluated the options on the criteria of efficiency, equity, feasibility and quality. Our analysis shows that the status quo option, i.e. provision by non-profits, remains the best along all the evaluation criteria. However, to make it more effective and efficient, the Government of India should undertake steps to create a legislative framework to regulate the provision of EMS in the country and encourage more competition. It should also correct the current principal-agent problems by putting in place effective monitoring and fiduciary arrangements and building internal capacity to oversee the performance of non-profit providers on a regular basis.

The paper starts with an introduction on the status of trauma in India. We then provide the definition of emergency medical services and explain the rationale for government involvement in the sector. We continue with an overview of existing international practices to show the variety of arrangements that emerged in different parts of the world. A brief overview of EMS in India and its current problems is followed by the description of the policy goal, evaluation criteria and of policy options. We conclude with the analysis of the four options along the evaluation criteria and the recommendations.
Introduction

Trauma has become a major cause of death and disability worldwide. It causes more than five million deaths each year and 90% of these deaths are in low- and middle income countries (LMICs). Estimates from the Global Road Safety Program indicate that the costs of road traffic incidents (RTIs) alone stand at 1% of the global GDP. This has a serious impact on the affected households. Nearly 75% of RTI victims are earning members and 9%–45% are sole earners of their households. (Global status report on Road Safety, WHO, 2009).

The situation in India is more dramatic. The rate of disability increased from 1.9% in 1991 to 2.1% in 2001 (Indian Census, 2001). Injuries are directly responsible for one-third of disabilities in the country. (National Sample Survey Organization (NSSO) 1994, (Suresh 1997). Based on this estimate, nearly 70 lakh people are disabled due to injuries.

The economic impact of trauma is also high in India. A recent study by Mohan (2004) estimated that the economic impact of RTIs was Rs 55,000 crore or nearly 3% of the GDP. RTIs were also shown to have a larger impact on poor households. For example, a population-based survey in Bangalore showed that the incidence of mortality due to RTIs was 31 per 100,000 in poor communities compared to 17 per 100,000 in non-poor communities (Aeron, Thomas et al. 2004). The incidence of serious injuries was also higher in poor communities (238 v. 186 per 100,000).

There are significant differences in trauma survival rates in countries at different economic levels. A study of severely injured persons found that the mortality was 35% in US; 55% in Mexico and 63% in the low-income Ghana. The chances of survival are almost twice lower in a poor country compared to a rich one. The difference is even larger in instances of life-threatening, but salvageable injuries. Here the mortality rate is six times higher in low-income countries (36% mortality) as opposed to high-income countries (6% mortality). (Health Systems; Emergency Care Systems, Report by Secretariat, WHO, 2007)
Improvements in the organization and planning of emergency medical services were shown to result in survival gains between 8% and 50%. The rallying call to improve emergency care systems worldwide was launched on May 23, 2007 when the World Health Assembly (WHA) adopted Resolution # 60.22 ‘Health Systems: Emergency Care Systems’ which urged national governments to adopt measures to strengthen emergency care services as an important instrument to reduce mortality and morbidity due to trauma.

**What Are Emergency Medical Services?**

Emergency medical services address situations that result in sudden bodily harm due to injury and other urgent medical conditions. The emergency medical services include the evaluation of the person in the distressed condition, the provision of appropriate pre-hospital care and transportation to an appropriate hospital for the provision of definitive care.

Emergency medical care has its greatest impact within several hours of the event when it can prevent death and life-long disability. To stress the importance of timely care, the field developed the term of ‘golden hour’ (Kobusingye, Hyder, Bishai, Joshipura, Hicks, Mock, 2006). The success of the case depends on accessibility, timely reaction, appropriate stabilization of the condition and rapid delivery of the patient for professional treatment. Therefore, in the success of EMS policies depend on efficient communication systems, transportation and supplies, trained personnel as well as coordination of all involved parties. Moreover, the EMS services are expensive and should be available to everyone.

**Why Should the Government Get Involved in Emergency Medical Services?**

The majority of health services are private goods supplied in private health care markets in rich, and increasingly in middle-income and low-income countries. Similarly to
other markets, government intervention in health services markets on efficiency grounds is justified in case of market failure. The market failures are usually related to public goods, externalities and incompleteness in insurance markets. (WDR, 2004)

The externalities associated with emergency medical services are psychological in nature. The utility of most (altruistic) people increases when individuals around them irrespective of economic status consume at least the minimum level of medical services. In the case of emergency services, most people, for example, would not feel at ease if emergency care were to be denied to another individual based on inability to pay, especially if the person was not the primary cause of the emergency situation (Zwifel, Breyer, Kifmann, 2009). Emergency medical services also display the features of a quasi or non-pure public good¹. While it is possible, in principle, to exclude the individual from the service when it is set up, it is difficult to do so in practice on humanitarian grounds. Indeed, even in the most market-oriented health sector in the United States, emergency care is not denied under any circumstance.

On the supply side, however, it is still possible to argue that there is no need for Government intervention in either financing or provision of emergency medical services as insurers can negotiate for their provision. (Zweifel et al., 2009). The general counter-argument, of course, is the adverse selection in insurance markets, underinsurance or almost total absence of insurance markets. This is particularly true in a developing country context. In India, for example, less than 9% of the total population is insured (Rawdwan, 2005).

The government may intervene in the health services on equity and poverty reduction grounds even under circumstances of no obvious market failures. Costly medical services

¹ For an interesting perspective on public goods see
http://www.economist.com/blogs/democracyinamerica/2009/10/universal_health_insurance_is
may result in under consumption by the poor putting in jeopardy their main productive asset– labor (WDR, 1993).

Therefore, another view is that there is significant room for government intervention, especially in a developing country context. This includes direct government provision although alternative models of delivery involving contracting out to both for-profit and non-profit providers are also increasingly used. (ADB Handbook for the Economic Analysis of Health Sector Projects, 2000). Finally, history suggests that even in a developed country context governments played a crucial role in creating emergency medical services systems that were underprovided in a market setting.

While we may preliminarily conclude that the Government has a role to play in the area of emergency medical services, its exact role as well as the design and arrangements to provide emergency medical services vary from country to country and in a large country like US from state to state. We will provide an overview of existing arrangements in the following section. Hopefully, this will help us draw some lessons that could be applied in the Indian case.

**How should the Government Get Involved?**

To start with, the Government should implement policies that provide effective, quality service - i.e. to ensure that patients is timely reached, appropriately triaged and rapidly delivered to hospital for professional treatment. Moreover, we are looking for the service that is cost efficient in implementation, maintenance and development. Since provision of EMS has positive externalities and no person should be refused the care, we will draw the attention on the equity of the solution.
**Running effective EMS**

The quality of services and effectiveness of the EMS depends on four key factors:

1. **Efficient communication systems** – both with patient, transportation and hospital.
2. Well trained emergency care personnel who can assess the condition correctly and stabilize the patient to increase chances of survival;
3. Efficient transportation systems, appropriate equipment and supplies;
4. Constant coordination of procedures with hospital care providers.

**Efficient communication systems:** Pre-hospital EMS communication system provides the link and feedback with the patient as well as information exchange with transporters, EMS care providers and hospitals, moreover it has to assist the dispatchers in decision making about the most appropriate care strategy for the specific case. To fulfill its duties, the EMS communication systems depend on the use of ICT. Therefore their operations are asset-intensive and require the unique competences. As a result, the parties, who heavily invest in the most advanced dispatch centre technology, enjoy the status of natural monopolies over the territory. Hence, while planning the government intervention, the attention should draw on X-inefficiencies, marginal-revenue pricing efforts and Principal-Agent problem in the arrangement.

**Well trained pre-hospital care personnel:** Skilled care personnel insure the smooth and rapid management of the EM process as well as appropriate triage and pre-hospital care of the patient. While the EMS provider should ensure that care providers have appropriate training programs and skilled employees, these competences it do not provide monopoly position to specific market players and does not create significant, unique competitive advantage, because of uncomplicated set-up and labor mobility. The Government should state
the minimum standards to reduce the harmful experience and post-experience of the service recipients.

**Efficient transportation systems, appropriate equipment and supplies:** Transporting a patient from the site of trauma to a hospital facility is a critical element of the pre-hospital component. Lack of transportation is often a major barrier to accessing emergency care (Kobusingye, Hyder, Bishai, Joshipura, Hicks, Mock, 2006, p.1267). The geographic locations of the fleet(s) should be adjusted to ensure appropriate arrival time on the scene and rapid delivery of the patients to the hospital. Moreover the vehicles should be equipped with the devices and materials for basic and(or) advanced life support. While the costs of the vehicle fleet can be substantial (15,000$ - 30,000$ each, in India), they do not guarantee monopoly position for the provider of transportation, since medium-term contracts can be made with different competitive players over the same territory and marginal procurement can shift-out existing providers. Again, due to possibility of harmful experience and post-experience the Government should state the minimum standards for the service.

**Constant coordination of procedures with hospital care providers:** As experience of Japan suggests, poor coordination of pre-hospital EMS units with hospitals can increase transfer time two- or threefold (O'Malley, O'Malley, 2006). The WHO suggests (Guidelines, 2004, p.76) to establish pre-existing transfer agreements with hospitals as well as to develop protocols for transporting patients to most appropriate (closest, available, appropriate care level and specialization). The involvement of the Government could be regulatory by including the cooperation protocols in service standards.

**Addressing Equity Issues**

The humanitarian aspects and negative externalities of trauma to the society does not allow letting anyone outside emergency care - it should be horizontally equitable. At first it
should include penurious population, (Kobusingye et al., 2006, p.1272) even suggests that EMS in low-income countries primarily must be pro-poor in their orientation, focusing on overcoming the barriers to acute care for the poor.

Moreover, there are substantial challenges within the rural EMS systems due to low patient turnout and therefore high costs for providing EMS care to sparsely populated regions. Therefore Government has to address the issue of 'geographic equity' by directly subsiding rural operations or setting the regulation that requires market players to crosssubsidize the countryside operations from their income in urban areas.

Running Efficient EMS

To solve the problems of equity, adverse selection and underinsurance, the most governments have decided to finance EMS at least partly. Therefore, it is important to maximize efficiency of invested public resources.

The key approaches, therefore, are:

- to introduce the competition in every piece of the EMS system, where it is possible, e.g. in transportation, between hospitals, training of staff etc;
- to reduce incentives of monopoly pricing of the players that are in monopoly situation, e.g. dispatch centers;
- to reduce X-inefficiencies and Principal-Agent problem in all players that are not driven by competition (monopolies, government agencies, Not-for-Profit organizations);
- to lover burden on the public budget, Governments chose to explore other financing options - e.g. introducing compulsory insurance or including EMS costs in highway projects etc (tax on projects).

Moreover, governments should encourage private EMS for serving affording section of the society, therefore easing burden on budgetary resources. Also, to ensure vertical equity,
governments could require to cover (partially) case's costs from the clients who are able to pay. These incentives, thus, will help to develop the health insurance market.

To overcome the coordination problems between various EMS service providers and to address the funding problems, as well as to assure the coordinated and sustainable development, the WHO calls for establishing the intersectoral coordination mechanisms (WHA, 2007). Therefore many countries consider establishing national EMS coordination boards or agencies with responsibilities ranging from policy setting to implementation and coordination.

**International practices of managing EMS**

The organizational models of the EMS differ from country to country. Each model specifically fits the historical development and current state of the health care system in whole, economic and geographic conditions as well as country’s unique approach to the EMS. While the literature does not suggest that there is the best model for organizing EMS (as soon as it satisfies the factors described above) we list the most widespread ways of managing the pre-hospital EMS.

**Access and dispatching**

To ensure easy access to EMS, most countries have established single state-wide emergency number that is routed to pre-assigned EMS system’s dispatcher(s) directly or via Integrated Emergency Dispatcher (e.g. EU 21 of 29). Some countries have established single national EMS dispatcher to avail of efficiencies of scale for using the technology and competence, while others run inter-connected regional and sub-regional (municipality) centers. E.g. the US’s 911 system is local based and operated with over 6,000 answering points (Board on HCS, p. 151). Dispatcher services (dispatching or call routing) can be organized also by the
Police or Firefighters. Integrated Emergency Dispatchers usually have medical staff to assist EMS decisions.

Meanwhile, there are countries with several providers of EMS, each running his own emergency numbers and dispatching centers – e.g. Red Cross, hospitals and police’s EMS divisions in Mexico (Garcia-Rosas, Iserson, 2006), sub-regional dispatchers in Peru (Swanson, Morales, Villafuerte, 2005). Though, the respective countries consider this practice to be inefficient and plan to implement the central nation-wide dispatcher system.

**Service providers**

In US 35% of EMS fleets are run by for-profit entities, 39% by firefighters, third service agencies (12%), nonprofit (5%), public utility (5%), hospitals (3%) and 1% by volunteers (Work, 2005). Mixed models are successful and used widely – e.g. in US firefighters provide primary service and involve private ambulances if necessary; Belgian state, Nokia and private ambulances running highly technological solution (Work, 2005).

If the service is provided by police or firefighters, the personnel is accordingly trained and supplied with the necessary equipment (Swanson, Morales, Villafuerte, 2005). The fragmented systems work well as long as services are provided within one local jurisdiction, however cross-regional incidents expose the absence of common operating procedures and often result in inconsistency of care (California, 2003).

**Financing**

The cost of maintaining an EMS system in a state of readiness is extremely high (Board on HCS, p.41). The financing models varies greatly from local governments levying special EMS taxes (Municipal Research, 2009) to state supported EMS systems, to patient billing by private EMS providers and insurance coverage.
E.g. US models include full spectrum of financing sources - municipality contracts a private ambulance company to provide EMS services, the company then bills the patient or insurer. The town may partially subsidize the ambulance or the company may be asked to pay for the opportunity to provide EMS services. Also state and federal level grants are provided for equipment acquisition and maintenance, communications systems, personnel and education etc. Federal Medicare system covers the expenses of its clients (Pozner, Zane, Nelson, Levine, 2004). In EU 19 states run state-financed EMS systems, 11 are financed by other public agencies and 4 also have elements of private services. (WHO Europe, 2008).

To overcome the equity problems, most of the countries have established legislation or financing principles that guarantee care for everyone. E.g. Mexican Constitution guarantees a general right to health care – poor patients receive emergency treatment at state-run hospital (Garcia-Rosas, Iserson, 2006); Denmark guarantees access to health system for everyone, while private hospitals provide higher service level and avoid waiting lists (Christiansen, 2002).

**Brief Overview of Emergency Medical Services in India**

**Passive Government Failure**

Indian health authorities largely ignored the problem of high morbidity and mortality due to trauma and injury. As recently as 2004, Joshipura, HS Shah, PR Patel, PA Divatia mentioned that ‘there is no central government agency to integrate policy-making, planning, financing, drafting legislation or establishment of minimum standards for the performance of a trauma-care system. No reliable institutional arrangement exists to lead the development of such a system in any Indian state. There was no legislation in place to specify the
qualification requirements of existing ambulance staff and equipment (Joshipura, Shah, Patel, Divatia, 2004).

With the notable exception of Delhi and Gujarat state which guarantee EMS services to their populations, emergency medical services systems were virtually non-existent in India. They were absent in rural areas and the rudimentary ones that existed in urban areas were scattered in different states and mostly supported by non-governmental and private institutions (Joshipura et al., 2004).

Some progress was had been made recently on the legislative aspects with the adoption of the EMS Bill in the state of Gujarat in 2007. The Government of Delhi came up with the first ‘Ambulance Standards’ in the country in the same year. In parallel, the Ministry of Road Transport and Highways formed a committee to lay down the guidelines for Trauma Care on Highways and allocated Rs. 732.75 crores for a five-year period until 2012.

While all the legislative initiatives are noteworthy, what really put the EMS on the map in India was an initiative that started in the not-for-profit sector and led to the emergence of a single provider of emergency medical services in several large Indian states.

**Emergence of a Promising Public-Private Partnership Model**

In 2005, recognizing the growing need for EMS services, two brothers, Ramalinga and Ramu Raju, founded an non-profit organization ‘Emergency Management and Research Institute’ (EMRI), and funded the initial fleet of 70 ambulances with own capital.

The software company background of the brothers helped them develop a modern GPS-based emergency response model that could handle 200,000 toll-free calls daily round the clock. They subsequently obtained a single, toll-free number that was reserved for emergency and disaster management by the Government of India and signed a Memorandum
of Understanding with the government of Andhra Pradesh (AP) to create a private-public partnership to provide free emergency care to the entire population of the state (Ministry of Health and Family Welfare, Study of Emergency Response Service – EMRI Model, 2009).

The model seemed to work well. It operated from a central emergency response center. The modern technology helped track the location of emergency calls and nearest ambulances. This resulted in reduced response time. In addition, the EMRI developed in-house training capabilities for emergency medical technicians (EMT), improving the quality of the pre-hospital care provided. The EMRI-operated ambulances could reach the patient in 15-20 minutes, provide quality emergency care and transport the patient to the nearest hospital in another 20 minutes.

The EMRI gained the trust of both the population, other state governments and national government which committed funds for its operations. In the four years that followed, the EMRI expanded its fleet from the initial own 70 to over 1600 ambulances (financed and owned by states), established links with 6,800 private and public hospitals and provided medical emergency services to a population of 368 million in nine state of the country. Its vision of achieving nation-wide coverage by 2010 seemed realistic and it was increasingly backed up by the government. However, an unexpected scandal put the entire arrangement in jeopardy (Ibid).

The Financial Scandal and the Subsequent Crisis – A Principal-Agent Problem

An allegation of embezzlement of public funds, fraudulent practices, falsification of accounts involving both brothers led to their departure from the organization they founded. This, in turn, prompted the exit of some of the most influential board members and plunged the EMRI into a financial crisis. The senior management went unpaid for months and although its workforce of 13,500 still received salaries paid from public funds, the future of
the organization was far from certain and so was the once promising future of the EMS services in India (Rita Dutta, Express Healthcare, July 2009).

To compound the situation further, the Ministry of Health and Family Welfare of India commissioned a report which identified serious gaps in corporate governance, financial management and procurement systems of the EMRI. According to the report, the government which contributed 95 per cent of the costs had basically no idea how the money was spent. The report also raised the question of the financial sustainability of the operation as the EMRI was spending 10% of the National Rural Health Mission budget in addition to the budgetary support provided by the respective state governments (Study of Emergency Response Service - EMRI model, 2009).

While the behavior of the EMRI founders may be deplorable, the situation represents a classic principal-agent problem which begs the question of why appropriate monitoring and fiduciary arrangements were not put in place by government authorities. After all, non-profits were shown to provide medical services successfully and cost-effectively in other parts of the world (ADB Handbook for the Economic Analysis of Health Sector Projects, pp. 20-26)

**Summary of the Problem**

The lack of a single coordinating agency at central level led to the sporadic and scattered provision of EMS with varying quality standards. The emergence of the EMRI partially addressed the problem of quality and lack of uniformity in pre-hospital care. However, the present arrangement is susceptible to the limitations of natural monopoly and principal-agent problems, and importantly, the financial sustainability is also a cause of concern.
**Policy Goal**

The Government of India would like to overcome the current shortcomings fast. While the partnership with the EMRI is still on the table, the Government is interested in finding ways to address the accountability problems. It would also like to explore a number of available options for the delivery of emergency medical services in India to avoid similar crisis situations associated with single providers. Our team was asked to suggest and evaluate several options in our capacity as objective technicians.

The goal of the Indian Ministry of Health is to develop a sustainable model of emergency care that would provide efficient, equitable and quality care to the citizens of India. The quality of the system will be defined by the provision of timely and appropriate care to the persons in need. By equity we mean that emergency care will be provided to all persons in need regardless of their financial situation. Population coverage as well as vertical and horizontal equity are the impact criteria used to evaluate the equity implications of the options. An efficient system will be a system that will provide care most cost-effectively. We look at the average cost per ambulance, average number of dispatches, the number of trips per ambulance, operational efficiency and the capacity for improvement as impact criteria to assess the efficiency of the four models. The flexibility of the model to attract additional funds from the private sector, scalability and political acceptance are the criteria used to compare the feasibility of options. Cost savings will be meaningless if the quality of the service provided will suffer. Response time, the level of pre-hospital care, geographic coverage, and importantly rural outreach, are the quality dimensions we look at in each of the four options.
Policy Options

In addition to the policy goals, the prospective policy options have to solve the problems of natural monopoly, financial viability and Principal-Agent relationships in current arrangement.

At this point the network of hospitals is established, we have assets (vehicles and equipment) for providing services and also there are existing EMS practices. The main weakness of the system lies within current organization of providing services. Therefore, we propose 4 different models of improved EMS framework:

1) EMS run by Government Health Department;

2) EMS run by Local Fire Services;

3) EMS run by Not-for-Profit Organizations (improved status quo);

4) EMS run by For-Profit Organizations - Private Hospitals.

Regardless of chosen policy option, the implementation should start with development of regulatory framework of EMS services (quality, organization, financing) and should include options for non-budgetary financing.

EMS run by Government Health Department

This is one of the earliest EMS model, which has demonstrated sustainability and increasing utilization of the service by people. The following model is successfully deployed in the state of Dehli.

There will be operationally and budgetary autonomous Dedicated Government Society within Health Department which runs the emergency number and dispatcher centre. It owns ambulances that are located in different points in the state. Agency has contracts with
public and private hospitals. After receiving the emergency call it coordinates with ambulance teams and hospitals. Operations of the agency are financed from the public budget.

To implement this option following key steps should be taken: EMS Society established; state owned assets (ambulances and call centre) transferred from EMRI; contracts signed with private hospitals regarding coordination of emergency cases and EMRI's employees transferred to the new Agency. This option requires purchasing of expensive licenses of the call centre software.

**EMS run by Local Fire Services**

In this model the dispatcher services are executed by the centralized call centers of Fire Service. Service units will be expanded with ambulance teams and supplied with the necessary equipment. The rural location without own Fire Services will be covered by nearby cities. The call centers receive the calls and coordinates with local Fire Service units. Provision of the EMS services is reimbursed on case basis from the public budget. Also budget resources are invested in personnel training and improvement of equipment.

The implementation of the option consists of the 3 activities: taking over the ambulances and equipment; integration of the call centre and emergency procedures; taking over the EMS staff from EMRI.

Meanwhile, Fire Services are organized in different manner in states - some have centralized Fire services, elsewhere they are provided by the Municipal bodies. The expertise & coverage also vary from state to state. Therefore it will be necessary to establish small state level coordinating body, which will sign contracts with hospitals and provide necessary training and coordination.
EMS run by Not-for-Profit Organization (improved status quo)

Currently the model is implemented in 10 of 28 states of India. As shown in the analysis of the problem, the model provides quality services, while its costs are unsustainable.

We propose to enhance the current arrangement by creating national level guidelines to establish service standards and collaboration procedures. Moreover, the Central Coordinating Agency will be established to plan and implement nation-wide EMS policy, to control agreements, oversee implementation of standards and to coordinate financing of services.

Since current contracts with EMRI in states will expire in short (1y) to medium (5y) term, Government should ensure that efficient competition is introduced into EMS market. Therefore, it should draft transparent and fair procurement procedures for auctioning the future provision of services.

The implementation of this model is easiest from the technical and organizational perspective - there is no need for taking over systems, assets, agreements or staff. Also there are no additional costs for the call centre software. Meanwhile, taking into account the serious current weaknesses of the model, it is worth to compare this policy option with others as baseline.

EMS run by For-Profit Organizations - Private Hospitals

In this model we will facilitate the development of private EMS services. To implement the option, regulation of the industry should be established to set the rules for reimbursement from the public budget and the minimum standards for the services. The Government could further facilitate the development of private services by partly funding
investments and training, also by drafting the triage protocol and sample agreements (as templates or regulation) of collaboration with other hospitals, dispatchers and ambulances.

Moreover, the market of EMS services will expand by providing wealthy customers with better and individualized service. The growing provision of private EMS will develop health insurance market.

We expect the private hospitals to form the network of dispatcher services and ambulances to serve the urban areas. Meanwhile, securing services in rural areas is the toughest issue of this option.

**Key attributes of the policy options**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>An autonomous govt society operates Central control room; Health Deptt also upgrades trauma wards of Govt Hospitals</td>
<td>Fire services operate through Fire control room within their jurisdiction; Limited impact on stabilization in hospitals</td>
<td>Not-for-profit organization operates centralized control room; Accesses network of Govt &amp; pvt Hospitals for stabilization</td>
<td>chain of hospitals provide ambulances – High end Trauma wards</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target group</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire population with a focus on poor population</td>
<td>Entire urban Population within utility area</td>
<td>Entire population</td>
<td>Affording section of the society within vicinity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main activity</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS; Convergence with existing health infrastructure</td>
<td>Fire Service; EMS converged with rescue operations</td>
<td>EMS</td>
<td>Secondary &amp; Tertiary Care</td>
<td></td>
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<table>
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<tr>
<th>Present Financing</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgetary support + user charges for non-emergency transportation</td>
<td>Budgetary support + User charges for non-emergency services</td>
<td>Mainly Govt budgetary resources and a negligible private contribution</td>
<td>User Charges</td>
<td></td>
</tr>
</tbody>
</table>
A comparison and Analysis of the described policy options:

The role of the government for ensuring a sustainable model for providing efficient, equitable and quality emergency Medical Services cannot be overemphasized. In order to address the issue of negative externality associated with Trauma effectively, the Government needs to play the minimum role of “Facilitator”. It needs to set the ground by providing “Central guidelines and regulatory standards for providing Emergency Medical Services”. In order to overcome the problems of Principal/agent and moral hazard there is an urgent need to set up an autonomous EMS Authority in the Ministry of Health & Family Welfare.

In addition, financing EMS especially in the rural area has a severe restriction of viability. Therefore, Government is required to be proactive and explore budgetary as well as non-budgetary resources to provide financial support for rural EMS and underserved urban population. Budgetary resources may be in the nature of tax revenue, Cess on Highway projects...etc. Non-budgetary resources may take the form of raising voluntary contribution, donations, making insurance compulsory for the vehicle owners...etc. Compulsory insurance takes care of the problems like adverse selection, vertical equity.

These positive interventions by government are a prerequisite for any of the described policy options to be successful. It may be further noted that the EMS is fast evolving in India. The government of India has laid a lot of emphasis on it in the on-going Eleventh Five – year Plan.

Therefore, in the background of envisaged role of the government and fast evolving EMS in India the stated four policy options are analyzed in terms of criteria like “Possibility of future development” and “Ability to raise other resources” besides other quantitative and qualitative criteria. For quantities data are obtained from the respective Heads of the organization. They are averaged where required. These options are analyzed in the light of the
existing models. Since, all but one options are urban based, quantitative comparison is restricted to urban area. However, a separate criteria for “Providing rural EMS” is also considered due to its overwhelming importance for India with majority of populace residing in rural area.

For the purpose of brevity, range of values for quantitative measures is provided in case of analysis of first option only and the same is not repeated in other options.

Option I: EMS by State Government Health Department.

This is one of the earliest EMS models, which has demonstrated sustainability and increasing utilization of the service by people.

Efficiency

The daily emergency ambulance dispatches is 150, which is medium in the range of 80 - 178. Another problem likely to arise is that all the State Government may not be able to generate the required level of awareness regarding EMS due to the problem of information asymmetry. This may lead to insufficient utilization of services by people and lesser no. of emergency dispatches than required. People may end up spending out of pocket for less efficient alternative services. This aspect is built in this criteria of “Average daily dispatch”.

The cost per ambulance per day of Rs. 2300/ is clearly an outlier without which the range narrows down to 120 – 474. Such huge operation cost is due to a very high & rigid public sector salary component. Since, this EMS is one of the earliest, there has also been a continuous rise in the pay scales. The model does not distinguish between Pilot & emergency Medicine Technician. Both the employees deployed on the ambulance are trained to function in both these capacity, raising salary structure thereby and representing the “X-inefficiency”
that can prevail in the public sector. In terms of utilization of ambulances, 5.8 trips per ambulance per day is of medium level in the range of 3-8.5.

Since, State Government Health Department provides a framework for co-ordination of EMS activities namely Pre – hospital care, safe transportation & stabilization, It is possible to converge EMS with the other Government run health services & infrastructure. However, to transform this possibility into reality is a big challenge for a government set up due to higher principal agent problems.

This option requires a complete Government involvement exposing it to all the risks of government failure especially problems of bureaucratic supply like determining the right size, X – inefficiency, inflexibility in operations, lack of dynamism to adjust to emerging & changing requirements & organizational externalities . These problems are addressed to some extent by forming an autonomous society under the chairmanship of Health Minister. There is a possibility of increasing autonomy further and making it more efficient by inducting professionals on the board, strengthening trauma wards in Government Hospitals, deploying more number of ambulance.

The overall efficiency under this option is of medium level

Equity

This option is likely to provide higher population coverage especially the poor which is the most vulnerable to trauma leading to mortality & morbidity. Social & economic loss due to such morbidity & mortality can be minimized. The level of horizontal equity in terms of equal treatment to all is higher too. However, in the total absence of vertical equity, tax payers end up financing services to the rich.

The overall level of equity is high for this model.
**Quality**

The average response time to reach the site on receiving an emergency call is 11 minutes. It is less in the range of 11 – 15. The personnel is trained. There is under deployment of ambulance in this particular case. The deployment of one ambulance covers on an average 435,000 persons. This is low deployment in the range of 192,592 – 435,000. The issue of deploying ambulances in the rural area is not applicable here as the State consists of Delhi metropolis. In other case, the State Government deploys ambulances in rural area.

The overall level of quality remains at medium level.

**Feasibility**

This model provides good possibility of raising extra budgetary resources. Autonomous society has access to private contribution as well public resources. There is a possibility to introduce vertical equity among the affording section by making accident/trauma insurance compulsory for all the vehicle owners. The remaining poor section can be covered through Budgetary support / private contribution. Therefore, there is a possibility to introduce horizontal & vertical equity in optimal manner.

Politically, the option may become less preferred. Some of the trauma & accident cases as well as natural/manmade disaster attract huge public attention and any exposed inefficiency or actual problem in fully meeting these exigencies is likely to earn bad name to the Government.

Scalability under this option to other State Government is not very high. Delhi is an urban state. Government has more resources and manageable size with lesser governance issues than other states of the Indian Union like Uttar Pradesh & Bihar. Therefore, all the states may not be able to provide EMS with similar success.
The overall feasibility is of medium level.

Remarks

This option provides a framework & possibility for reasonable efficiency, optimal equity, financial sustainability & required quality. However, this option is exposed to all the limitations of bureaucratic supply. States with financial resources and better Governance & efficient government health services like Tamil Nadu may be able to overcome shortcomings of bureaucratic supply. However, this is not likely to be true for majority of Indian states.

Option II EMS by Fire Services:

Fire services are organized in different manner in different states. In a state like Gujarat it is provided by the Municipal body. In some states there are centralized Fire services. The expertise & coverage also vary from state to state. The analysis of this model is on the basis of the EMS provided by Fire Services, Ahmedabad Municipal Corporation. The desirability of this option to achieve the stated goal may be construed in the light of the following analysis.

Efficiency

The daily average dispatches of 80 is low. The main activity in this option is “Fire services” & not EMS. The Fire Service analyzed has just one BLS ambulance and no ALS ambulance. That may restrict its efficiency. The cost per ambulance per trip - Rs. 120/ is the lowest among the described options. The average 3 trips per ambulance per day is low compared to other options. However, convergence with Fire services has its own advantages. It improves the rescue operations and may keep the impact of trauma lower. This option has
access to the entire Government Health care network. Therefore, seen in entirety, the operational efficiency is likely to be reasonable though lower than the present arrangement.

The overall efficiency is a little lower in this option compared to other options.

**Equity**

The model provides for high horizontal equity. It covers underserved population within the jurisdiction of fire service. However, there is a much lesser possibility of introducing vertical equity for affording section of the society by the local Government itself unless introduced by the State/Central government.

The overall Equity is of high level.

**Quality**

Overall quality of EMS under this option is medium. However, the average response time of 11 minutes even reduces to 7 minutes in case of expressed emergencies, which is the lowest. This is due to the well laid protocol of Fire Services. The technical expertise & quality for EMS are not likely to meet the required quality standard. The level of training and infrastructure are both low. It has only one Basic Life support ambulance and no Advance Life Support Ambulance. Very few staff has the required EMS training. The deployment of one ambulance per 192,592 persons is the best among the options.

The overall Quality is of medium level.

**Feasibility**

Availability of non-budgetary resources for funding the EMS is limited. In case of Centralized Fire service, it is not likely to have operational & financial flexibility. Even where it is with the Municipal government, municipal services may receive higher priority.
However, politically the option has medium level of acceptability as it is converged with the well established Fire Service, which doesn’t raise the profile of EMS unduly.

Scalability of this model may be cumbersome due to varying degree of expertise & organization. Even within the state, there are likely to be more than one Fire Services where it is not centralized.

EMS for rural populace may remain uncovered necessitating other alternatives.

**Remarks**

Notwithstanding fairly high standards & acceptability achieved by the Fire Services provided by Ahmedabad Municipal Corporation, there are limitations of Training & infrastructure for providing EMS. It is likely to aggravate further in case of other Fire services.

**Option III : Present model of implementation by Not – for – Profit organization**

At present, more than ten State governments have entered into Memorandum of Understanding with EMRI for providing pre hospital care. Even though, the decisions are taken by respective State authorities, there is a uniformity due to single agency. The possibility of achieving policy goal by present arrangement is as follows :

**Efficiency**

The daily average emergency dispatches of 178 are the highest among the options. However, the average cost per ambulance per trip is Rs. 474/, which even higher than the for – profit option of private hospital. 8.5 average trips per ambulance is the highest among the options, denoting better utilization of ambulances, as it is dedicated to EMS. It has access to
more than 1200 different levels of hospitals in both Government & private health care coupled with an advanced Technology and managerial expertise leading an overall high level of efficiency. At the same time, fully dedicated resources and higher level of management leads to higher operations & maintenance costs.

Though EMRI is private and not for profit nodal agency appointed by the respective State Governments, there is seemingly no competition and agency enjoys natural monopoly mainly due to technology & managerial expertise. Natural monopoly & Govt involvement expose the model to some problems as well. Price discovery for EMS becomes difficult and X-inefficiency is likely to persist as reflected in its higher operations & maintenance cost. In addition, there are principal/agent and moral hazard problems as described earlier.

However, there is a possibility to introduce competition through fair & transparent process. In the immediate future, other not – for – profit agencies may not be able to conform to the required standards. However, in due course they are likely to develop the capabilities and meet the standards. This will lead to price discovery and higher operational efficiency.

The primary focus of the agency is on “Pre hospital” care & transportation. This may result in crowding out of Stabilization / Emergency Medicine. On the whole, if the desired improvements come through then compared to other options the efficiency levels are high.

The overall efficiency is of a little higher level than other option.

**Equity**

The model covers both underserved and rural population. It results into higher social benefits. It also ensures horizontal equity. However, service to the affluent section of the society is financed out of the budgetary support. This can be rectified by the compulsory
trauma/accident insurance for vehicle owner by the government. The agency can also explore possibility of getting voluntary contributions, donations & more funds from the private sector.

The overall equity level is high.

**Quality**

The average response time of 12.52 minutes to reach the site on receiving emergency call is of medium level compared to other options. EMRI has designed a specific model of ambulance with an underlying logic to provide speedier EMS and reduce the response time. These specialized ambulances are supported by advance IT application and higher level of management. However, the average response time is still more than 1st & 2nd options. The deployment of one ambulance per 247,619 persons is of medium level. However, with higher number of trips per ambulance (8.5) it sends higher no of daily emergency dispatches.

The quality of care is high due to training and infrastructure. It facilitates capacity building and improvement in infrastructure in health care institutions as well. It provides sensitization training to volunteers & first responders and makes a lot of efforts to address the problem of information asymmetry. This is one of the reasons of the popularity of the service. Ability to take the community along is generally the strength of effective Not-for-profit agencies. This also makes them politically more acceptable.

The overall quality level is of medium level.

**Feasibility**

This option provides high possibility of raising non-budgetary resources. The organization is a private, not-for-profit autonomous societies with professionals on the board. Therefore, it is likely to invoke interest from government & private sector both. That will benefit the model from both the sources of finances.
As discussed this option has a high political feasibility as well. Scalability under this model is easier as the implementing guidelines and terms & conditions of the MoUs remain almost same. In many cases even the agency remains same.

The overall feasibility is higher than that of other options.

**Remarks**

If this option is improved as indicated, the problem of government & market failures can be addressed effectively due to healthy competition.

**Option IV : Private hospital based EMS**

M/s Apollo Hospitals has set up a chain of hospitals. It provides EMS in the vicinity of these hospitals. This option of EMS by private, not-for-profit organization operation in metropolis of Chennai is analyzed as follows:

**Efficiency**

Daily 150 average emergency dispatches is of medium level. The average cost per ambulance per trip is Rs. 325/. Average 6 trips per ambulance per day also falls in the medium range. The main focus of the organization is on secondary & tertiary Health care. EMS is one of these activities. Therefore, the overall efficiency remains of medium level. In addition in a hospital based model, pre hospital care & safe transportation may not receive equal importance as stabilization does. In case of Apollo Hospital chain in Chennai city total no of beds in trauma wards are 600 whereas total no of ambulances deployed is 25. There is likely to be over investment in infrastructure increasing the cost. However, the stabilization
care remains limited only to Apollo Hospital. The model has financial sustainability as the services are financed out of user charges and government budgetary support is not required.

The overall efficiency level is medium

**Equity**

The overall social benefit & horizontal equity under this option is not as high as in other options due to limited coverage of underserved population. The service is provided on the basis of user charges which this population cannot afford. However, it ensures vertical equity as quality of service depends upon ability to pay.

The overall Equity level is low.

**Quality**

The 15 – minutes average response time to reach the site on receiving an emergency call is more due to lack of dedicated control room to EMS and more focus on stabilization. However, the quality of medical care is high in this option due to high end equipments & well trained staff. The deployment of one ambulance per 280,000 persons is of medium level.

It provides a limited geographic coverage. It covers affording section of the population within the vicinity of the hospital.

The overall quality level is of medium level.

**Feasibility**

There is a possibility of financing underserved population through cross subsidy. There is a lesser possibility to explore resources like voluntary contribution/donation for underserved population for the profit organization. It restricts support from both government & other private sector. The financial viability of the model depends upon the fact that
subsequent to initial stabilization, the patient will remain in the hospital for the complete
treatment. However, there is a possibility of adverse selection. The patient may leave after
receiving relatively less costly stabilization care.

This option is less viable politically as the Government may be accused of favoring a
particular private hospital and exploitation of patients.

This option can be easily replicated by other hospitals. The overall feasibility is of
medium level.

Remarks

Notwithstanding the said limitations for application on a wider scale, this option has
some utility. It is likely to reduce the load of the Government sponsored EMS by serving to
the affording section of the society and more resources will be available for the underserved
population. With more number of private hospitals providing EMS, the cost is likely to come
down due to increased competition making discovery of price possible.

Summary Table of Analysis of Policy Options

Efficiency

<table>
<thead>
<tr>
<th>Impact criteria</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost : Average Cost per ambulance per trip</td>
<td>2300 – Very High</td>
<td>120 – Low</td>
<td>474 - High</td>
<td>325 - Medium</td>
</tr>
<tr>
<td>Benefit : Average Emergency dispatches per day (Reach)</td>
<td>150 - Medium</td>
<td>80 - Low</td>
<td>178 - High</td>
<td>150 - Medium</td>
</tr>
<tr>
<td>Trips per ambulance</td>
<td>5.8 - Medium</td>
<td>3 -Low</td>
<td>8.5 - High</td>
<td>6 - Medium</td>
</tr>
<tr>
<td>Operational Efficiency</td>
<td>Medium : convergence</td>
<td>Medium : Fire service is main</td>
<td>High : EMS is the only focus;</td>
<td>Medium: Secondary</td>
</tr>
</tbody>
</table>
with existing health infrastructure; principal/agent & moral hazard problems; limitations of bureaucratic supply

| Room for future improvement | Medium: increasing autonomy, & managerial expertise; strengthen Govt trauma wards; more no of vehicles | Medium: More focus on EMS; capacity building; equipping ambulances; more autonomy | High: Introduce competition & transparent process; cost reduction; collaborate for stabilization | Medium: Cost reduction; Strengthen pre hospital care |

**Equity**

<table>
<thead>
<tr>
<th>Impact criteria</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population coverage</td>
<td>High – covers entire population</td>
<td>Medium – covers urban population</td>
<td>High – Covers entire population</td>
<td>Low – Covers affording section of urban population</td>
</tr>
<tr>
<td>Social benefit / Horizontal equity</td>
<td>High – Equal treatment to all irrespective of paying capacity</td>
<td>High - Equal treatment to all irrespective of paying capacity</td>
<td>High - Equal treatment to all irrespective of paying capacity</td>
<td>Low – treatment depends upon ability to pay</td>
</tr>
<tr>
<td>Vertical equity/ Fairness to tax payers</td>
<td>Medium - Tax payers finance service to affluent section too</td>
<td>Medium - Tax payers finance service to affluent section too</td>
<td>Medium - Tax payers finance service to affluent section too</td>
<td>High – Tax payers do not finance</td>
</tr>
</tbody>
</table>

**Quality**

<table>
<thead>
<tr>
<th>Impact criteria</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Time (ambulance arriving at site)</td>
<td>Low – 11 minutes</td>
<td>Low – 11 minutes</td>
<td>Medium 12.52 minutes</td>
<td>High – 15 minutes</td>
</tr>
<tr>
<td>Quality of Pre hospital care &amp; stabilization</td>
<td>Medium: Trained personnel though limitations of infrastructure</td>
<td>Low : limited focus on EMS ; Low level of EMS training : Low level of infrastructure</td>
<td>Medium : training, technology, infrastructure &amp; managerial expertise ;</td>
<td>High : due to deployment of trained personnel &amp; high end equipments</td>
</tr>
</tbody>
</table>
Limitation due to Stabilization care

<table>
<thead>
<tr>
<th>Geographic coverage</th>
<th>Low : One ambulance per 435,000</th>
<th>High : One ambulance per 192,592</th>
<th>Medium : One ambulance per 247619</th>
<th>Medium : One ambulance per 280,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulance deployed in rural area</td>
<td>N/A – medium (for the general option)</td>
<td>Nil - Low</td>
<td>14 - High</td>
<td>Nil - Low</td>
</tr>
</tbody>
</table>

**Feasibility**

<table>
<thead>
<tr>
<th>Impact criteria</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
<th>Option IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to raise other resources</td>
<td>High: compulsory trauma insurance for vehicle owners, Highway cess; private contribution</td>
<td>Low : limited options to raise resource</td>
<td>High : Govt support; resources like donations and voluntary contributions</td>
<td>Low : limited options for additional resources on its own</td>
</tr>
<tr>
<td>Political</td>
<td>Low : Govt may be unwilling to take blame for any lapses</td>
<td>Medium: Convergence is with established Fire Service</td>
<td>High : Third party insulation available; more acceptable to community</td>
<td>Low : Govt may be criticized for favoring a corporate</td>
</tr>
<tr>
<td>Scalability</td>
<td>Low : varying degree of expertise &amp; resources of State Govt</td>
<td>Medium : Fire services are not organized uniformly; Uniform protocol</td>
<td>High : uniformity in terms &amp; conditions; technology &amp; organization</td>
<td>High : Easy to adopt for private hospitals</td>
</tr>
</tbody>
</table>

**Recommendation**

The foregoing analysis provides insight into organization & financing of the available options. Option I, II & IV have limitations in terms of overall level of efficiency. Options II has further limitations of quality. Option IV is further constrained on the ground of equity. Option I provides a good framework & possibility of achieving policy goals in case of only well governed states of manageable size. This makes it less feasible for most of the Indian
states. In addition, even for well governed states the risks related to limitations of bureaucratic supply always remain.

Therefore, the desired policy goals are best achievable in the improved version of option III. Option IV can co-exist without any Government involvement. It will cater to the affording section of the society. That will reduce the burden of the Government and spare its limited resources for the underserved section. It should not be limited to a specific not–for–profit private agency. A transparent procedure for selection of appropriate agency is a must. Healthy competition among these agencies can overcome market & Government failures effectively. The role of Government in terms of regulator, facilitator & supporter cannot be overemphasized in this regard.

Government needs to set clearly the rules of the game by providing a centralized regulatory guidelines and quality standards. This will set the ground. The problem of Principal/agent needs to be addressed by setting up a Central Regulatory & monitoring authority. The same authority may provide the Government support. The performance based monitoring will be effective in this regard. Gujarat State has taken an initiative in setting up a state wide autonomous EMS Authority. Similar Authority is required to be set up at the Central level.

The financial viability of EMS can be strengthened along with the secondary benefit of generating awareness by making accident/trauma insurance compulsory for all the vehicle owners. This will also take care of the problem of adverse selection. At the same time, it will promote horizontal equity among the affording section and budgetary fund can be effectively utilized for the underserved population.

Therefore, the group concludes that strengthened option III would work the best to achieve the stated policy goals.
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Appendix 1. Multi Criteria Analysis of Policy Options

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Evaluation</th>
<th>Weight</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Option 1</td>
<td>Option 2</td>
<td>Option 3</td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost : Average Cost per ambulance per trip</td>
<td>2300</td>
<td>120</td>
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<td>150</td>
<td>80</td>
<td>178</td>
</tr>
<tr>
<td>Trips per ambulance</td>
<td>5.8</td>
<td>3</td>
<td>8.5</td>
</tr>
<tr>
<td>Operational Efficiency</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Room for future development</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Equity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population coverage</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Social benefit / Horizontal equity</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Vertical equity/ Fairness to tax payers</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response Time (ambulance arriving at site)</td>
<td>11</td>
<td>11</td>
<td>12.5</td>
</tr>
<tr>
<td>Quality of Pre hospital care &amp; stabilization</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Geographic coverage</td>
<td>435</td>
<td>193</td>
<td>248</td>
</tr>
<tr>
<td>Ambulance deployed in rural area</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Feasibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility of Financing model</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Political</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Scalability</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>SUM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Qualitative criteria were expressed in scale of 1 (low) - 3 (high) and the scores assigned proportionally with Low receiving 0 and High - maximum score.

Scores of quantitative criteria were calculated proportionally with the best evaluation receiving maximum score.

Weights of the criteria were developed by Emergency Medical Services Expert Group.