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Case Study

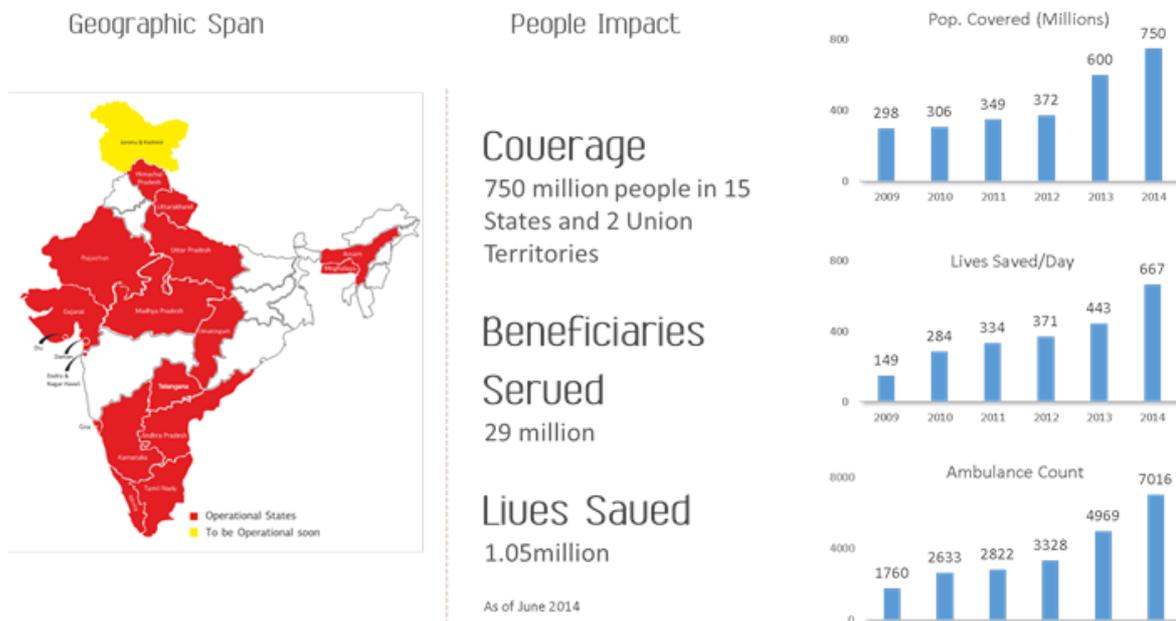
GVK Emergency Management Research Institute: Operating the 108 Emergency Care Model

“After two days, Bhavnaben was finally able to hold her baby girl in her arms, the one who seemed to be stillborn. Everybody at the hospital they called her a miracle baby, but Bhavnaben knew that the real miracle was possible due to the endless efforts of those two angels from GVK EMRI who were sent to her by God.”

- Beneficiary of the GVK Emergency Management Research Institute

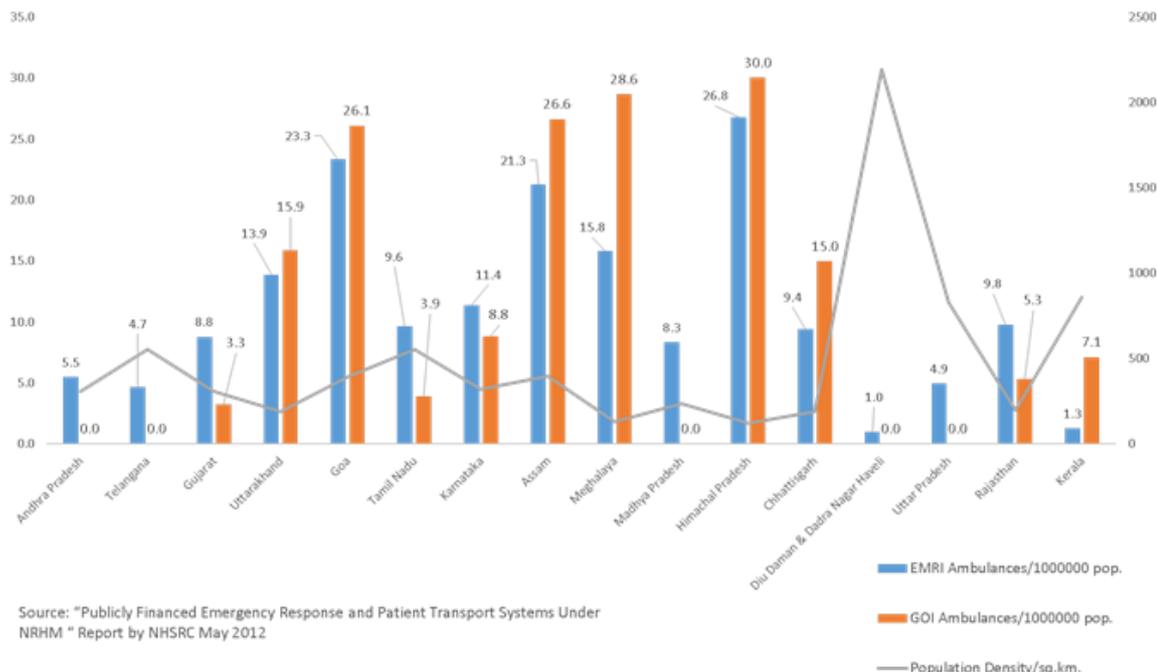
The GVK Emergency Management Research Institute (EMRI) has reached out to about thirty million emergencies saving a million lives through the 108 emergency care system. The 108 emergency care service is a unique public private partnership (PPP) model between state governments in India and several private players, the largest being the GVK Emergency Management Research Institute. The Institute was the pioneer private player in India and has transformed a virtually non-existent emergency care space into one that is comparable with the developed countries. The Institute provides coverage to 750 million people across fifteen states and two union territories in India at an annual per capita cost of less than a quarter of a dollar.

Figure 1: Reach of GVK Emergency Management Research Institute



Source: GVK EMRI Empower Vol 1 Issue 3 Apr-Jun 14

Figure 2: EMRI Ambulance Count vs. Government of India Ambulance Count



Source: "Publicly Financed Emergency Response and Patient Transport Systems Under NRHM " Report by NHSRC May 2012

The free transportation and pre-hospitalization care provided by the Emergency Management Research Institute are supported by state of the art technology and medical innovations. The positive impact of the model on the accessibility and affordability of emergency care makes it ideal for adoption in low and middle-income countries. This case study outlines the many facets of the model, including its partnership structure, operational model, and the technology and management innovations that support public health outcomes. The case study also attempts to analyze the factors that have supported the growth of the GVK Emergency Management Research Institute and what elements are required to replicate the model in other contexts.

The Idea

The Emergency Management Research Institute was established in 2005 in Andhra Pradesh. Ramalinga Raju, the founder of Satyam Computers, saw a lack of suitable emergency transportation options to support his aging parents. Private transportation or erratic public transportation without any pre-hospital care were the only options at that time. Both options were insufficient for emergency cases and were often unreliable. Raju launched a service with forty ambulances equipped with state of the art technology and the ability to offer patients pre-hospital care. The service would provide on call emergency transportation and drop-off at the closest and most suitable care facility. However, running the service as a private entity would limit the ability of the service to expand. Raju approached the government of Andhra Pradesh to form a unique public private partnership that would provide emergency transportation to the entire state of Andhra Pradesh. Today, GVK Foundation, the social responsibility wing of an Indian industrial conglomerate, supports EMRI. It is popularly called as GVK EMRI.

In 2005, the National Rural Health Mission (NRHM) was launched in India. The Mission provided flexible financing options that state governments could use to support innovations that improved service delivery. The Mission also advocated public private partnerships in health to improve health outcomes by committing budgetary and regulatory support. Using funds from the Mission, the government of Andhra Pradesh started the 108 emergency services on a public private partnership mode in the state.

Operational Model

The 108 helpline is a toll free number that users call for health, police, and fire emergencies. Calls are coordinated by a single, state level call center. In the field, approximately one ambulance is positioned for every one hundred thousand people. Each ambulance has a staff of three drivers and three paramedical emergency technicians. Two supervisors oversee every fifteen vehicles. The service is free for the user. Standards of care require pick up within twenty minutes near urban areas and

within forty minutes in rural areas. The process flow for a typical emergency response entails the four steps illustrated below.

Figure 3: Operational Model



Source: Internal Analysis based on interviews with GVK EMRI

The Emergency Management Research Institute built the largest model for emergency response services within a health system that was barely equipped to support this innovation. The need for the service was large, but the demand for it was not well articulated to attract private players in this segment. To catalyze a strong demand, the Institute engaged in several community sensitization activities. This helped improve awareness of emergency care. It also helped position 108 as the go-to number in case of emergencies. A recent study in Andhra Pradesh showed that ninety percent of the population is aware of the 108 number and emergency response service.

In the beginning, the Institute faced a number of challenges in its effort to establish a high-quality emergency response service. At the time, India was not supported by Global Positioning Systems (GPS) that would allow the Institute to pinpoint the exact location of the emergency site. Finding trained personnel was another challenge. No protocols existed to document the patient's condition en route to the hospital. Even after the Institute organized all of the inputs needed for the emergency response service and the ambulances hit the road, erratic traffic flow and road congestion posed additional hurdles that prevented ambulances from reaching patients.

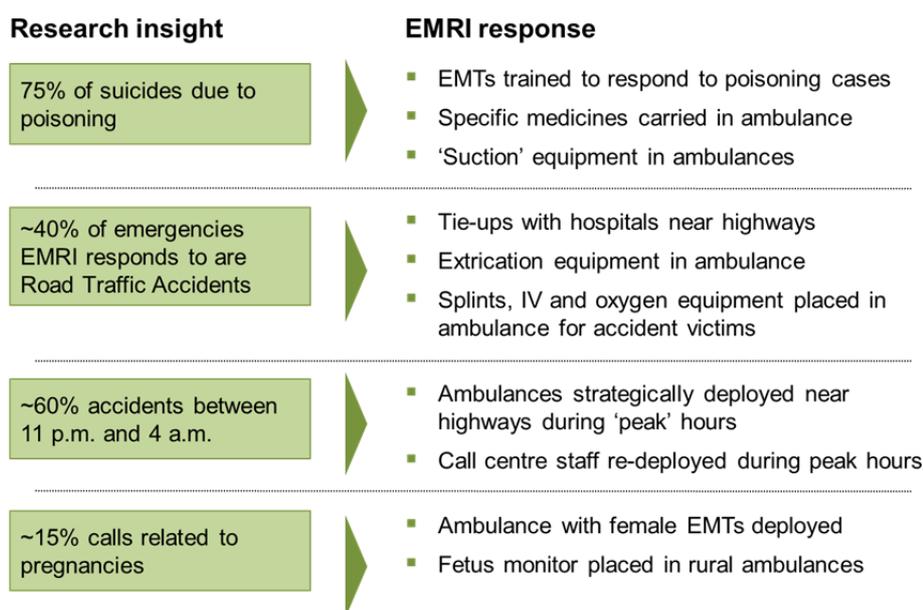
A combination of unique factors drove the model to overcome these challenges. The latest telecommunication, computing, medical, and transportation technologies are the cornerstone for the timeliness and efficacy of the service. The call centers and ambulances are now GPS enabled. The emergency line operator uses dynamic optimization algorithms to assess the nature of the emergency, the severity of the emergency, and the location of free ambulances. These tools allow the operator to dispatch the right ambulance for any given emergency.

Another distinguishing feature of the Emergency Management Research Institute is the urge to innovate and improve. The Institute has integrated emergency responses for medical, police, and fire departments. The Institute addressed human resource gap by using task shifting and standardization through training. The Institute trains high school graduates from the community to work as emergency medical technicians. Doctors guide the emergency medical technicians remotely from a centralized emergency response center.

At the core of the functioning of the Institute’s service are standardized processes and protocols. From the officer receiving calls, to the drivers manning the ambulances, every member has a clearly defined process flow with unambiguous guidelines for contingencies. This allows for efficient monitoring of the service. The Institute has designed a well-organized system for expansion to new states.

The successful superstructure of the Emergency Management Research Institute’s emergency response service rests on the foundation of focused research and training. It was a pioneer in establishing a research institute that collects data in real time and uses the data constructively. An illustration of the use of research insights is presented below.

Figure 4: Research driven activities of GVK EMRI



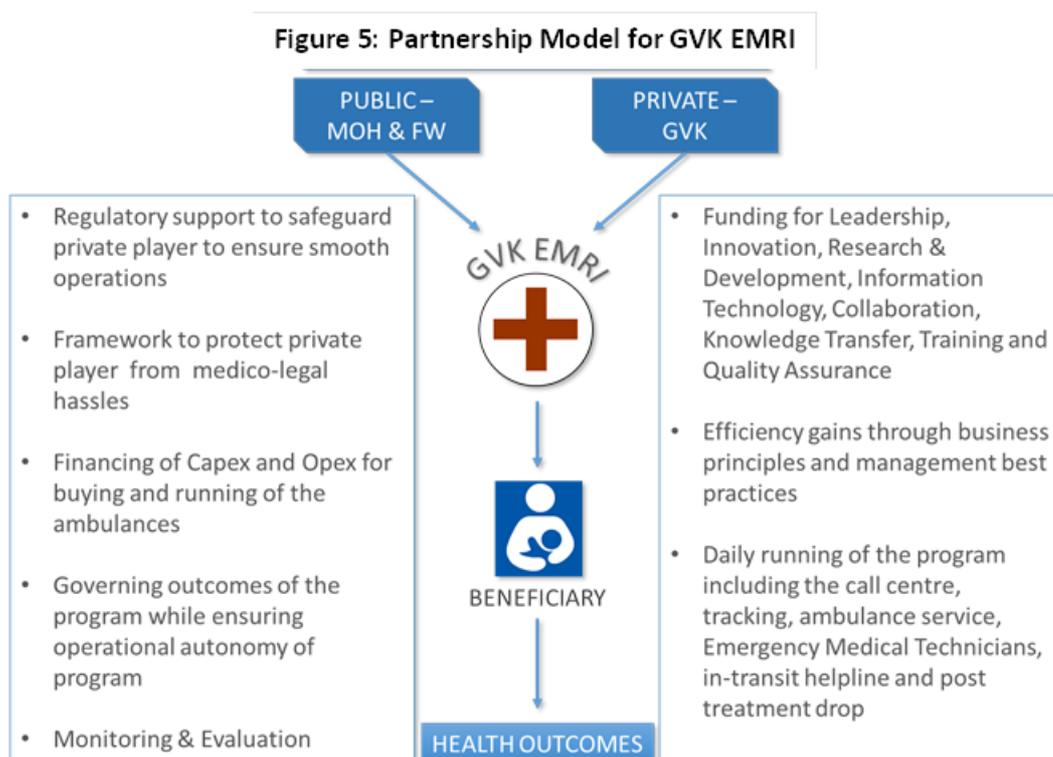
Source: EMRI Report on Forecasting RTAs; interviews

Strategic partnerships have supported the Institute right from its inception. It collaborates with premier institutions, such as Carnegie Melon University and the American Academy of Emergency in India, for training and knowledge sharing. The Institute has also developed a two year postgraduate degree in emergency care in collaboration with Stanford University. In addition to academic support, it has other important collaborations, such as a partnership for information technology with Tech Mahindra. Tech Mahindra provides free information technology solutions to the Institute.

The Partnership

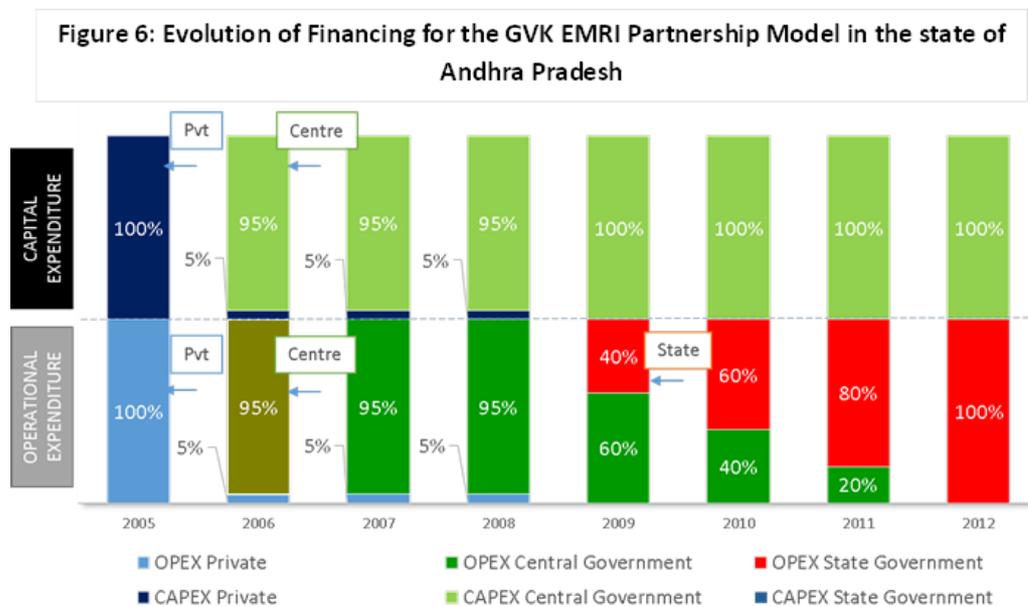
The partnership between the GVK Emergency Management Research Institute and the state governments is unique. The financial risk sharing arrangement is atypical. While the government supports the capital and operational expenses of running the ambulances, the GVK Foundation is responsible for leadership, innovation, information technology, collaborations, research, knowledge transfer, and quality assurance.

The government provides regulatory support that is critical to ensuring consistent operations. This support also protects the private provider, the Institute, from legal exposure. The government plays an important role in governing the outcomes of the service without hindering the operational autonomy of the service. Through its contributions to the management and design of the service, the Institute, as the private provider, helps to improve the efficiency of the public money spent on emergency response management.



Contracting and Reimbursement Mechanisms

The 108 public private partnership functions essentially as an “operate and maintain” service contract between the GVK Emergency Management Research Institute and the respective state governments. The states that contract with the Institute are directly involved as the purchaser of services in this partnership. Initially, the central government, through the National Rural Health Mission, provided the capital and operational budget for the 108 service to the state governments. Gradually, the onus of funding operational expenses moved from the central government to the state governments as illustrated in figure 6. Reimbursements by the states matched the bills raised by the Institute. In 2008, when the Institute was expanding rapidly into different states, the government commissioned a study by National Health Systems Resource Centre to review the costs and outcomes of the service. The study confirmed the high quality of the infrastructure, technology and professional management within the model, but suggested the adoption of a sounder financial policy. Based on the findings of a detailed costing exercise, the service adopted a cost per trip model for reimbursement.



The nature of the contracts between the GVK Emergency Management Research Institute and the state governments differs across states. Today, of the seventeen contracts, a majority are management contracts awarded based on technical and financial bid criteria. Some contracts are short term and governed by strict input and output based criteria. Short terms contracts limit the ability of the Institute to make substantial investments into building strong community engagement and work toward addressing larger health outcomes. Re-tendering after the short-term period is expensive for the government, neither viable for the existing provider nor for the new private provider. The ambulances would have been used but not depreciated enough to invest in new ambulances, increasing maintenance costs for the incoming

private provider. Short-term contracts also raise staffing issues often disrupting a smooth transition.

A few states have taken a more strategic approach. These states have signed memoranda of understanding with the Institute to work together over a longer time frame. This approach helps build trust, ensures flexibility for better outcomes, and creates a more collaborative environment for problem solving. Partnership through memoranda of understanding provides an opportunity to foster a long-term partnership and the flexibility to revise or terminate the understanding based on evaluations of performance. The government and the Institute decide jointly on input, output, and outcomes based indicators to measure performance.

The challenge that cuts across most partnerships between the states and GVK Emergency Management Research Institute is the management and governance of the partnerships. With limited capacities of the state governments to understand and abide contractual obligations, the system faces delays in payments and slow processes of grievance redressal. However, the public private partnership context in India is gradually evolving making it better for the 108 emergency care model. It is important to acknowledge the key value drivers that spurred the growth of the model.

Figure 7: Value Drivers for the Partnership



Source: Internal Analysis

Expansion

Rapid expansion of the emergency response service to other states has been driven by political interest and evidence of its cost effectiveness. The keys to the successful scaling of the service are the streamlined processes introduced by the Emergency Management Research Institute. The Institute created a core package that can be deployed in the same way in every state but has sufficient flexibility to accommodate modification to individual state contexts. The case of Chhattisgarh is an example of such a modification. The public health system in the state was not well equipped to provide care for the increased influx of emergency cases brought into public hospitals by the emergency service. The government of Chhattisgarh and the Emergency Management Research Institute agreed jointly to train and deploy two hundred emergency medical technicians (EMT) in the public health facilities to ensure continuum of care. These technicians are hospital-based technicians. They are managed and supervised by the Institute and contribute to the strengthening of the public health system in Chhattisgarh. Another example of contextualization is the introduction of boat ambulances in Assam, a flood prone state.

Impact of the Emergency Management Research Institute

On Access

For a large part of India, access to affordable healthcare services is a challenge. An estimated twenty five percent of the people in Madhya Pradesh and Orissa and about eleven percent of the population in Uttar Pradesh could not access medical care, citing location as the reason for their inability to access care (National Commission on Macroeconomics and Health, 2005). Access to care is worse for vulnerable groups, including women, children, the elderly, and low-income populations from remote rural and tribal areas. The technology driven 108 partnership addresses the issue of equitable access to emergency services by providing free emergency care to all people in India, rich and poor, rural and urban alike.

On Health Outcomes

In 2006, when the Emergency Management Research Institute was just beginning to grow, India contributed about twenty three percent to the global burden of maternal deaths. Institutional deliveries were as low as 40.7 percent (NHFS-3, 2005-06). Low numbers of institutional deliveries contributed to a high maternal mortality rate. Demand side financing programs to promote institutional delivery, such as Janani Suraksha Yojana¹ and Janani Shishu Suraksha Yojana,² had only limited impact due

¹ A demand side financing program that incentivizes mothers to seek institutional delivery.

² A demand side financing program that incentivizes mothers to seek institutional care for themselves and their infants.

to the lack of transportation to healthcare facilities. Reducing maternal deaths was a big priority for the government of India in its effort to meet the Millennium Development Goals. The Emergency Management Research Institute was well poised to help the government reduce maternal deaths.

Three kinds of delay - delay in deciding to seek care, delay in reaching a care facility, and delay in getting adequate treatment are the key barriers need to be addressed in order bring reduction in maternal mortality (NIHFW, 2000). These delays particularly affect tribal, rural, and poor women. The Institute swiftly addresses the second concern of reaching care. Pre-hospital care provided by trained female paramedics and the availability of fetal monitors in rural ambulances improves the chances of survival for women and their infants. About a quarter of all the cases handled by the Institute are pregnancy related.

In 2009, about eighty five percent of all the pregnancy related cases served by the Institute's emergency response service were from women from the scheduled caste, scheduled tribes, and backward castes. Women from these groups contribute to the bulk of maternal mortality in India. The universal reach and specific focus on pregnancy related emergencies are estimated to have contributed to a fifteen percent reduction in the maternal mortality rate in Andhra Pradesh (Jena, Bharadwaj, & Rao, 2009). Without the risk of oversimplification, we can assume that the contribution of the emergency response service to reduced maternal mortality across the country is also significant. Similarly, the Institute is likely improving the survival rates of traffic accidents. The emergency response service reaches more than twenty percent of all emergencies due to road traffic accidents.

On Household Finances

The GVK Emergency Management Research Institute has also contributed to a reduction in out of pocket household expenditure on transport to the hospital by thirty seven percent in Andhra Pradesh (Bergkvist, Wagstaff, Katyal, Singh, Samarth, & Rao, 2014).

On Public Finances

It is important to gauge the partnership through the impact it has on public finances and the output it can generate for every dollar of public money spent. The illustrations below compare the Emergency Management Research Institute service and the United States 911 emergency service on several outcome parameters and the costs incurred to achieve these outcomes.

Figure 8: Service Parameter Comparison between US 911 and GVK

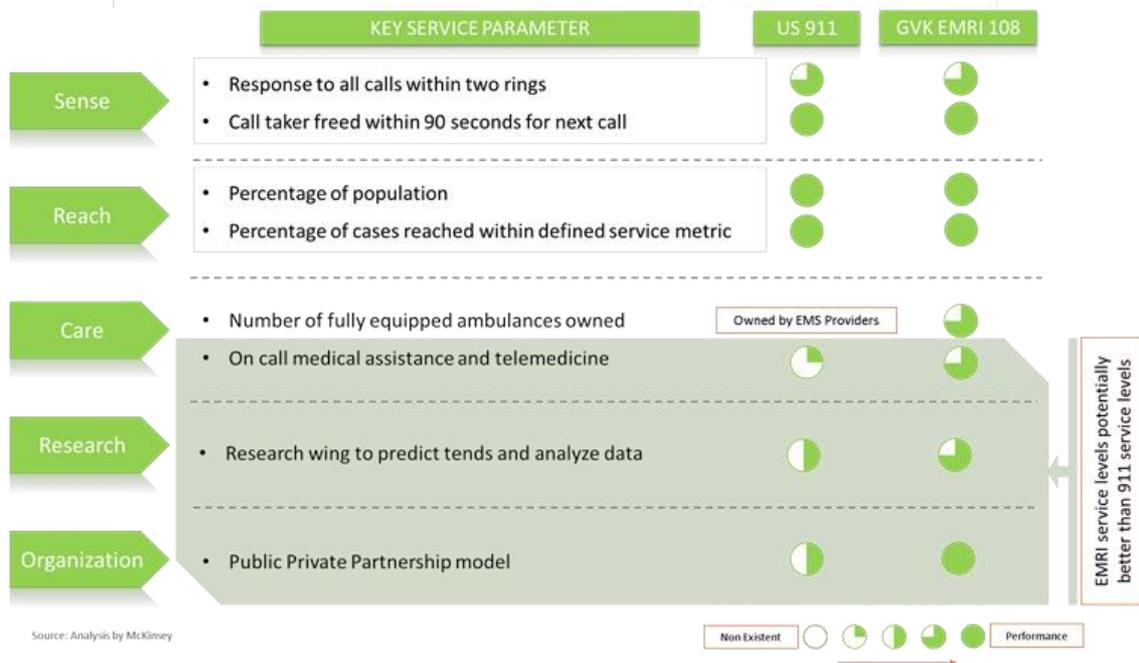
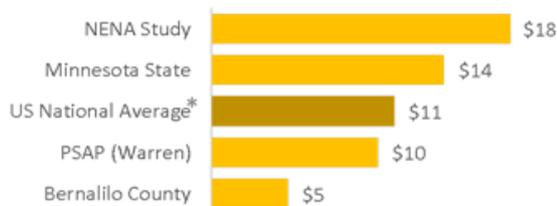


Figure 9: US\$ Per Capita "Sense" Cost Comparison between US 911 and GVK



Per Capita US\$ Cost Range of US 911



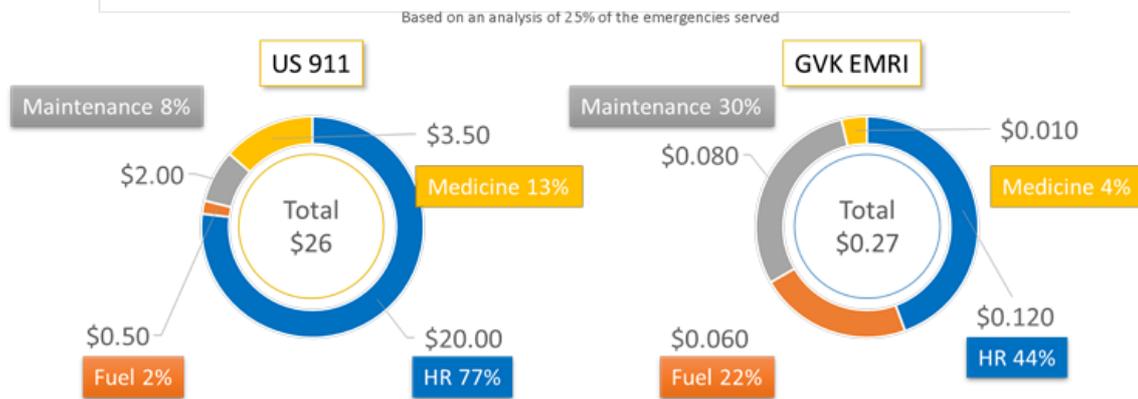
*National cost of 911 estimated at \$ 3.5billion

Source: EMRI; Expert Interviews, Warren County Budget document, team Analysis

Cost difference between US 911 and GVK EMRI is mainly due to:

- Higher HR costs
- Higher infrastructure costs due to a Decentralized System

Figure 10: US\$ Per Capita “Reach” Cost Comparison between US 911 and GVK



- “Typical costs per trip range from \$200-\$230 in the US if you consider only ambulance, HR, maintenance and medicine” – Jerry Overton, Coalition of Advanced Emergency Systems
- Average Hourly Cost for Emergency Transport = \$125 (North Eastern EMS report on ambulance benchmarking)

*Excludes infrastructure depreciation, depreciation on all communication equipment, support HR, radio equipment costs, local taxes

Cost containment has been possible through useful insights from research conducted by the Institute. The Institute has identified emergency hot spots and has placed ambulances nearby, thereby saving fuel costs. Task shifting has also helped contain costs and address the shortage of human resources.

Replication Potential of the 108 Service

The lack of emergency response service is a challenge in many low and middle income countries. The partnership between state governments and the GVK Emergency Management Research Institute has addressed pressing issues of the public health system while creating significant value for the private player. Although the service is a nonprofit venture, the Emergency Management Research Institute provides brand recognition. The Institute, as a private player, also provides a competitive advantage that enables the creation and management of sophisticated systems. This advantage can be used by for profit ventures as well.

The scorecard below offers an objective analysis of the characteristics that have contributed to the growth of the GVK Emergency Management Research Institute. The scorecard may be a useful reference for potential replicators. Replicators can apply a similar scoring system in their respective contexts to see what features of the Institute model can be adopted directly and what elements require new thinking.

Figure 11: Keys to Advantage

Key to Advantage	Criticality	Implementation of GVK EMRI Partnership
Stimulating complementary public and private investment	Public funding enables free and universal access to all citizens. Private support through value additions amplifies the impact of the public investments	GVK EMRI model is supported through National Rural Health Mission and state budgetary support for public financing. Tech Mahindra provides free IT services, GVK foundation invests in leadership and other strategic partnerships
Supportive environment for public private partnership	Policies and appropriate governing mechanisms to ensure the smooth running of large scale partnerships is important. It has implications on the effectiveness and efficiency of the schemes outputs	The lacunae within emergency transportation systems in India and the recognition by the government on the criticality of plugging this gap favoured GVK EMRI. While the regulatory environment is nascent in India, the thrust for emergency care provided an advantage.
Technology driven operations	With minimal manual intervention, the system is almost tamper and fool proof and thus able to provide truly equitable access to all the citizens in the state of operations	Technological innovation is provided pro-bono by Tech Mahindra, that continuously improves the technology backbone.
Streamlined processes	Essential to achieve the scale up through well defined roles and operating protocols that can be rolled out in other states. Essential for proper governance while supporting large scale up plans	GVK EMRI has standardized processes for the operations of the model, human resource activities, training and monitoring and evaluation. The replication models for scale up into states is also pre-determined and staff is trained to deploy the mechanisms
Cost containment mechanisms	Controlling cost is essential for scale of the model in resource constrained settings	Through research and metrics backed decisions ensure optimal use of deployable resources, help improve efficiency of services provided. Task shifting within employees through rigorous training parameters reduced costs
Enabling flexibility and evolution along with requirements of particular contexts	Flexibility to adapt to important contextual features of the state enables acceptability of the model	The core model of GVK EMRI remains unchanged, yet leaving flexibility to dialogue with states and other stakeholders to add what maybe suitable in particular state contexts. These additions are weighed for their suitability in all contexts if relevant, or remain specific add ons.

Source: Internal Analysis

Conclusion

The GVK Emergency Management Research Institute makes a strong case for addressing the gaps in emergency transportation and pre-hospitalization care. The Institute also offers an important model for the expansion of innovative practices by the private sector through public private partnership. The service is an example of how latent demand can be tapped with an initial push from the private sector. The service is also an example of how a partnership between the government and the private sector can successfully address a critical healthcare gap in a low or middle income country. The concept behind the Institute, the implementation of the concept, and its ongoing management all hold important lessons for other states and countries interested in developing a public private partnership to provide needed emergency response services.

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