2011

Evaluation
of
Haryana Emergency Ambulance Services

**School of Public Health
Post Graduate Institute of
Medical Education & Research,
Chandigarh**

**In Partnership
with**

**National Health System Resource
Centre
New Delhi**

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Project report

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1. Acronyms

ANC	Ante-natal Check up
ANM	Auxillary Nurse Midwife
APL	Above Poverty Line
ASHA	Accredited Social Health Activist
AWW	Anganwadi Worker
BP	Blood Pressure
BPL	Below Poverty Line
CATS	Centralised Accident & Trauma Services
CHC	Community Health Centre
CHWs	Community Health Worker's
DFO	District Field Officer
DH	District Hospital
EMRI	Emergency Management and Referral Institute
EMS	Emergency Medical System
FGDs	Focussed Group Discussion
GDP	Gross Domestic Product
GOI	Government of India
HDI	Human Development Index
HSVS	*Haryana Swasthya Vaahan Sewa*
IEC	Information Education Communication
IMR	Infant Mortality Rate
JSY	Janani Suraksha Yojana
INR	Indian National Rupees
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
MoU	Memorandum of Understanding
NSSK	*Navjaat Shishu Suraksha Karyakram*
ORCON	Operations Research Consultancy Network
PHC	Primary Health Centre
RCH	Reproductive and Child Health
RTO	Referral Transport Officer
SP	Service Provider
UNICEF	United Nation's Children Fund

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2. Acknowledgement

Emergency ambulance services in Haryana are provided as a state level scheme operational in all the 21 districts. At the ground level, Health Department and Red - Cross society work together to deliver the timely health care. Current evaluation was undertaken to establish the extent to which the emergency services are being provided efficiently and effectively in the state with focus on equitable distribution of resources.

This report strives to understand how the transport services have acted as a vehicle for change in the lives in community by improving access to health care services. Evaluation was conducted using mixed methods approach where quantitative as well as qualitative techniques were used to ascertain extent and pattern of utilization of ambulance services, unit health system costs of operating the referral services by the Haryana Government and the minimum efficient scale of operation. In-depth review of structural organisation and operational framework of the referral system of Haryana was done. Focussed group discussions were held with service providers, health workers and community members, to assess the strengths and weaknesses of the scheme.

Extent and pattern of Utilisation:

- Majority users belonged to age group of 15-59 years (93-95%), were women (88.3%, $p<0.001$) and residents belonging to rural areas (86.2%, $p=0.01$). No significant difference was found in users' profiles in the three districts.
- This service was used predominantly by the poor among those who utilised services (Concentration index value= - 0.05), an indication that the HSVS service was making health care utilization more equitable from income perspective ($p = 0.016$).

- Majority users were pregnant women who used the service for normal delivery (70%) and obstetric emergency (12.6%).

- Patients using the HSVS service were generally less complicated than those reaching the health facility by their own means.

- Nearly 50% of those who reached the hospital using private means, reported lack of awareness about the HSVS scheme.

- The services were being used mostly between the time from 8:00 Hrs – 14:00 Hrs (45%).

- Among three levels of public health facilities in the state, district hospitals in all the three districts under study were found to have received maximum number of HSVS users (25-40%).

- Mean distance travelled by ambulances per call in the state is 35.04 Km ±79.3.

- While more than 80% users of HSVS reached the hospital within 1 hour of the call, about 38% could reach the hospital within 30 minutes of the call.

Cost evaluation

- It was found that the ambulance services costs the Government on average Rs 15.5 per km travelled.

- Under optimal scenario, we found that the most efficient level for operating an ambulance was with a patient load of 137 per month and a mileage of 51451 km per month which will result in a cost of Rs. 9.57 per Km.

- Most ambulances in Haryana were operating on an inefficient scale. Even in the same district costs per km were highly variable, some ambulances faring better than the others.

Social Audit: The knowledge level of the respondents in all 3 categories was assessed at three levels: awareness about the referral services; users of the schemes and source of information about the ambulance service.

- The service providers and users in all the three districts were aware of the different tenets of ambulance service.

- Users of service reported ambulance service is well accessible. However, they reported that the ambulance is not accompanied by any doctor or paramedical staff which at times has resulted in a stressful experience for them.

- The service providers reported a shortage of the paramedical staff, lack of capacity of the drivers and inadequate funds as challenges for providing the ambulance service.

- The inadequate funds, recruitment and capacity building of the staff require more attention, as suggested by the service providers selected in the study.

- It was felt by the service providers that there is an increase in the number of institutional deliveries. They also reported an increase in their work load as people from farther geographic regions could also access their institutions now by availing the ambulance service.

Conclusions and recommendations:

Referral transport services in Haryana are well targeted with much benefits being accrued by poor house- holds, rural dwellers and women. Overall, users and community workers are satisfied with the services of the 102 ambulance with the only apprehension that it could reach them on time. However, the quality of emergency referral transport services needs improvement.

Specific areas that require attention include supervision, establishment of response time guidelines; and ensuring that basic equipment, supplies, and trained paramedical personnel are available in order to provide on scene care and handle complications during the transportation. Till the time trained paramedical workers are not available, the service can be linked with the availability of doctor consultation through call centre. Costs reductions can be achieved by increasing service utilization. It is suggested that ambulances should be placed in locations where there is considerable demand. But this needs thought and planning as the downside may be lowered quality of services by reduction in accessibility to services. There is a need to increase spending on IEC for wealthier income groups to increase awareness about the service which is finally likely to yield increase in utilization rates. In addition Haryana government may consider making services free for entire population to generate further demand.

4. Introduction

Access to health care services becomes an issue once illness is recognized and treatment seeking is initiated. Among five dimensions of access that influence the course of the health-seeking process, accessibility to health care is a major health and development issue[1]. National level surveys in India, as well as regional studies point towards big disparities in India in terms of accessibility. According to DLHS 3, 71% of the villages in India had PHCs with in a 10 Km distance but only 55.2% had referral services for complicated pregnancy/ delivery[2]. This issue becomes more important in wake of declaration of 5th Millennium Development Goal that aims to reduce maternal mortality ratio by half from 1990 to 2015. With MMR of 212 in 2010, India does not appear to be on track to achieve the goal[3]. Three quarters of all maternal deaths in India occur from complications either during delivery or in the immediate post-partum period which include hemorrhage (38 percent of maternal deaths); infections (11 percent); unsafe abortion (8 percent); eclampsia or related hypertensive disorders (5 percent); and obstructed labour (5 percent)[4]. Nearly 75[5]-80[4] % of total maternal deaths can be prevented through appropriate medical attention at time of delivery. 27% of babies still continue to be delivered at home in India.[6] Maternal mortality is highest in rural areas where access to emergency obstetric care is limited by large geographic distances to health facilities and scarce resources[7]. A study exploring factors responsible for high maternal mortality in India revealed that most 'death cases' belonged to high-risk, socially disadvantaged groups, who either had not gone to hospital or had gone too late[8]. Delay in care was also because of lack of transport facilities, inappropriate referrals or poor emergency preparedness of referral facilities.

In order to ameliorate "delay in transportation" related deaths, especially maternal and child deaths, Government of India and different State Governments have introduced several

innovations to improve transport access in emergency situations. Different models of delivery and management of transport related services are being tried in India to address the 'access gap' for health care provision.

5. Review of Literature

Under the NRHM (2005-2012), the Government of India (GOI) aims to reduce maternal mortality by focusing on the following major strategies[9]:

1. Enhance availability of facilities for institutional deliveries and emergency obstetric care.

2. Improve access of poor women to institutional deliveries (Janani Suraksha Yojana) and other demand-side financing innovations and emergency obstetric care

3. Increase access to care seeking through strengthening referral transport.

Among the latter category, i.e. increasing access to care through strengthened referral transport; nearly 20 innovations have been experimented in India[10]. Almost all are a combination of a call centre and ambulance service. From the review of the limited material available, it is apparent that the ambulance schemes have varying operational norms and standards. Some are operational at community level, some at district level and others at state level. A toolkit prepared by United Nations Children's Fund (UNICEF) 'Operating Peri-natal Referral Transport Services in Rural India' detailed a desk-review[11] of the some of the models operational In India. (Table 1 and 2)

Table 1: Different types of models of referral transport in India

Models	Community-based models	District-based models	State- based models
Service management	Block level management (often in areas with difficult terrain and remote locations)	District Health Society	State level management. Managed by the health department/ a professional RT agency.
Operationalisation	• Coordinated by a local civil society organization • Often use locally available vehicles for transporting women. • The interface with the communities is strong.	• The centralised call centre is at the district headquarters. • A mix of existing government ambulances and private vehicles for transport. • The interface with health systems is strong for this group of models.	• The call centre is located at the state level. • The ambulances are always used for transporting women. • These models have a larger scale and operate on higher degree of interface with health system
Examples of different models	Khunti Model, Jharkhand Deepak foundation model, Surat, Gujarat	The Guna model	EMRI in Assam and the "1298" services in Kerala

Adapted from 'Operating Peri-natal Referral Transport Services in Rural India'- Toolkit

Madhya Pradesh Government launched the *Janani Express Yojana in* 2006, in which an ambulance service was started to enable BPL women to overcome the problems from lack of access to suitable transport through district-level partnerships with private providers. The scheme was implemented in 204 blocks where about 54, 202 women were transported, of which half

were for institutional delivery. In an evaluation conducted by UNFPA in 2007 it was documented that out of the total women who utilized the service, over 52% were from BPL category. Among the multiparous women who benefitted from the service, 68% had not previously delivered in institutions.

Another innovation experimented in Madhya Pradesh included a Call Centre with Network of ambulances for obstetric, gynecologic and newborn care. This was started as a 24/7 emergency transport and call centre in an effort to enable women and sick children to reach health care facilities for institutional deliveries. Round-the-clock emergency transport was provided, which the community accessed through a call centre set up in the district hospital with a toll-free number. A network of 24 vehicles at district level transported 5,026 women. Free bus passes were issued in Andhra Pradesh, to SC/ST and BPL pregnant women in rural areas to enable them to get at least one ANC check-up with a qualified medical doctor. Overall 800,000 free bus passes were issued[10].

An Ambulance Scheme was started in West Bengal in which round-the-clock emergency transport for obstetric and other medical emergencies, through a fleet of ambulances outsourced to NGOs with a communication network through fixed and mobile phones was provided. Since the inception of this scheme, caseloads were found to increase, given the widespread community awareness on the scheme. All ambulances were equipped with mobile phones. One-third of all cases that benefitted were pregnancy and delivery-related. Proportion of BPL cases transported (in three blocks) ranged from 35% to 57%.

The scheme had the provision for District Maternal and Child Health emergency control rooms in each district headquarter, with a toll-free telephone available for 24 hours. A total of 732 ambulances were operational, with an average eight trips a day. Average reach time of the ambulance was 14 minutes in urban areas and 21 minutes in rural areas. The Government engaged in MoU with 4,000 hospitals and nursing homes in different parts of Andhra Pradesh and 1,500 police stations linkages. Overall the scheme covered 147 million population and around 5,700 emergencies were transported. Ambulance use by SC/ST/BC socioeconomic categories was 83%; and was used by pregnant women for delivery in 22% instances.

An Emergency Management and Referral Institute (EMRI) was set-up to manage the referral transport in Assam. An EMRI with a toll-free number was set up in Guwahati that managed emergency ambulance services in partnership with a non-profit organisation. The ambulances were placed strategically in the districts and functioned 24x7 to cater to any kind of emergency with three teams: Information team (call taking, call processing and call dispatch), Response team (ambulance) and Care team (pre-hospital medical care). A statewide toll-free emergency number was instated to connect informants to the Emergency Response Centre in Guwahati. The service was launched statewide in November 2008 in a phased manner.

The ultimate goal of an emergency medical service (EMS) is to save patient lives and thus reduce mortality, disability, and suffering in persons. The present evaluation of the referral transport in Haryana state is not the first one. A review of past evaluation of the scheme by Financial Management Group (FMG)[12], NRHM highlighted some information gaps that this study tried to address. The previous report addressed operationalization issues of the scheme and described cost incurred by the government from the financial perspective only, which was

basically the same thing as expenditures. It was primarily an observation based study using mainly secondary data sources. Therefore, overall the report addressed the provider's perspective only.

An important point that distinct the present study from the previous ones, is that it has tried to address the economic costing of the ambulance scheme, where a cost is assigned to a good or service, in terms of opportunity costs. An opportunity cost is the value of the most productive alternative use of the same resources. This perspective is broader than the financial cost framework, and it was adopted because it includes all resources consumed in production of a service, regardless of who pays for them. In addition an attempt has been made to gauge the perspectives of service providers, community workers and community on the operationalization of scheme using qualitative techniques. This will prove useful to validate the findings from quantitative methods and also will help in framing the recommendations.

Table 2: Comparison of HSVS ambulance service with 5 models operational in India

Parameter	Guna Model, Madhya Pradesh	Khunti model, Jharkhand	Deepak foundation, Gujarat	Mritunjoy 108, Assam	1298 Kerala	HSVS 102, Haryana
Scale of Operation	District level	Multi blocks	Multi-Blocks	State	Multi districts	State
Charges a user fee	No	Yes	Yes	No	Yes	Yes from selected patients
Subsidised by government through NRHM funds	Yes	No	Yes	Yes	No	Yes
Supported by donor agency	Yes	Yes	No	No	No	Yes
ALS / BLS ambulances or vehicles only	Vehicles only	Vehicles only	BLS	ALS	ALS and BLS	BLS and vehicles

Adapted from 'Operating Peri-natal Referral Transport Services in Rural India'- Toolkit

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A comparative assessment of all ambulance schemes, to draw lessons related to standard operating procedures, monitoring of the scheme and efforts to ensure reach and equity, supported large-scale scaling up of the ambulance services in Haryana. Over and above the additional management and contractual challenges that ambulance schemes pose to the District Health Societies, key cross-cutting issues across the states included ensuring that communities of all sections become aware of the facility, enabling the really poor and marginalised to access the ambulance facility, and finally ensuring the state of preparedness of the health facility to which women are transported, to assure them of safe and high quality delivery services. To further identify and bring forth the successes and failures of the services, present evaluation study was planned and conducted, the results of which are presented and discussed in the present document.

The "Haryana Swasthya Vaahan Sewa No.102" (HSVS) is state wide public sector administered emergency referral transport service in Haryana (India) providing coverage to all the 21 districts of state. Free transportation Services are provided to pregnant women, victims of road side accident, patients belonging to below poverty line 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- serviceman. For rest of patients, a cost of Rs.7/- per km is charged for provision of services.

Services provided under this scheme include:

- Transportation from the site of accident or home or any other place to nearest appropriate Public Health Facility in case of medical need.

- Transportation from a Medical Facility to a higher Medical Facility.

Objectives of the scheme

- To reduce the Maternal Mortality rate and Infant Mortality Rate in the State of Haryana by ensuring that pregnant women reach the Healthcare Institutions in time.

- To reduce mortality rate following accidents.

- To eventually make available the Referral Transport service for regular checkups of pregnant women, thereby substantially reducing emergency.

- To eventually deploy the Referral Transport Vehicles for the post-natal care and immunization of the child, thereby reducing the infant mortality rate.

- To provide Referral transport facility in other medical emergencies.

Figure 1: Number of Ambulances in different districts of the Haryana state[*]

Salient features of the scheme:

- Services are being provided 24× 7 to the community and two drivers per ambulances have been appointed to facilitate round the clock functionality.

- Scheme is monitored by daily reporting to state head quarter. Computerised data entry using Epi info based software is an asset for the monitoring system in place.

- Patient is transported to nearest appropriate public health facilities only.

- All the ambulances being used are GPS system enabled and are mobilized/ monitored by operators stationed at the control rooms of respective district hospital.

- A fleet of 340 ambulances under the scheme are owned by the state thus making it to 1.32 ambulances per lac population.

- Another innovation is use of the 102 toll free number for reporting maternal and child deaths.

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[*]Source: NRHM report

Table 3: Infrastructure and resources of HSVS No. 102 in three districts under study and Haryana

	Ambala	Hisar	Narnaul	Haryana
Ambulances	23	22	16	335
Ambulances per lac population	2.02	1.26	1.7	1.32
No. of calls per day per ambulance	3.0	2.2	2.9	2.2
Manpower	1 fleet manager 4 call centre operators 46 drivers	1 fleet manager 4 Call centre operators 45 drivers	1 fleet manager 4 Call centre operators 28 drivers	
Budgetary provision				
Call centres	653400	649800	628200	13596600
Ambulances	10751251	13457257	9170246	181096857
IEC/ Marketing	1,50,000	1,50,000	1,50,000	1,50,000
Total Budget	11554651	14257057	8392046	198643457
Health institutes	DH=1 PHC= 16 CHC=2 SC=100	DH=1 PHC= 34 CHC=8 SC=200	DH=1 PHC= 21 CHC=8 SC=103	DH= 21 PHC= 89 CHC=425 SC=2465
Placement of ambulances	PHC= 8 CHC=4 DH=8 SC=2 Public place=1	PHC= 9 CHC=10 DH=3 SC=0 Public place=0	PHC= 10 CHC=2 DH=2 SC=0 Public place=0	

Figure 2: Call rate per lac population by Districts in Haryana State, April- July, 2011

Call rate per lac population in Haryana State

District	Call rate per lac population
GURGAON	2.0
FARIDABAD	2.1
SONIPAT	2.4
PANIPAT	3.0
YAMUNANAGAR	3.4
FATEHABAD	3.6
KAITHAL	3.8
PALWAL	3.8
KARNAL	3.9
ROHTAK	3.9
JHAJJAR	3.9
JIND	4.0
SIRSA	4.1
MEWAT	4.1
KURUKSHETRA	4.4
REWARI	4.4
BHIWANI	4.5
HARYANA STATE	4.5
HISAR	4.7
NARNAUL	4.8
PANCHKULA	5.2
AMBALA	6.8
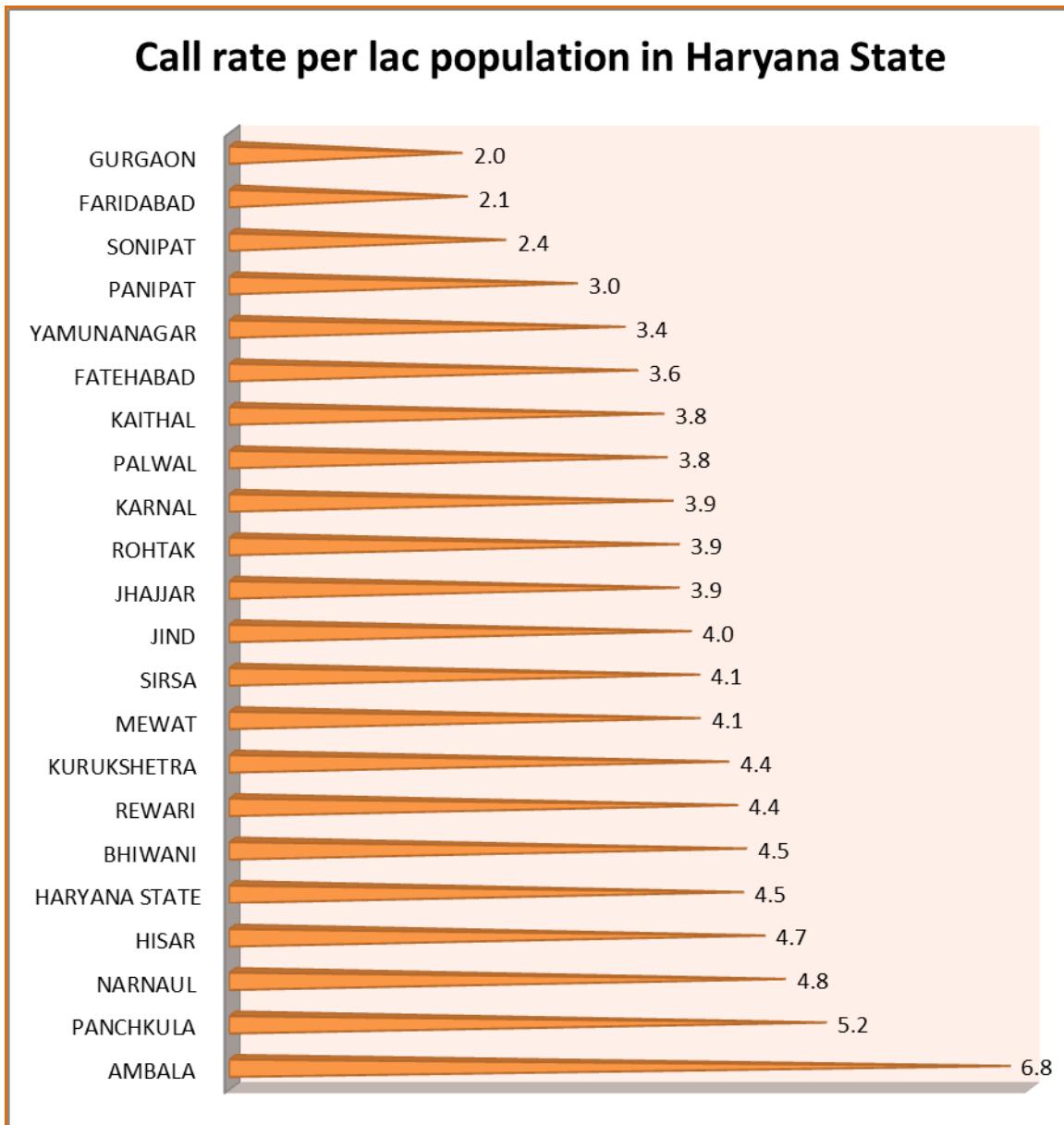
7. Objectives of the Evaluation

During conduction of this study, following broad objectives, to be fulfilled, were decided and focussed upon:

1. To ascertain the extent and pattern of utilization of the Government operated emergency transport services in the state.

2. To assess the effect of HSVS on equitable utilization of public sector health facilities.

3. To ascertain unit health system costs of operating the ambulance services by the Haryana Government.

4. To determine the minimum efficient scale of operation.

5. To identify the gaps in service delivery and provide practical recommendations for strengthening of the referral system.

8. Methodology

A mixed method approach was used while conducting the study, wherein a combination of quantitative and qualitative methodologies were used to achieve the desired objectives.

Table 4: Data sources and different issues addressed in the present evaluation

Data Sources	Data collected	Variables/ end points	Issues addressed
Secondary	1. Epi info/ Excel formats of referral transport services		Monitoring issues
	a. User's profile	Age, sex, region, mode of payment	Pattern of utilization
	b. Calls	Time of call Average number of calls Calls per district per lakh population, Reason for call	Availability Accessibility
	c. Transportation of patient	Time lags, response time Average Km's travelled from different perspectives	Quality
Primary	Interview schedules (Users/ Non users)	Profiles of users and non-users and comparison of patterns of utilisation. Geographic access (Distance from DH's, Facility wise usage) Economic access Information access Satisfaction levels Discharge status	Equity issues

Accessibility Acceptability Affordability Availability Adequacy Effectiveness |
	Costing tool for provider's perspective Monthly expenditure proforma	Per patient cost Per Km cost Efficient level of service delivery	Efficiency
	Observation of facilities using check list	Percentage of different parameters being observed	Quality of services
	Qualitative data using focussed group discussions	Issues or gaps identified	Quantitative data validation

9.1: Section 1: Objective 1, 2

To explore the equity issues in the operationalization and implementation of the scheme data was collected and analysed from both primary as well as secondary sources. Secondary data was retrieved from the ambulance services' routinely recorded data, supplied as Epi info data sets. A total of 116562 calls from April-July, 2011 were analysed. Profile of all cases who utilized the ambulance services was assessed according to their socio-economic status, demographic characteristics, reason for service usage and outcome at discharge. Different characteristics of emergency services such as, timelines, call frequencies and geographical access were also studied.

For primary data collection, three districts (Hisar, Ambala and Narnaul) in Haryana were selected on the basis of extent of utilization of ambulance services which was on the basis of number of calls received per day. Hisar had highest usage, Ambala had usage in medium range and Narnaul was among districts with lower usage levels. Beneficiaries of ambulance services were interviewed using semi structurred interview schedules to know their perceptions regarding timeliness, quality and responsiveness of services (Annexure). In each district selected, facilities covered included at least one Apex referral hospital at the district level, one community health center (CHC) and one primary health center (PHC). The CHC and PHC were randomly selected (Table 5). A team of 2 graduate level investigators collected data using a semi-structured interview schedule from 90 individuals reporting in emergency department of the hospital who had utilized the ambulance service. A total of 90 controls who had not utilized the HSVS service for travel from the same hospital were also interviewed during the same period. These ninety patients in each group were selected on the basis of an assumption that 50% of those patients not utilizing government ambulance reach within 1 hour of onset of emergency and that the

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probability of reaching within one hour of onset of emergency improves among the users of ambulance service (odds ratio 2.5). Power of the study was assumed to be 90%, at a significance level of 5%. These individuals were interviewed to elicit time incurred to reach hospital, cost of transportation, and patient outcomes at discharge. In addition an assessment of the severity of incoming patients' conditions was made using Five-level triage systems[13] by Medical officers/ Staff nurses and patients were given severity levels ranging from Level 1corresponding to most severe cases requiring immediate life-saving intervention, Level 2 (High risk situation) till level 3, 4, 5 (requiring use of different resources ; many, one and none respectively)

The data was also analysed to find out the extent of improvement in geographical access. For this utilisation of ambulance service was analysed at each level i.e. PHC, CHC, District hospital. Data was also analysed to assess the utilisation by time of day to assess the effect of referral service on 24×7 functioning of these institutes.

Data on the socio-economic status of households utilizing as well as not utilizing the ambulance services was used to generate a distribution of households according to wealth status, and their ranking by wealth quintile. Households, ranked by wealth quintile, were then compared for utilization of the ambulance services. In order to explore income based inequalities in ambulance service usage in the three selected districts, concentration curve was also plotted and concentration index calculated by plotting the cumulative percentage of the utilisation of the ambulance services against the cumulative percentage of the sample, ranked by living standards, beginning with the poorest, and ending with the richest (x-axis).

Table 5: Facilities covered for data collection

Hospital code	Users	Non users
2 District Hospital	184(68.1)	191 (70.7)
3 CHC/FRU	39(14.4)	52 (19.3)
4 PHC	47 (17.4)	27 (10)
Total	270	270

9.2: Section 2: Objectives 3, 4

The cost of delivering ambulance services in three districts of Haryana was estimated keeping in mind the economic perspective in which cost to health system was estimated. Moreover, annualisation of the cost of capital goods over their useful lives taking into consideration future time costs was also done.

Cost data was collected for all the three districts under study, for the period 2010 using a costing tool (Annexure). The analysis incorporated the costs incurred at both the district and the state level. The different cost heads were identified and cost incurred on each head was assessed. Details of different cost heads studied are shown in the figure below:

Figure 3: Different cost heads assessed in detail for calculating cost incurred by the system

Besides the above shown areas, resources spent at State level for supervision and monitoring, information education and communication (IEC) and the cost of administrative support were also elicited. Resource and output data for two ambulances belonging to Hisar district were excluded from the analysis entirely, on account of them being discontinued due to a mishap. Financial records for the year 2010 were assessed to gather the cost data for capital and recurring expenditures. For human resources, full-time equivalents were calculated for each staff member. Staff members involved in activities other than referral services were interviewed to elicit information on the time spent by them on each activity on a normal day. Information pertaining to salaries was deduced from the pay slips of the staff. For space and infrastructure costs for ambulance services were based on the estimate for the rental price of a similar space. Most ambulances were donated, so purchase price was unavailable. Current market prices (current replacement cost) of similar vehicles were utilized[14]. Vehicle logbooks were reviewed to obtain data on the kilometres covered, number of patients transported and petrol consumption. Wherein information regarding prices of the other equipments was unavailable, on account of them being donated, Haryana government contract rates were utilized[15].

Standard assumptions regarding the life of the equipment, discount rates were made[16]. In the case of certain equipments, where no standard was being followed, expert opinion was sought. For analysis of data collected capital expenditure was annualized (which involves spreading out the costs of capital goods over time periods) over the useful life of the asset to arrive at the equivalent annual cost. Annualization was done to take into consideration the discount rate (time preference for money and inflation) and the lifespan of capital equipments. The space cost was calculated by multiplying the estimates of floor size of rooms devoted to referral services with

local commercial rental prices of similar space. The costs incurred at the state level were apportioned equally for all districts. Average costs as Indian National Rupees (INR) per km and INR per patient transported were estimated. These were computed by dividing the total costs on capital equipments, space, personnel, overheads, consumables with the kilometres travelled annually by ambulances in the first case and with the number of calls received annually in the second scenario. Additionally, the costs of ambulances at each ambulance station point were also ascertained. Not all ambulances were operational for the entire year. So, we apportioned all fixed costs in accordance to the period they were in operation. All recurrent costs were allocated based on the proportion of patients transported by the ambulances. To overcome the problem of missing data (extent of missing data being 6.5%) on diesel consumption, relationship between kilometres covered and diesel consumption was established using standard regression based imputation techniques[17].

In order to estimate the efficient scale of operation for ambulance service, the average cost on kilometres travelled for each ambulance station was regressed. A quadratic regression equation as defined below was estimated using SPSS version 17.0 statistical software.

$AC = \beta 0 + \beta 1Q + \beta 2Q2 + \varepsilon$ where:

AC denotes average costs in INR per km, Q denotes kilometres covered by ambulances; ε represents all of the other factors that affect the level of average cost that cannot be measured and that are not explicitly included in the analysis. $\beta 1$ was expected to be negative, suggesting that as output rises, average costs fall. Also, $\beta 2$ was expected to be small and positive. Thus, at

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large levels of output (and therefore at very large levels of output squared), average costs may start to level off or even increase, as the positive effect of β2Q2 offsets or dominates the negative effect of β1Q. It is the combination of; β1, whose negative slope indicates economies of scale, and β2, whose positive slope indicates diseconomies of scale, that produces the characteristic parabolic, or U, shape of the average cost function. To ascertain the optimal number of patients to be transported per month, a linear regression technique was used to establish the relationship between the number of patients transported and kilometers travelled monthly.

Sensitivity Analysis

Finally, a univariate sensitivity analysis was performed for Ambala district to ascertain the sensitivity of unit costs to changes in the underlying assumptions. Each assumption was varied by 20% on either side of the base value. SensIt version 1.45 software was used to perform the required calculations and a tornado diagram was generated to graphically represent the results. Since the average life of ambulance had a single largest effect on unit cost, we varied this assumption from 5 to 12 years (base assumption 8 years). Also costs incurred after the reference period (purchase of ambulance kit) were looked into separately to judge their impact (if any) on unit costs.

9.3: Section 3: Objectives 5

As mentioned already for an in-depth review of scheme was conducted using Focused group (FGD) discussions which also acted as social audit of the referral system. The FGD guidelines were prepared based on the conceptual frame work on social audit for referral system. The FGD

was conducted using revised guidelines based on the responses found from the first round of FGDs. (Annexure). A total 9 FGDs were held. One meeting was held with each of the groups of service providers (SPs), community workers (CHWs) and the users of referral services (users) in the above mentioned 3 districts.

Groups were constituted of:

- Service providers: (District Field Officer, Drivers, Referral Transport Officer, Doctors).

- Users: (Pregnant women, Postnatal mothers, Community people who had ever used the ambulance service)

- Community workers: (Auxiliary Nurse midwife, Anganwadi workers and ASHA)

The number of participants in each of the FGD ranged between 7- 11 as demonstrated in Table 6.

Table 6: Number of participants enrolled in FGDs

S.No	Areas	No. of participants		
		Providers	**Users**	**CHWs**
1	Ambala	7	8	6
2	Narnaul	10	8	5
3	Hisar	10	11	7

A research team comprising of 2 researchers trained on conducting FGD was framed. One of the members of the research team acted as 'facilitator' and other as 'recorder'.

The facilitator started with the introduction and obtained the socio-demographic profile of the respondents. Open-ended questions were asked from the respondents to get as much information

as can be obtained. Such questions provided participants an opportunity to express their thoughts and feelings based on their specific situations and experiences.

After conducting focused group sessions, the transcripts of the collected information were prepared. While transcribing, the hand-written notes were used to fill in the inaudible phrases or gaps in the communication. The transcriptions for each of the category were linked to the conceptual framework and effectiveness, timeliness of ambulance services, barriers to use and recommendations for improvement in the ambulance services were the four themes used for health service providers, community workers and users. Narrations have been used to reflect upon the feelings, perceptions, ideas and attitudes of the participants and to make the analysis comprehensive.

9.4: Ethical Considerations

Through- out the research proper research protocol and research ethics were followed for interviewing the patients/their attendants. Patient/attendant's written informed consent was taken before starting the interview and their convenience in spending time in answering the questions was respected.

9. Results

Out of total 35 states/ Union territories in India, Haryana state contributes almost 2 % of the total population and 1.37 % of total geographical area. It has a HDI of 0.644 for the year 2005[18]. The state has an IMR of 51 and MMR of 153. The districts selected under the study have following characteristics in terms of population and area. (Table 7)

Table 7: Background characteristics of the study areas

Characteristics	Ambala	Narnaul	Hisar	Haryana
Composite index #	0.793	0.565	0.638	(0.48- 0.79)
Total Area (Km^2)	1574	1859	3983	44212
Total population	1136784	921680	1742815	25353081
Male: Female	1.13	1.14	1.11	1.13
Under 5 mortality rate#	92.1	97.9	95.3	
Percentage institutional deliveries	55.4	56.8	48.6	46.8
Percentage villages with any government health facility in the district *	37.5	30.2	81.1	49.1

 # Ranking and Mapping of Districts 2006, International Institute for Population Sciences, Mumbai Available from: http://www.iipsindia.org/pdf/05_b_13atab14.pdf
*DLHS 2007-08

10.1: Section 1: Objectives 1, 2- Extent and patterns of Utilisation

It was found that on an average number of calls received in a day for service use were highest for Hisar (76.1) followed by Ambala (68.7). Calculation of rates though depicted a different picture where Hisar lags behind Narnaul (4.8 per l00,000 population per day) , with highest call rate from Ambala district (6.8 per l00,000 population per day).

Table 8: Characteristics of HSVS ambulance users in three selected districts and Haryana state, Apr- Jul, 2011.

Utilisation characterstics	Ambala N= 9296	Narnaul N= 5361	Hisar N= 9763	Haryana N= 116562
Age groups				
0-6 years	0.9	6.1	4.3	1.9
7- 14 years	1.1	0.0	1.6	0.7
15-59 years	93	93.1	94	95.5
60 years and above	4.6	30.0	1.3	1.7
Mean age (years)	28.1	23.2	23.6	25.4
Sex				
Female	7322(82.2)	4479 (90.6)	2912 (82.5)	99176(88.3)
Male	1582(17.8)	465 (9.4)	618 (17.5)	13156(11.7)
Region				
Rural	7750(83.6)	4966 (92.6)	8495 (87)	99793(86.2)
Urban	1523(16.4)	392 (7.3)	1105 (11.3)	15948(13.8)
Average number of calls received per day	68.7	43.8	76.1	869.8
Calls per lac population per day	6.8	4.8	4.7	3.8
Utilisation by the time of day				
2 am- 8 am	10.9%	17%	15.4%	10.9%
8 am- 2 pm	45.1%	36%	39.2%	45.1%
2 pm- 8 pm	26.3%	27.5%	27.7%	26.3%
8 pm- 2 am	17.7%	18.2%	18.2%	17.7%
Public health facilities being utilised*				
Primary Health Centre	1327 (26.02)	71 (2.41)	1633 (29.79)	
Community Health Centre	780 (15.29)	647 (22.04)	1498 (27.33)	
District Hospital	2992 (58.67)	2217 (75.53)	2349 (42.86)	
Mean distance travelled per call (Km)	33.4	45.88	29.83	35.04±79.3

*Rest of the percentages not mentioned here were for cases dropped to private hospitals, homes or some other sites.

A vast majority of HSVS users in Haryana state belonged to age group of 15-59 years (93-95%), were women (88.3%) and residents belonging to rural areas (86.2%). The difference between rural-urban and male female utilisation at the state level was found to be significant at ($z = 2.82$, p= 0.016) and ($z= 256.6$, $p< 0.001$). However no significant difference was found in users profiles in the three districts. The services were being used mostly between the time from 8 Hrs – 14:00 Hrs(45%). Less than one- third (29%) users availed HSVS service during night time (20:00 Hrs- 8.00 Hrs). Among three levels of public health facilities in the state, district hospitals in all the three districts under study were found to have received maximum number of HSVS users (25-40%). Mean distance travelled by ambulances per call in the state is 35.04 Km ±79.3 with highest mean distance covered in Narnaul district.

Table 9: Effect of distance from facility upon utilisation of emergency ambulance services.

Distance (Km)	Users (n= 270)	Non- users
0-10	101 (37.5)	159(59.6)
11-20	87 (32.3)	54 (20.2)
21-30	48 (17.8)	26 (9.7)
31-40	15 (5.6)	12 (4.5)
41-50	11 (4.1)	10 (3.7)
>51	8 (2.6)	6 (2.2)

Utilisation of ambulance services also varied with distance from the facility, as being a user or non- user was significantly associated with distance from facility. Odds of being a user among people who belonged to more than 10 Km radius was found to be 2.46 (95% CI: 1.72- 3.54) times that of non-users (χ= 26.36, p- value= < 0.01).

HSVS services in the state were found to be provided not only for emergency medical purposes but for other reasons as well (Table 8). 32.6 % of the total usage was devoted to dropping patients back to their homes. Pregnant women (75.9%) constituted the largest proportion of service users among different medical conditions for which the services were being used by non-referral cases. Transportation of road side accident victims to appropriate health facilities constituted almost 10% of the total usage in the same category.

Division of the study population revealed only 14.6% (39) users to be belonging to the richest quintile. The remaining service users were found to be almost equally distributed among the remaining four income quintiles. The difference in number of users between various wealth quintiles was found to be statistically significant (Chi square= 12.16, p = 0.016).

The utilisation of public sector emergency services was found to be pro- rich (Concentration index= 0.05) among those who used private means of access. This service was used predominantly by the poor among those who utilised HSVS services (Concentration index value= - 0.05), an indication that the HSVS service was making health care utilization more equitable from income perspective.

(Figure 4)

Figure 4: Concentration curve of ambulance service users and non- users
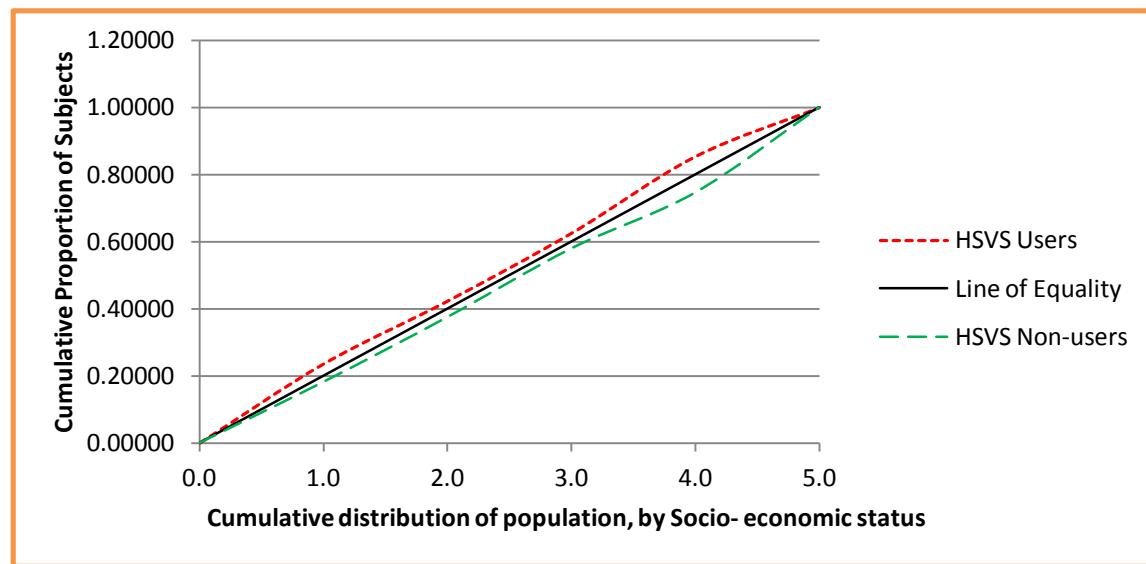
Patients coming on their own (n=270) to the hospital for availing emergency services, were found to be spending an average of INR 349.13± 1428.16 as compared to patients brought free of cost by the HSVS ambulance service.

Average time taken by the ambulance to reach the site of emergency after receiving the call was found to be 18.8 minute in HSVS users whereas the time taken by vehicle to reach the site was 30.8 mins in non-users. Average time taken by HSVS ambulance to reach hospital from site of emergency was 21.7 min, where as in case of non- users, the mean time taken by the vehicle arranged to bring patient to hospital was 9.7 minutes. Most of the users assigned 10 minutes as the time taken by the ambulance to reach at the site of emergency after calling, more than 90% said the ambulance reached in less than 30 minutes time interval. Only 9.6% of the patients who used HSVS ambulance reported to have been brought to hospital in less than 8 minutes from the site of emergency. 80 percent of the patients were brought to the hospital within half hour of reaching the site of emergency whereas the percentage for same in non-users was found to be 73.3%.

Figure 5: Timeliness of Emergency transport service in Haryana State, Apr- Jul, 2011
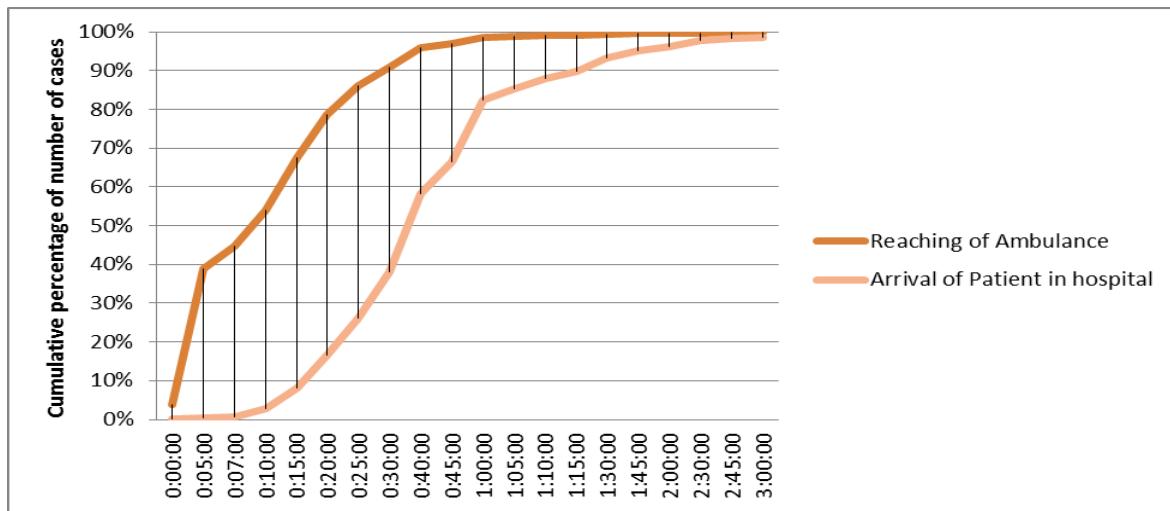
Table 10: Pattern of Utilisation based on reasons for which services are being availed (Apr-Jul, 2011)

Purpose of HSVS utilisation	
a)	**Operational reasons (116562)**
Transportation of cases to health facility	46663 (40.1)
Transportation of cases from health facility to home	38085 (32.7)
Inter- facility transport to higher centres	24074 (20.7)
Others	7740 (6.5)
b)	**Medical reasons (270)**
Abdominal pain	1(0.4)
Injury/burn	1(0.4)
Cardiac/cardio vascular	2(0.7)
Diabetes	1(0.4)
Fever (infections)	4 (1.5)
Neonatal emergency (upto 1 month)	0
Paediatric emergency (upto 12 years)	0
Normal delivery	190 (70.4)
Obstetric emergency	34(12.6)
Respiratory	0
Stroke	2(0.7)
Others	35(13)

*Others include emergency conditions, vehicle usage for medical escort, and usage of vehicle against standard protocols set for usage of vehicles.

Table 11: Timeliness of transportation of users of emergency transport service to health facility, April - Jul, 2011

Time from receipt of call to arrival in hospital	Ambala	Narnaul	Hisar	Haryana
Within first 5 mins.	0.5% (0.5)	2.6% (2.6)	0.4% (0.4)	0.4% (0.4)
6- 10 mins.	3.2% (3.7)	1.3% (3.9)	5.3% (5.7)	2.4% (2.8)
11-15 mins.	7.8% (11.5)	2.3% (6.2)	11.1% (16.8)	5.3% (8.1)
16- 30 mins.	33.7% (45.2)	10.3% (16.5)	47.6% (64.4)	30.1% (38.2)
31 mins- 1 hr.	41.4% (86.6)	39.3% (55.8)	35% (99.4)	44.1% (82.3)
1 hr- 2 hr	11.2% (97.8)	31.7% (87.5)	0.4% (99.8)	13.9% (96.2)
>2 hr	2.2 % (100.0)	12.5% (100.0)	0.2% (100.0)	3.8% (100.0)

Figures in parenthesis represent cumulative percentage

Among 26 % of the total ambulances of the three districts, inspected for physical infrastructure and quality parameters, majority (86.7%) were found to be equipped with blankets, fire extinguisher, stethoscope, manual operated machine. Thermometer, stainless steel waste bin, cervical collars (hard) were found in 53- 73% of the ambulances. But, I/V fluid bottles and the list of names, phone numbers, designation of Medical officers were found in only 33.3 % and 20 % of the ambulances respectively. None of the ambulances observed were found to be fulfilling the entire criterionlaid down by the authorities concerned. One ambulance in Narnaul had none of the instruments or equipment's in it. The emergency kits that have been placed in the ambulances were also not being used anywhere. In Ambala district, these had been removed from ambulances citing lack of usage and fear of getting stolen as reasons.

Paramedics did not accompany the ambulance in Ambala and Narnaul at all whereas in Hisar, though paramedics went but the percentage was still very low (16%).

Of the total Ambulance service users in the state as well as in three districts under study each, 99% of the patients were reported to be discharged alive. It was found that only 1.1% patients (n=3) and 3.7% patients (n=10) had severity levels of 1 and 2 respectively, among users of the ambulance services. 67.4 % of the users and 51.1 of the non-users belonged to level 4.

Among the 270 users interviewed, 63% of the users said they felt satisfied from the services provided, 35.9% were very satisfied and only 1.1% was somewhat satisfied with the services being provided.

In 54.1 Percentage cases (n=146) non user of HSVS had heard of any ambulance service in his/ her state/city. 53.3 % of the non- users had heard of HSVS Ambulance service. Only 14% (n= 22) of the non- users tried calling HSVS Ambulance service for transporting the patient to the hospital. Failure of call to connect and inability to complete the call were the major reasons due to which they were not able to use the ambulance services despite calling. In addition, in some cases it was found that dispatch was denied owing to caller belonging to some areas belonging to other state.

Among 42.6% of the users (n=115), ASHA was the source of information about the emergency referral scheme. However, attending doctor/paramedic (33%, n=89), past users (7.4%, n=20), hoardings (5.6%, n=15), news- paper (3.7%, n= 10) also provided the information regarding the scheme to the patients. Aanganwadi- worker neighbours and relatives also play role as information providers.

10.2: Section 2: Objective 3, 4 -Cost efficiency of services

The service utilization was found to be variable across districts. Hisar recorded the highest number of patients transported at 18420, while 18032 and 7993 patients were transported in

Ambala and Narnaul. In Narnaul district, an ambulance travelled 45.88 kms per patient referred while the distance travelled per referral in Ambala and Hissar was 33.41 and 30.58 kms respectively.

Cost Analysis

It was found an annual cost of INR 9.9 million, INR 8.5 million and INR 5.4 million was incurred by Haryana Government to operate ambulance referral services in Ambala, Hisar and Narnaul respectively with an average per district cost of INR 8.2 million. Salaries for personnel forms the biggest chunk of total costs (49.5%) followed by consumables (23%) largely involving costs incurred on petrol/diesel and non-consumables (15.7%) which includes mainly expenditure on procurement of ambulances in Ambala district as shown in Table 12. Similar break up of costs was observed for the other two districts. Average cost per patient transported of Rs.674 in Narnaul compared to Rs. 549 in Ambala and Rs. 463 in Hisar was also estimated. The ambulance services costs the Government on average Rs 15.5 per km travelled. The cost per km is the lowest for Narnaul at Rs.14.7 though other districts are not far behind. The figure for Hisar and Ambala stands at Rs.15.1 and Rs.16.4 respectively. The revenues earned from Above Poverty Line (APL) patients as a percent of total costs in Ambala, Hisar and Narnaul were 6.8%, 11.32%, 15.38%. The net unit costs have also been computed and enlisted in Table 13.

Table 12: Annual Costs of Referral Transport Services in Haryana, 2010[†]

Major Heads	Annual Costs*		
	Ambala	Narnaul	Hissar
Personnel	4895703.74 (49.5)	1940107.01 (36)	3938418.10 (46.2)
Equipment/ Non-consumable	1551858.47 (15.7)	1180137.93 (21.9)	1685824.40 (19.8)
Consumables	2281810.86 (23.1)	1673311.86 (31.1)	2356870.37 (27.7)
Capital	71485.71 (0.72)	105085.71 (1.95)	81085.71 (0.95)
Overheads	417703 (4.2)	370339 (6.9)	385520 (4.5)
IEC Costs	679790 (6.9)	116500 (2.2)	77158 (0.91)
Total	9898352.11	5268981.84	8447718.10

* Figures in parentheses represent percentages

Table 13: Unit Cost Estimates for the Referral Transport Services in Haryana

Unit Costs	Ambala	Narnaul	Hisar
Costs Per Call	548.93	673.77	462.81
Costs per Km	16.43	14.69	15.14
Net Cost Per Call	511.54	570.13	410.38
Net Cost Per Km	15.31	12.43	13.42

Net cost is total cost less revenue earned.

Additionally, had the ambulance kits been used during 2010 in Ambala and Narnaul, assuming all else the same, the total annual costs in the two districts would have been INR 10.01 million and INR 5.49 million respectively. The unit costs are not affected significantly.

[†] Various cost heads clubbed in the table: Equipment/ non consumables include maintenance costs and assets. Overheads include the cost of land- line, mobile and electricity bills, insurance and GPS rent.

Average cost was most sensitive to changes in the useful life of the vehicles (2.1% variation on the higher side and 3.2% variation on the lower side), loosely followed by variations in discount rates (0.6% variation in average costs on either side of base value). Changes in the rest of the assumptions had minimal impact on the average costs. (Figure 6)

Figure 6: Sensitivity of Estimated Unit Costs to underlying Assumptions
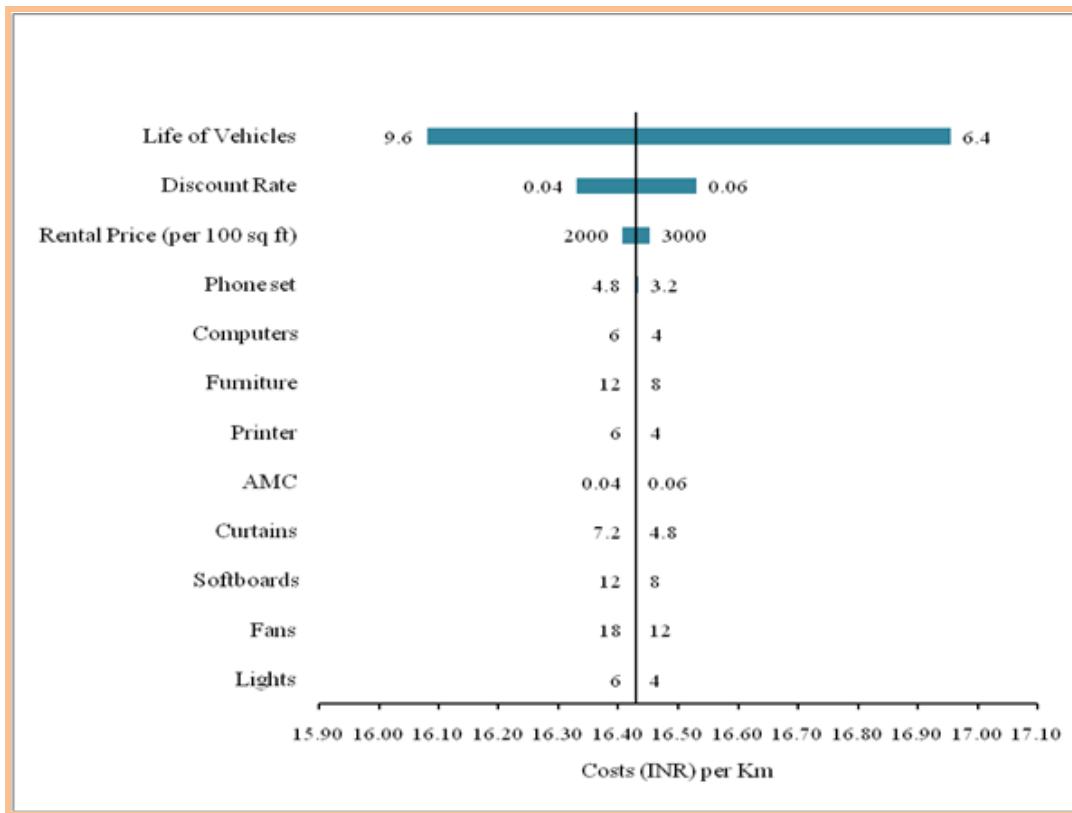
Average cost varied from Rs.15.7 to Rs.17.7 with the variation in assumption for average life of vehicle from 12 to 5 years respectively.

Figure 7: Sensitivity of Estimated Costs to Assumed life of vehicles
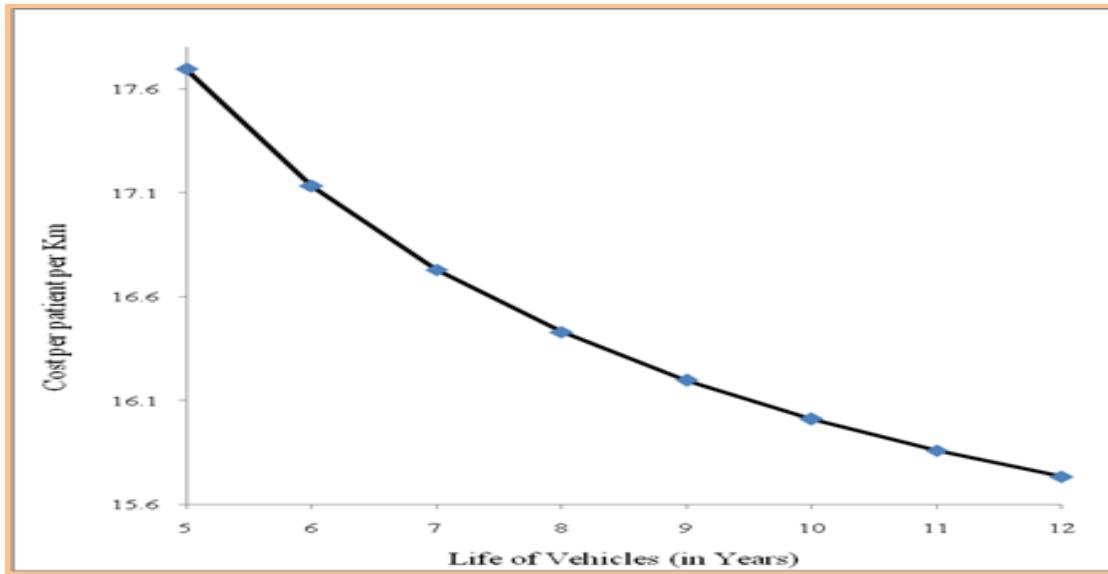
Regression Results

It was found that the regression model explained over 74 percent of the variance in average costs. In addition, the coefficients were found to be statistically significant (p < .001). The estimated equation is given by:

$$\tilde{A}C = 35.36 - 0.001\tilde{Q} + 9.74202*10^{-9}\,\tilde{Q}^2$$

The minimum efficient scale of operation for an ambulance as determined by minimizing the estimated average cost function is 51451 kilometres annually (Figure 8). Attainment of this level would enable unit cost to reduce to Rs.9.57. Using a relationship between number of patients transported and kilometres covered we found that an ambulance should optimally cater to 137 patients in a month.

Figure 8: Average Cost (INR per km) curve for Referral Transport Service in Haryana, 2010
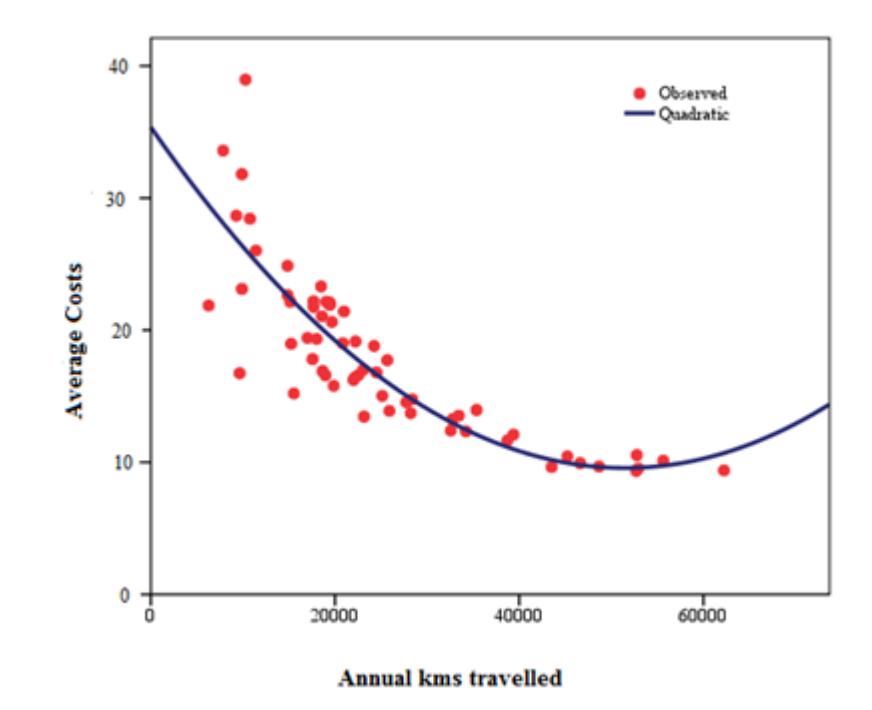
10.3: Section 3: objective 5 - Social audit of the scheme

The results for focussed group discussions have been classified under three sub sections:

Sub Section-I provides a comparison between health service providers (SPs), community workers (CHWs) and users on the basis of knowledge, experiences, barriers and recommendations; Sub- Section-II deals with the comparison among the 3 districts; Sub -section III explains the overall scenario of the services as viewed by all the 3 categories of respondents.

10.3.1: Sub-Section I: Comparison between health service providers, community workers and users

1.   Knowledge

a)   Level of information about ambulance services

Service Providers: Majority of the SPs could provide the information about the launch of scheme, nodal officer responsible (DTO/ RTO) and services provided under the scheme. Regarding the purpose of launching this service, majority of them replied that the ambulance service was started to improve the health care of people. The service providers in one of the districts added to it that it was introduced to reduce the maternal mortality rate or the cases of mortality caused due to road accidents, to save the lives of the people in the first hour known as 'golden hour' of the emergency. Regarding the affordability of this service, they said that the ambulance service is provided free of cost.

CHWs: Majority of the community workers (CHWs) were vague such as *'ye to bohat saalo se chal rahi hai' (It is operational since many years); 'shayad do-teen saalo se'* (May be from 2-3 years)*,* etc. They also mentioned the categories for which service is rendered free of cost.

Users: Most of the users were aware that ambulance can be called by dialling a toll free number 102. None of the user was aware of the date of roll out of ambulance service but they did mention *'pichle saal se'* (last year only), *'do-teen saal se* (for the past 2-3 years)', *'abhi thode din pehle hi shuru hui hai* (started only in few days)'.

The awareness about the ambulance service was found to be maximum among the service providers as compared to the users and community workers. The users and community workers did not know the minute details of the ambulance service.

b)   Level of information about the beneficiaries

SPs: They were aware of the user- fee charged and the different categories for which service is provided free of cost even the eye donation cases were listed which other groups did not.

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CHWs: Majority of the community workers said that the ambulance service is free for the BPL families. It is also provided to the pregnant mothers and antenatal cases. It was also reported that the population other than pregnant women and BPL family are charged Rs. 7/km for utilizing this service.

Users: Majority of the users replied that the ambulance service is meant for the pregnant women and BPL families.

c)   Source of information

The service providers and community workers were asked the source of spreading information and the beneficiaries were asked about the source of receiving information about the ambulance service.

SP's: Few SPs reported that they conducted IEC activity in their respective areas to spread information about the ambulance service. The pamphlets and handbills were distributed among the community people for generating awareness during the first year of the launch of the ambulance service. Radio talks and T.V. shows were also organized. The service providers added that ASHA workers are appointed to inform the people about this service during their house visits. Further, 102 is printed on the ambulance with dark red colour on 10 different spots for enhancing the visibility of the ambulance service. Majority of the ANMs and AWWs replied that when users come for check-up in the CHCs or PHCs, the doctor or the ANM write the information about the ambulance service including number for calling ambulance, driver's number, etc. on their prescription slip.

CHWs: The CHWs reported that they distribute pamphlets for generating awareness about the ambulance service, inform people during home visits, and write information on the patient's slip.

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ASHA workers have been entrusted with the responsibility to conduct IEC using different strategies such as wall paintings, radio and TV shows in order to disseminate the messages on ambulance service.

Users: The users informed that they have been informed about this service or scheme by the ASHA/ ANM or nurse posted in their areas. Almost each user responded that the ambulance service is free for the pregnant women and BPL families.

The service providers in all the three districts organized IEC activities for the awareness of the ambulance service during the first year of the launch of the service. ASHAs, print media and electronic media were found to be the main sources of information for the community workers as well as users.

2.   Perception

a)   Benefits of the Swasthya Vahan Sewa No.102: After gathering information regarding the knowledge level of the respondents about the ambulance service, the question arose whether the respondents have found it beneficial or not? The respondents were asked about the benefits of the ambulance service.

SPs: The SPs acclaimed that according to them, the number of institutional deliveries has increased through the provision of the ambulance service. As one of the medical officers narrated *'Dhansu PHC me pichle mahine 86 deliveries hui hai or iska record bhi hai'* (86 institutional deliveries have been recorded in the Dhansu PHC last month). Doctors are now available 24x7. Few SPs also agreed that the perception of the community people about the services of the hospital has changed as the anecdotes say *'Logo ki soch me tabdili ayi hai. Ve ab private se sarkari hospital me aane lage hai'* (People have started to visit government hospital for

treatment in place of private hospitals). Death rate has also fallen but the graph has shown increase in death rate as the exact number of deaths were not reported earlier which has now become possible due to the provision of the ambulance service.

CHWs: The CHWs believed that the ambulance service has resulted in the increase in the institutional deliveries and maternal and infant mortality has decreased. The community people knew about this service and they are also availing this service. The utilization of the ambulance service is on increase.

Users: The users perceived this service to be beneficial. First of all, this service costs them nothing or is provided on a very subsidized rate. The ambulance reaches within 10-15 minutes and lessens a chance of any kind of delay in seeking treatment. One of the respondents narrated *"Maa or baccha dono bachh jaate hai kyunki waqt par hi unki jaanch ho jaati hai"*. There is no restriction of time to call the ambulance. It can be called anytime in the day or night at the time of emergencies. They find the ambulance service very convenient as it helps them to reach early to the hospital.

As per the service providers and community workers, the community people have begin to prefer institutional deliveries for home deliveries after the launch and promotion of this service. This may be due to the factors such as 24x7 availability of the ambulance service; a time of just 10-15 minutes taken by the ambulance to reach the required spot; availability of facilities such as BP apparatus, oxygen cylinder, blanket, stethoscope, delivery kit, water camper, first aid kit, glucose bottle, etc.

3.   Challenges

a)   Problems faced while delivering or availing the ambulance service: The respondents were asked to report any challenges in providing or utilizing the 102 ambulance service. The nature of challenges differed in all the three groups of respondents.

SPs: The main challenge faced by the service providers was that no paramedical staff other than the driver is available on the ambulance. The problem arises when ambulance carries a delivery case and delivery takes place in the ambulance only. And also in case of accident cases where drivers are not able to provide the first aid single handed. One of the data entry operators reported "Cases of receiving fake calls in the control room have also been reported which hinders the functioning of the ambulance service". There were incidences where drivers were also beaten up by the family members of the users either because the ambulance could not reach in time or the driver did not agree to take the patient to the nearby private hospital as he is bound to take the users to the government hospital. One of the drivers narrated *"Hum gaddi me akele jaate hai aur kayi bar emergency ki haalat me hume oxygen nahi lagaani aati jiss ki vajaha se patient ki life khatre me aa jati hai''* (We are alone in the ambulance and sometimes, we cannot provide first aid in case of emergency which may fatal for the patient).

Regarding the funds, control rooms were found to be sanctioned an amount of just Rs. 1,000 per month to be spent on phone bill, stationery, developing and maintaining infrastructure, which the service providers felt, is a very meager amount. The procedure of recording the calls was said to be very difficult. The one attending the calls has to record the incoming calls manually and then feed the same information in the computer software later on for the database. This process is very time-consuming.

CHWs: The community workers reported that no attendant or any paramedical staff other than the driver is available on the ambulance service. Sometimes, this limitation has proved to be harmful for the users. The drivers are not trained to apply first aid and offer first hand treatment to the serious users or the delivery cases.

Users: Although the users did not find any problem in accessing and utilizing the ambulance service being provided by the government. But one of the respondents described that the ambulance carried only one patient at a time. The size of the ambulance van is very small so it could not capacitate more than one patient at one single time. Otherwise, there is no other problem for availing the service. It reaches well in time.

Lack of staff and inadequate funds were reported as the significant challenges by the service providers and the community workers. The users felt problem in the accommodating capacity of the ambulance van.

4.   Suggestions

a)   Recommendations for improving the existing structure of the ambulance service: Last but not the least, the respondents were asked to put forward their suggestions to improvise the ambulance service.

SPs: Majority of the service providers felt a need of the appointment of the paramedical staff for handling and providing the first hand treatment to the users in the ambulance itself; a sweeper for the regular cleaning and washing of the ambulance, an electrician and a mechanic for the maintenance of the vehicle. The sanctioning of the funds should be 'performance-based'.

CHWs: Alike the service providers, the community workers also felt a need of hiring and training the paramedical staff or nurse who should accompany the ambulance.

Users: The users felt that there is a need of a doctor in the ambulance. As one of them reported *"Doctor ke hone se tension nahi hoti"* (The availability of doctors reduces the level of stress or tension). Some of the beneficiaries also reported that the driver should not be restricted to carry the users only to the government hospital rather he should drop the users in a serious condition in any nearby private hospital. Appointment of the required staff, regular trainings of the existing staff and performance-based funding were few of the suggestions recommended by the respondents to improvise the ambulance service.

10.3.2 Sub Section II: Comparison among the three districts

Table 14 : Comparison of knowledge levels in three districts of Haryana	
Level of information about ambulance services	Hisar> Ambala> Narnaul
Awareness levels	Hisar> Ambala> Narnaul
Information about beneficiaries of scheme	Ambala> Hisar= Narnaul

Source of information in three districts:

Hisar district: It was found from the Hisar district that an IEC activity was once or twice organized to generate awareness about the ambulance service and its benefits. Activities like organizing radio and TV shows, distribution of pamphlets and handbills have also been conducted to spread awareness regarding the ambulance service.

Ambala district: In the Ambala district, the use of ASHA worker was made to the maximum for informing the community about the ambulance service. Writing the details of ambulance service on the prescription slip was also found to be an active way of transmitting information among the community people.

Narnaul district: Information was spread in this district through wall paintings, television and radio. CHWs in the poor performing district did not respond to the question whereas in Ambala CHWs said that they inform the expecting mothers and their family members by visiting their houses.

2.   Perception

a)   Benefits of the Swasthya Vahan Sewa No.102: All the three districts witnessed the improvement in the health care delivery following the introduction of the ambulance service.

Hisar district: The community people have started utilizing public health facilities in place of private facilities in the Hisar district as it is provided free of cost and further reaches within 10-15 minutes of time.

Ambala district: It was found that poor people and those living in distant areas could avail the health care easily by using the ambulance service.

Narnaul district: The ambulance service is provided free of cost and reaches well in time.

Almost all the three districts found the ambulance service to be beneficial. No significant differences were found among the responses provided in the three districts.

3.   Challenges

a)   Problems faced while delivering or availing the ambulance service

Hisar district: The better performing district reported lack of funds provided under the head of contingency to be spent on phone bill, stationery, developing and maintaining infrastructure. The recording of calls, both manually and electronically, is a very time-consuming process. Another major problem was reported as the availability of the inadequate and incapable staff.

Ambala district: Problem of receiving fake calls and incidents of violence with the drivers of the ambulance van were described as challenges in the just performing district.

Narnaul district: The Narnaul district found difficulty with the accommodating capacity of the ambulance van as it could not carry two users at one time.

4.   Suggestions

a)   Recommendations for improving the existing structure of the ambulance service: All the three districts felt a need of the appointment of a doctor exclusively for the ambulance service, the paramedical staff for handling and providing the first hand treatment to the users in the ambulance itself; a sweeper for the regular cleaning and washing of the ambulance, an electrician and a mechanic for the maintenance of the vehicle.

Hisar district: One of the suggestions from the Hisar district appeared that the sanctioning of the funds should be 'performance-based'.

Narnaul district: A community worker in the Narnaul district suggested that the ambulance should also carry the pregnant women for ANC check-up. This step will facilitate the practice of institutional delivery.

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10.3.3: Section III: Overall Scenario

1.   Knowledge: The knowledge level of the respondents in all 3 categories was assessed at three levels: awareness about the referral services; users of the schemes and source of information about the ambulance service. The service providers in all the three districts were aware of the ambulance service. Majority of them considered ambulance service useful that has been started to improve the health care. Majority of the users had knowledge of the availability of the ambulance service in their area. They knew about the referral post. The community workers also knew about the provision of ambulance service in the state and knew how to call it. None of them was sure regarding the date of launch of this scheme. The fact that the service is free of cost for people living below poverty line was known to most of the service providers, community workers and users across all the 3 districts.

The knowledge about the initiation of service and users of ambulance service was not similar in all the districts among providers. Same is true for community workers and users themselves. Source of information varied among the 3 groups and the 3 districts. ASHAs, print media and electronic media were found to be the main sources of information.

2.   Perception about benefits: It was found that the introduction of the ambulance service has resulted in increasing the number of institutional deliveries and reducing MMR and IMR. Reporting of the accident as well as death cases has considerably improved. The determining factors include 24x7 availability of the ambulance service; time-effectiveness of the ambulance i.e. it takes just 10-15 minutes to reach the required or needy place/spot; availability of facilities such as BP apparatus, oxygen cylinder, blanket, stethoscope, delivery kit, water camper, first aid

kit, glucose bottle, etc. inside the ambulance and its cost-effectiveness i.e. free of cost or charge subsidized rates.

3.   Challenges: Lack of requisite staff, scanty funds for contingency and maintenance of the vehicle, small structure of the ambulance, incidents of violence with the drivers, lack of capacity of the staff to deal the emergency cases in the ambulance and provide first aid to the injured cases were all reported to be the challenges of delivering and receiving the ambulance service.

4.   Recommendations: Appointment of the requisite staff, capacity building of the existing staff, public private partnership and broadening the scope of the ambulance service were some of the recommendations suggested by the respondents to improvise the existing structure and scope of the ambulance service.

11. Discussion

Utilisation patterns

Utilisation data of the services suggests a pro-female, pro-rural distribution of the services in the state. More over with usage inclined more towards poorer sections of society, it can be safely assumed that principles of social equity are being maintained. This fact is strengthened by results of our concentration curves plotted for users and non- users. However, more utilisation in the morning hours of 800 hours- 1400 hours and increased load on district level hospitals due to referrals from periphery need to be given immediate attention for further service improvement.

Service quality

Majority of ambulances used for transportation were found to be lacking operational use of necessary equipment for emergency stabilisation, while patients had no intervention at the scene or during transportation. Absence of paramedics in the ambulances, observed in more than 90% ambulances in the study, is another matter of serious concern. An ambulance service has the major responsibility for getting the right patient to the right hospital within as short a time frame as possible. The timelines that the emergency services under study are coming up with are not at par with the international standards. The most widely cited performance framework for ambulance services is the ORCON standards calls, which specifies that in Non-Metropolitan Services, 50 per cent of calls should receive response time within 8 minutes and 95 per cent within 20 minutes. Our services lag far behind this criterion.

Cost efficiency:

Under optimal scenario, we found that the most efficient level for operating an ambulance was with a patient load of 137 and a mileage of 4287 km per month. Our results indicate that major

proportion of total costs comprises of the salaries paid to the staff (35% - 49%; varying across districts). About 90% of the ambulances in Haryana were operating on an inefficient scale. Even in the same district costs per km were highly variable, some ambulances faring better than the others.

Information access

The results of the present study that almost all the beneficiaries were aware that the Haryana Swasthya Vahan Sewa no.102 has been introduced for the below poverty line people (BPL) and for pregnant women are similar to the earlier studies conducted elsewhere.7 At the same time, they were all aware that ambulance can be called at any time by dialling 102 and it is free of cost. The rate of utilization of transport was satisfactory most of them have used it because it has been properly advertised by the government when it was launched. The ASHA worker also played significant role in providing information to the beneficiaries about the 102 ambulance. Apart from this the providers said that the service is also free for the freedom fighters and for the people who have consented for eye donation this statement is supported by the narratives from the respondents.

Man-power issues

The major implementer in the scheme is the driver who is handling the entire emergency situations single handed. No other paramedical staff has ever been available. This is an indication to employ regular paramedical staff for the referral vehicle. Delay in availing referral service occurs at two levels: one at the transport level when vehicle reaches late and another when the referred user does not immediately receive the care. Drivers were beaten by the user because the ambulance could not reach them on time was reported in the just performing district. Delay in

reaching could be the non-availability of transport facility, road conditions, distance of health facility from home, difficult terrain. Even when a patient reaches a health facility, delays can occur in receiving timely, appropriate and sufficient care owing to inadequate facilities and supplies, lack of human resources, which could be a reason for such incidences to take place.

Overall users and community workers are happy with the services of the 102 ambulance with the only apprehension that it could reach them on time. There were certain recommendations shared by the groups during the focused group discussion to improve the service. The service providers suggested that there is a need of extra paramedical and medical staff for handing any emergency situation. It is essential to have a trained staff to look after users, on the other hand, the users feel secure in the company of a doctor10 and they feel that same should be placed in the ambulance.

Strengths and limitations:

Strengths:

1. Majority of earlier studies on ambulance services in the country were descriptive in nature, exploring the system level issues for performance improvement. One of the strengths of this study is the exploration of the scheme from the point of equitable distribution of resources. There are a few studies that have focussed on evaluation of health system costs of publicly provided services in India[19,20,21]. Most studies have concentrated on out of pocket expenses incurred by individuals while availing health services[22,23]. And if we confine ourselves to referral transport services, there is one attempt at calculating costs to the government of providing those services, to our knowledge. A study on evaluation of CATS was conducted by Planning Commission which estimates the expenditure per call in the range of Rs. 1554 to Rs. 1768[24]. But the

results are not comparable to our study and scores low in the methodology adopted. We have taken a more comprehensive approach of costing from an economic perspective. We were able to compute the provider costs for representative district in Haryana.

2. To our knowledge this is a first attempt to compute the efficiency in delivery of public provision of health services from India.

3. This study had another advantage of being set within a state level implemented scheme, so that the analysis of processes allowed investigators to draw lessons that were applicable not only to this scheme across the state but also can be applied to the other similar schemes going on in different states.

Limitations:

1. One of the limitations of the study was variability of data quality, which showed improvements over time in tandem with the improvements in monitoring system (From excel based data entry to epi- info based data entry , data entry errors and their improvements over period of time, decreased missing data over time) .

2. The individual morbidities, that patients presented with, could not be documented in the study as same patients were found to be given different ID's each time he/she was referred from one centre to other. Due to this overlap researchers limited themselves to the major categories under which patient falls.

3. We were confronted with the problem of missing data during data collection. But the percentage of missing data was quite small to have had a significant impact of the validity of our results. Purchase price was unavailable for some vehicles and equipments which would have otherwise been used with GDP deflators to arrive at current costs.

However, to tackle this, current prices were used[25]. Even though few assumptions have been made regarding the life of capital equipment and discount rate but as the sensitivity results point out the assumptions don't affect the robustness of the results. Our regression equation doesn't account for timeliness of ambulance services. However, preliminary findings from our study suggest that about 82% of patients were transported to a health facility within an hour.

4. The primary objective behind initiation of this service was to cater to the needs of pregnant women, which reflected in pro- female distribution of services but an area that the study has left unexplored is the contribution of transport services towards increase in institutional delivery rate in the state. Linking the increase of the institutional delivery rate to the referral transport services directly was difficult as it was not possible to disentangle the effects of referral from other components. A major driving force behind this increased usage might be the maternity benefit schemes such as Janani Suraksha Yojana/ Navjat Shishu Suraksha Karyakram. This aspect needs to be researched further.

The policy to use emergency referral transport services for ante natal check- ups and non-medical purposes is an issue that needs deliberation, considering the limited resources at hand. Availability of less than one ambulance per Peripheral health institute in the state, unfulfilling the laid population norms wherein 3 to 6 ambulances are required per PHC, does not help the matters either as the norm seems unrealistic considering present demand and supply of the resources[26]. Instead attempt can be made to adopt a priority dispatch system instead of currently followed traditional approach in responding to emergency calls[27].

- We should always evaluate our present endeavours keeping in mind the future needs. The ambulance service under study though seems to deliver resources in an equitable fashion, still needs lot of improvement in terms of time lines, patient selection protocols, monitoring of data entry and report generation. Our study found that there is a need for introduction of an effective triage system to classify patients into emergency, and non-emergency calls; and provision of paramedic in the ambulance during patient transportation. Ambulance services models adopted in developed countries can be looked into for service improvement. Enough evidence is there which can be applied in our settings as per our resources. Such evidences should be gathered and applied suitably for system improvement.

Evaluation/ Study results of different ambulance services in developed countries that can be looked upon:

- An "Emergency Ambulance services report" of Ireland suggests introduction of standard patient history report form which can be helpful in many ways.

- Ambulance services should adopt comprehensive performance frameworks.

- Ambulance services should provide an increasing range of other services, e.g. in primary care, diagnostics and in health promotion[28].

Through our analysis we try to bring to the fore the inefficiency in provision of referral transport services. As stated above, there is a potential for improving the efficiency of the services.

IEC costs constitute a minor proportion of total costs. It may be considered to increase spending to increase awareness about the service to increase utilization rates. Emphasis needs to be on increasing the utilization for referral transport services. IEC costs constitute a minor proportion (0.91% - 6.9%) of total costs in the three districts. Preliminary findings of our study suggest that 46.7% of the non-users of the study were unaware of the services. It may be considered to increase spending to increase awareness about the service to increase utilization rates. This view is supported by an assessment of the referral transport scheme for emergency obstetric care under RCH I conducted in Rajasthan, which concluded that lack of information among non-users as the single most important factor distinguishing them from users of the service[29]. However an important caveat deserves attention that, demand generation is not an end in itself. It needs to be supplemented by strengthening of the capacity of health system[30,31,32].

Our findings suggest that utilisation of health services is low in PHCs and CHCs. Maximum users (25% - 40%) under the study, availed services at the district hospitals. Another finding of the study that merits attention is that the service utilization was concentrated (45% of the users) during the timeframe 8 a.m. – 2 p.m. Pointing in the same direction, evidence from DLHS-3 (38) reveals that only 38.3% of the PHCs in Haryana were functioning round the clock. Another cause of concern is the grossly inadequate number of trained physicians and health workers. To substantiate, only 13.1% of CHCs in Haryana have an Obstetric Gynaecologist and Paediatrician as per the DLHS-3 survey. This evidence points to the urgency with which to address these health system bottlenecks if progress towards maternal and child mortality is to be made.

12. Table 15: Key issues and recommendations

Issues	Recommendations
Quality of services	• Up-gradation of ambulances from being mere transport vehicles to life support vehicles by ensuring availability of trained paramedical workers and supplies. • Doctor on call for consultation through call centre. • Up-gradation of peripheral facilities in terms of infrastructure and ability to respond to emergencies so that they can respond effectively and efficiently to the community needs. • Regular monitoring of ambulance service infrastructure against set standards or comprehensive performance frameworks. • Further research to set realistic timelines based on local conditions. Ambulance relocation studies are recommended to be undertaken.
Man power	• Incorporate paramedics and undertake capacity building of Para-medics and drivers. Para- medics should be trained in assessing patient condition and informing doctor while handing over patient
Widen population coverage	• To increase demand, especially among higher income groups it is recommended to make the services free to all income groups.
Monitoring issues	• In epi- info data entry forms - All fields should be made 'required' to decrease missing data. - All possible options should be listed as drop down menu to minimize spelling errors. - Monitoring trends of referral levels across a period of time should be done. - Regular analysis of data on facility-wise utilization should be tracked
Awareness	• Demand raising via more intensive IEC by devising strategies to increase usage by higher income groups.
Performance based funding	• Districts can be paid based on calls attended or Km travelled for efficient use of resources as well as to keep staff motivated.
Traditional approach for call response	• Introduction of triage and Priority based dispatch system[‡] for ambulances is recommended.

[‡] A structured method of prioritizing requests for ambulance and first responder services based upon highly structured telephone protocols and algorithms. Its primary purpose is to safely allocate available resources among competing demands for service.

13. Annexures

13.1 Descriptive Characteristics of emergency service usage Haryana

Tables and Figures

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13.1 Descriptive Characteristics of emergency service usage Haryana

In this section of report description has been given regarding usage of emergency services in the three districts under study and in state. The results compiled under this section belong to information gathered during the review of literature done prior to conducting the evaluation as well as results that have not been made part of initial text of the report. Information has been listed to facilitate the future research in the area.

Table 13.1.1: Socio-demographic characteristics of users and non- users of Ambulance services

	Users(270)	Non users(270)
Mean Age (years)	24.2	32.1
Gender		
Female	265(98.1)	181(67)
Male	5(1.9)	89(33)
Caste	n=180	n=188
SC	85 (47.2)	71(37.8)
ST	3 (1.7)	1 (0.5)
OBC	48 (26.7)	58(30.9)
Others	44 (24.4)	58 (30.9)
Education status		
Illiterate	87 (32.2)	86 (31.9)
Literate	9 (3.3)	6 (2.2)
Primary 5th	54(20)	49 (18.1)
Secondary/ middle 8th	37 (13.7)	36 (13.3)
Higher secondary 10th	45(16.7)	56 (20.7)
Senior secondary 12	24 (9.0)	24(8.9)
Graduation	12 (4.5)	10 (3.7)
Post graduation	2 (0.8)	3(1.1)
Occupation		
Labourer	155 (57.5)	114 (42.2)
Business	11(4.2)	9 (3.3)
Farmer	26 (10)	41 (15.2)
Govt.Job	15 (5.7)	15 (5.6)
Non- worker	31 (11.4)	44 (16.3)
Private job	25(9.6)	26 (9.6)
Self employed	5 (2)	19 (7.0)

Professional	1 (0.4)	2 (0.7)
Residence		
Slum	3(1.1)	2 (0.7)
Rural	253 (94.1)	176 (65.2)
Peri urban	6 (6)	50 (18.5)
Urban	7 (2.6)	38 (14.1)
Mean distance of place of residence from health facility (Km)	17.6	14.3
Mean monthly income	6122.9±5466.4	8331.0±14639.3

Table 13.1.2: Medical causes for utilisation of emergency services by HSVS users and non- users

	Users	**Non users**
Abdominal pain	1(0.4)	6 (2.2)
Allergic reactions	0	8 (3)
Injury/burn	1(0.4)	25 (9.3)
Cardiac/cardio vascular	2(0.7)	7 (2.6)
Diabetes	1(0.4)	0
Disasters	0	0
Epilepsy	0	0
Fever (infections)	4 (1.5)	56 (20.7)
Neonatal emergency (upto 1 month)	0	3(1.1)
Paediatric emergency (upto 12 years)	0	1 (0.4)
Normal delivery	190 (70.4)	67 (24.8)
Obstetric emergency	34(12.6)	19 (7)
Respiratory	0	9 (3.3)
Stroke	2(0.7)	6 (2.2)
Others	35(13)	63 (23.3)

78.7% of users who cited others as reason for using ambulance services had come for ante-natal check-ups. Among 88.8% of the users and 86% of non-users site of emergency situation was their home.

Table 13.1.3: Decision maker for utilisation of referral services by HSVS users and non- users

Decision makers	Users (n= 270)	Non users(n=270)
Self (patient)	3 (1.1)	33 (12.2)
Family members/friends/colleagues	128 (47.4)	209 (77.4)
Police		2 (0.7)
Doctor/paramedical personnel	60 (22.2)	6 (2.2)
ASHA	77 (28.5)	12 (4.4)
Others	2 (0.7)	7 (2.6)

Table 13.1.4 ASHA's as decision makers in three districts among users of HSVS

District	ASHA as decision maker (%)
Ambala	32 (36)
Narnaul	26(28.9)
Hisar	19 (21.1)

Only 2 cases among users (0.7%) were found to be police cases and only in one case police accompanied the patient. In non-users however, 15 (5.6%) cases were police cases and among them, in 76.9 % of the cases police did not accompany the case. Among users of the service, in 266 (97.8%) of the cases patient was accompanied by someone during transportation, where in 26.6% of the cases patient was accompanied by more than one person. Among non-users, the cases where someone accompanied the patient during transportation were found to be 232 (n= 270).

Table 13.1.5 Profile of persons accompanying the patient during transportation by HSVS users and non- users

	Users (n=266)	Non users (n=232)
Family members/friends/colleagues	174 (65.9)	21 (93.1)
Police	1	4 (1.7)
Medical/paramedical personnel	15 (5.3)	1 (0.4)
ASHA workers	6 (2.3)	
Family members/friends/colleagues along with Medical/paramedical personnel	15 (5.7)	1 (0.4)
	Users (n=266)	Non users (n=232)
Family members/friends/colleagues along with Medical/paramedical personnel, ASHA workers	4 (1.5)	3 (1.3)
Family members/friends/colleagues and ASHA workers	49 (18.2)	4 (1.7)
Medical/paramedical personnel and ASHA workers	1 (0.4)	

No stabilization care was given during transportation to the patients in 261 (96.7%) cases among users and 252 (95.1%) of the cases among non-users.

Table 13.1.6 Profile of Persons who provided the stabilization care to the patient during transportation

	Users	Non users
Family members/friends/colleagues	6	10 (76.9)
Police	0	0
Medical/paramedical personnel	2	0
Others	1	2 (7.7)

In 250 (92.6%) cases, the ambulance reached and picked up the patient from the very site of emergency. Users had to reach a pick up point in 20 (7.4%) of the cases. Mean time taken by users to reach pick up point was found to be 23.3 minutes. In 45% of the cases, user had to just travel for ≤5 minutes to reach the pick up point. Only in one case it took the user 45 minutes to reach the point. 80% of the users arrived at the pick up point by foot. Rest used bikes (2, 10%), bus or tempo (1, 5% each). Most of the users were not found to be spending any money for reaching the pick up points as they were said to be within reach by foot. Maximum amount spent by one of the users was found to be 50 INR.

Table 13.1.7 Profile of arrival among patients reporting to public sector institutions, among HSVS users and non- users

	Users N (%)	Non- users N (%)[*]
At the general parking		58 (21.6)
In the general OPD	78 (28.9)	70 (26)
In the Casualty/Emergency	190 (70.4)	127 (47.2)
Others	1(0.4)	13 (4.8)
Information not available	1(0.4)	2 (0.8)

*Four patients among non-users arrived at the hospital by foot.

Among users, 83.4% of the cases (n=236) reported to have been catered to within 10 minutes of reaching the hospital and provision of medical attention by doctor/ paramedic. Among patients coming to the hospital on their own, proportion of cases being catered to within 10 minutes of arrival came out to be 68.2 %.

In 74.8% ambulance users (n=202), information provided by the call centre operator was adequate and clear. Remaining 25.2% users didn't comment, as for their cases someone else had talked with the call centre operator.

Table 13.1.8 Politeness of the ambulance driver/ staff/ Call centre operator

Politeness rating	Ambulance driver/ staff N (%)	Call- centre operator N (%)
Very polite	136 (50.4)	85 (31.5)
Polite	131 (48.5)	86 (31.9)
Neutral	2 (0.7)	
Rude	1 (0.4)	
Some other person talked so can't say		99 (36.7)

60.4% of the female patients among users (n=265) experienced adequate privacy while using the ambulance services. 34.7 % (n=92) of the patients gave no response to the question.

90.7% of the patients were not accompanied by any paramedical person during their ambulance journey and in all those cases where paramedic accompanied the patient, it was a female paramedic (n= 24).

Table 13.1.9 Decision maker regarding choice of health facility while referral, by users and non-users

	User	Non user
Patient or his family members	165 (61.1)	238 (88.1)
Ambulance driver	2(0.7)	2 (0.7)
Paramedic	25 (9.3)	2 (0.7)
Call centre operator	1 (0.4)	0
Referring doctor / clinician	53 (19.6)	24 (8.9)
Police	0	4 (1.5)
ASHA	24 (8.9)	0

Table 13.1.10 Reasons for bringing patient to the particular health facility among by HSVS users and non- users

Reason	(Users) N (%)	(Non- users) N (%)
Referred by treating doctor in other hospital clinic	66 (24.4)	49(18.1)
Brought by vehicle/ambulance operator on his own	4(1.5)	1(0.4)
Brought by Police on its own	1(0.4)	2(0.7)
Guided by call centre of the ambulance operator	24 (8.9)	0
This was nearest hospital from the site of emergency	132 (48.9)	122 (45.2)
Treatment is free/low cost, in this hospital	31(11.5)	61(22.6)
This hospital/ hospital staff was known to us	5(1.9)	23 (8.5)
Any other reason	7 (2.6)	11 (4.1)
information not available		1(0.4)
	270 (100)	270 (100)

97% of the ambulance user (n=262) patients were found to be successfully stabilized or reported to be out of danger whereas in non-users 88.1% (237) of the patients were found to be stabilized or out of danger. In 146 cases (54.1%) among non-users, subjects had heard of any ambulance service in his/ her state/city. 96.6% among these knew about HSVS services, while 68.8% stated these to be the best available for use.

Table 13.1.11Reasons elicited by non-users for their choice of best ambulance service

Reasons	N (%)
Very quick service	44 (36.4)
Well-equipped ambulance	8 (6.6)
Ambulance staff friendly and competent	3 (2.5)
Good guidance by Call Centre	2 (1.7)
Links with good hospitals	3 (2.5)
Service is free	40 (33.1)
Any other reason	4 (3.3)
Information not available	18 (14)
	122 (100%)

Figure 13. 1.1f Modes of Transport used by non- users of HSVS to bring their patients to hospital
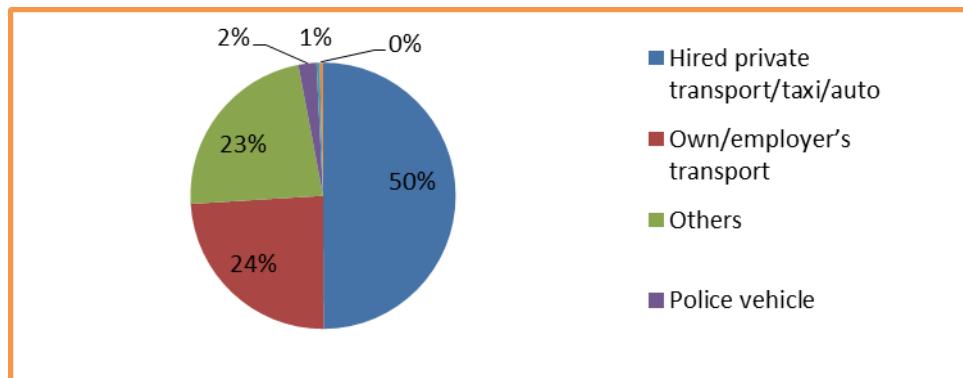
Figure 13. 1.2f Table showing percentage ambulances with different equipments and essentials
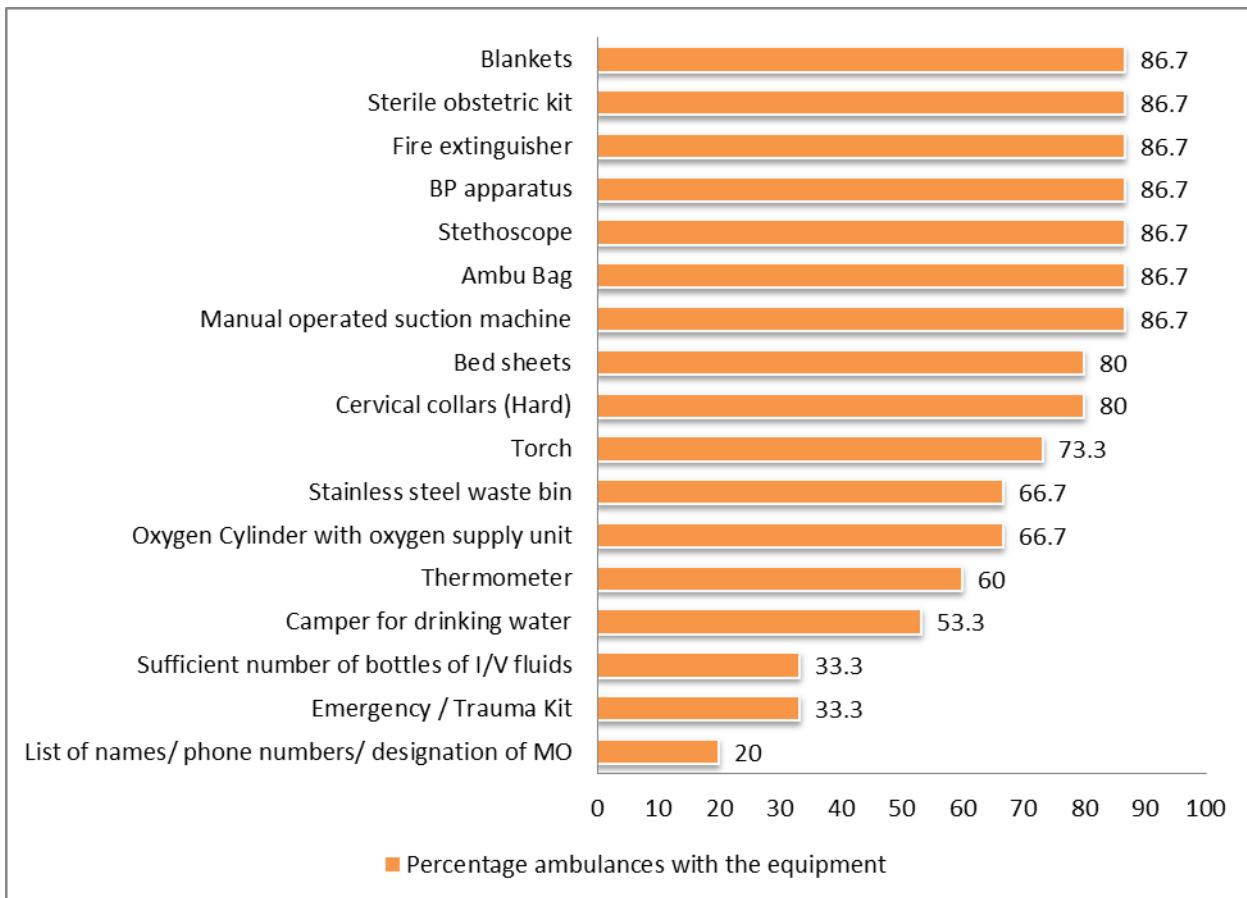
Title of the study: Evaluation of Haryana Emergency Ambulance Services

What is this form: This form explains a research study. Please read this form or listen to our research staff as he/she explains this staff and ask questions which you may have. This study is being undertaken by the School of Public Health, Post Graduate Institute of Medical Education and Research, Chandigarh and National Health Systems Resource Centre, New Delhi.

Why is this study being done? We are doing this study in order to ascertain the effectiveness and timeliness of ambulance services in Haryana in responding to medical emergencies, patterns of use of emergency referral scheme in Haryana, and cost of providing this service to the Haryana Government.

Who will be in this study: A total of 540 patients, admitted in emergency department of public sector health institutions will be recruited from 3 districts in Haryana as part of this study. Your district happens to be one of the districts where we are undertaking this study.

What will happen if you join this study?

- You will be asked questions related to the illness for which you have reported to this hospital
- You will be asked questions related to the travel which you undertook to reach this hospital
- Finally you will also be asked questions related to the money spent by you in order to travel to the hospital

Risks/ Discomfort involved: There will be no or minimal discomfort to you in answering the questions asked by the study team.

Privacy: We will ensure that any person outside of this study will not have access to your data. We will also ensure that there are no personal identifiers in your data form so that it cannot be later linked to you. We will store the information in locked places under the charge of Principal Investigator.

Compensation: There is no cost associated with joining this study. Neither will you be at risk of any physical/ social harm in joining this study. Hence there is no compensation provided as part of joining this study.

Benefits of this study: Information generated from this study will be useful for the Government to improve the ambulance services in Haryana for transportation of patients.

Whom to contact? If you think that you have not been adequately informed about this study or have further queries or you think that you have not been treated well or have been hurt as a result

of joining this study, you should contact the Team Leader of the research team locally, or to Dr Shankar Prinja, Assistant Professor of Health Economics, School of Public Health, PGIMER Chandigarh (+91 9872871978). You can also contact …………………………………., from the Institute Ethics Committee of the Post Graduate Institute of Medical Education and Research, Chandigarh. None of the institutions involved in this study will be liable to any compensation as a result of injury or bad effects which are not the fault of the investigators.

The research is voluntary. You have the right to withdraw from this research at any point of time. Your decision not to join this study will not affect the present or future medical care to be provided to you at this hospital.

Consent: If you have read this consent form, then please sign/ mark a thumb impression at the place specified below.

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Name of patient   Date

--   ----------------------
Name of attendant   Date

Schedule Identification Code ⬚⬚⬚⬚⬚

Review of Haryana Swasthya Vahan Sewa (HSVS)
By

PGIMER School of Public Health, Chandigarh
And
National Health Systems Resource Centre
(Technical support agency under NRHM, Ministry of Health & FW, Govt. of India)

Hospital (Casualty) Patient Interview Schedule
(For patients using the HSVS ambulance)

Note (For the field investigator):

Date of Interview: ___ ___ / ___ ___ / 2011
Investigators' name: _____
Name and location of Hospital:_____
Hospital Code (1: Medical college, 2: District hospital, 3: CHC/ FRU, 4: PHC):
District (1: Ambala, 2: Rohtak, 3: Narnaul):

1. Background Characteristics of the Patient
1.1 Age of the Patient (in completed years)   Years   ⬚⬚
1.2 Sex of the Patient   Male   1
                                Female 2
1.3 Monthly household income:
1.4 Caste:
1.5 Educational status of head of household:
1.6 Occupation of the head of household:
1.7 Place of Residence of the patient
        Urban   1
        Peri-urban   2
        Slum   3
        Rural   4
        Information not available.................   9

1.8 Residential Address of the patient

_____
_____

1.9 How far is the place of residence of the patient from this hospital? (Rounded off to nearest km   ⬚⬚

2. Type of Emergency
2.1 What is the type of emergency the patient is facing? *(as per the respondent)*
        Abdominal pain   01
        Allergic reactions.................................   02

Injury/burn 03
Cardiac/cardio vascular 04
Diabetes 05
Disasters 06
Epilepsy 07
Fever (infections) 08
Neonatal emergency (upto 1 month) ... 09
Paediatric emergency (upto 12 years)... 10
Normal delivery 11
Obstetric emergency 12
Respiratory 13
Stroke 14
Others .... 88 → *(Specify: _____)*

2.2 What is the clinical diagnosis of the type of emergency the patient is facing? *(as per the hospital records...check with the attending doctor/paramedic)*
Abdominal pain 01
Allergic reactions.............................. 02
Injury/burn 03
Cardiac/cardio vascular 04
Diabetes 05
Disasters 06
Epilepsy 07
Fever (infections) 08
Neonatal emergency (upto 1 month) ... 09
Paediatric emergency (upto 12 years)... 10
Normal delivery in labour.................... 11
Obstetric emergency 12
Respiratory 13
Stroke 14
Others .... 88 *(Specify: _____)*

2.3 Where did the emergency occur?
Home 1   Address:
Workplace 2
Other Hospital/Clinic 3
Road/in transport 4
Public place 5
Field 6
Others .... 8 → *(Specify: _____)*
Information not available.................... 9

2.4 Who decided to call ambulance/vehicle?
Self (patient) 1
Family members/friends/colleagues ... 2
Police 3

Doctor/paramedical personnel 4
ASHA…………………………… 5
Others .... 8 → *(Specify: _____)*
Information not available.................... 9

2.5 What was the reason for which the call was made?
    Medical emergency needing attention in a hospital....1
    Pregnant woman in labour   2
    Shift from one hospital to another   3
    Non-emergency   ………….............................. 4,
Please specify: …………………………….

2.6 Is this a Police case?
    Yes 1
    No .... 2 → ***skip to question 3.1***

2.7 Is the Police accompanying the patient to the hospital?
    Yes, they are still with the patient 1
    Police had accompanied but left later 2
    No, they did not accompany the patient 3

3. Mode of Transport
3.1 From where did you come to know about the emergency referral scheme?

    TV
    Radio
    Newspaper
    Billboard
    Past user
    ASHA worker
    Attending doctor/ paramedic
    Others, please specify …………………………..

3.2 Was there anyone accompanying the patient during transportation?
    Yes 1
    No .... 2 → ***skip to question 3.5***

3.3 Who was accompanying the patient during transportation? (Please mark multiple responses if applicable)
    Family members/friends/colleagues ... a
    Police .... b
    Medical/paramedical personnel c
    Others .... d → *(Specify: _____)*
    ASHA…………………………… e
Information not available................... 9

3.4 Was the patient given stabilization care during transportation?
    Yes 1
    No .... 2 → *skip to question3.5*

3.5 Who provided the stabilization care to the patient during transportation?
    Family members/friends/colleagues ... a
    Police .... b
    Medical/paramedical personnel c
    Others .... d → *(Specify: _____)*
    Information not available................... 9

3.6 Did ambulance come to…

    Site of emergency .... a → *skip to question 3.9*
    Or pick up point .... b

3.7 What was the time taken by you to reach the pickup point?
    ☐☐☐ Minutes

3.8 How did you reach the pickup point? (mode of transport) _____

3.9 How much money did you spend on reaching from the point of emergency to the pickup point?
    Rs. ☐☐☐☐

3.10 What was the time taken for the ambulance to reach the site of emergency after calling?
    ☐☐☐ Minutes

3.11 What was the time taken for the ambulance to reach the hospital from the site of the emergency?
    ☐☐☐ Minutes

3.12 Where did the vehicle drop the patient in this hospital?
    At the general parking 1
    In the general OPD 2
    In the Casualty/Emergency 3
    Others .... 8 → *(Specify: _____)*
    Information not available 9

3.13 What was the time duration between reaching the emergency to provision of medical attention by doctor/ paramedic? ☐☐☐ Minutes

3.14 How would you rate the courteousness/ politeness of the call centre operator?
    Very polite
    Polite
    Neutral

Rude
Some other person talked, so don't know

3.15 Was the information provided by the call centre operator adequate and clear? Yes/ No/ Some other person talked.

Please specify
………………………………………………………………………………………………
3.16 How would you rate the courteousness/ politeness of the ambulance driver/ staff?

Very polite
Polite
Neutral
Rude

3.17 If female patient,
3.17.1 Did you experience adequate privacy? Yes/ No/ No response
3.17.2 Were you accompanied by a paramedical person? Yes/ No
3.17.3 If yes, was the attendant a male or female?

3.18 How satisfied are you with the ambulance service that the patient availed for reaching this hospital?

-3	-2	-1	0	1	2	3
Very unhappy	Unhappy	Not satisfied	can't say	somewhat satisfied	satisfied	Very satisfied

4. Out-of-Pocket Expenditure

4.1 Was any expenditure incurred while transporting the patient to the hospital?
Yes 1
No 2   → *skip to question 5.1*
Information not available........ 9   → *skip to question 5.1*

4.2 What was the total amount of expenditure incurred while transporting the patient to the hospital?
Total expenditure incurred: Rs.⬚⬚⬚⬚⬚

4.3 What was the expenditure incurred on while transporting the patient to the hospital?
a. Transport/vehicle hiring: Rs.⬚⬚⬚⬚
b. Medical consumables: Rs.⬚⬚⬚⬚
c. Others: Rs.⬚⬚⬚⬚ *(Specify: _____)*

⬚⬚⬚⬚⬚⬚

5. Not part of this tool
Choice of Hospital

6.1 Who made the choice?
    I or my family members .... a
    Ambulance driver named it .... b
    Paramedic named it c
    Call centre named it .... d
    Referring doctor / clinic named it .... e
    Police named it .... f
    ASHA……………………………………………………..g

6.2 Why was the patient brought to this Facility?
    Referred by treating doctor in other hospital/clinic..….. a
    The vehicle/ambulance operator brought us here .... b
    Police brought us here   c
    Guided by the call centre of the ambulance operator ... d
    This was nearest hospital from the site of emergency ... e
    Treatment is free/low cost, in this hospital .... f
    This hospital/ hospital staff was known to us .... g
    Any other reason ....   h → *(Specify:_____)*
    Information not available..   *9*

6. Any suggestions for better and responsive ambulance service:

7. Patient Medical Condition (To be extracted from medical records/ interview with doctor)

7.1 Please specify the severity of emergency condition of the patient on arrival at hospital?
                                        Level 1
                                        Level 2
                                        Level 3
                                        Level 4
                                        Level 5

7.2 Has the patient stabilised/out of danger? (Ask this question 24 hours after admission or at discharge, whichever is earlier)

    Yes 1
    No   2
    Information not available.........   9

End the interview thanking the respondent
⁎⁎

Review of Haryana Swasthya Vahan Sewa (HSVS)
By

PGIMER School of Public Health, Chandigarh And
National Health Systems Resource Centre
(Technical support agency under NRHM, Ministry of Health & FW, Govt. of India)

Interview Schedule for patients <u>NOT USING</u> the HSVS ambulance

Note (For the field investigator):
_____

Date of Interview: ___ ___ / ___ ___ / 2011   Investigators' name: _____
Name and location of Hospital: _____
Hospital Code (1: Medical college, 2: District hospital, 3: CHC/ FRU, 4: PHC):
District (1: Ambala, 2: Rohtak, 3: Narnaul):

1. Background Characteristics of the Patient
1.1 Age of the Patient (in completed years)
        ☐☐ Years
1.2 Sex of the Patient
    Male   1
    Female   2
1.3 Monthly household income:
1.4 Caste:
1.5 Educational status of head of household:
1.6 Occupation of the head of household:
1.7 Place of Residence of the patient
    Urban   1
    Peri-urban   2
    Slum   3
    Rural   4
    Information not available   9

1.8 Residential Address of the patient

1.9 How far is the place of residence of the patient from this hospital? (rounded off to nearest km)
        ☐☐ Km

2. Type of Emergency

2.1 What is the type of emergency the patient is facing? _(as per the respondent)_
    Abdominal pain   01
    Allergic reactions................................   02
    Injury/burn   03
    Cardiac/cardio vascular   04

Diabetes 05
Disasters 06
Epilepsy 07
Fever (infections) 08
Neonatal emergency (upto 1 month) ... 09
Paediatric emergency (upto 12 years)... 10
Normal delivery 11
Obstetric emergency 12
Respiratory 13
Stroke 14
Others .... 88 → *(Specify: _____)*

2.2 What is the clinical diagnosis of the type of emergency the patient is facing? *(as per the hospital records...check with the attending doctor/paramedic)*
Abdominal pain 01
Allergic reactions................................ 02
Injury/burn 03
Cardiac/cardio vascular 04
Diabetes 05
Disasters 06
Epilepsy 07
Fever (infections) 08
Neonatal emergency (upto 1 month) ... 09
Paediatric emergency (upto 12 years)... 10
Normal delivery 11
Obstetric emergency 12
Respiratory 13
Stroke 14
Others .... 88 → *(Specify: _____)*

2.3 Where did the emergency occur? Give address of the place. (Mention village, block, district or ward)
Home 1   Address: _____
Workplace 2   _____
Other Hospital/Clinic 3   _____
Road/in transport 4   _____
Public place 5   _____
Field 6
Others .... 8 → *(Specify: _____)*
Information not available................... 9

2.4 Who decided to call ambulance/vehicle?
Self (patient) 1
Family members/friends/colleagues ... 2
Police 3
Doctor/paramedical personnel 4

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ASHA…………………………….....   5
Others ....   8 → *(Specify: _____)*
Information not available....................   9

2.5 What was the reason for which the call was made?
    Medical emergency needing attention in a hospital.... 1
    Shift from one hospital to another. 2
    For delivery 3
    Non-emergency...4,   please   specify:
…………………………………

2.6 Is this a Police case?
    Yes 1
    No ....   2 → ***skip to question 3.1***

2.7 Is the Police accompanying the patient to the hospital?
    Yes, they are still with the patient   1
    Police had accompanied but left later   2
    No, they did not accompany the patient   3

3. Mode of Transport

3.1 How did the patient come to the hospital?
    Own/employer's transport   1
    Hired private transport/taxi/auto   2
    Police vehicle   3
    Government run (102) ambulance   4
    Others ....   8 → *(Specify: _____)*
    Information not available....................   9

3.2 Have you heard of HSVS Ambulance service?
    Yes 1
    No ....   2 → ***skip to question 3.6***

3.3 Did you try calling HSVS Ambulance service for transporting the patient to this hospital?
    Yes 1
    No ....   2 → ***skip to question 3.6***

3.4 When you tried to call HSVS, what happened?
    Call did not connect...1 → ***skip to question 3.6***
    Call connected but could not complete the call................2 → ***skip to question 3.6***
    Call connected but dispatch of ambulance was denied.....3 → ***skip to question 3.6***
    Call connected and dispatch was assured...................... 4

3.5 If ambulance dispatch was promised on call, what happened?
    Arranged an alternative transport before the Ambulance came .... a

Ambulance came but refused to take the patient .... b
Ambulance wanted to take the patient to some other hospital c
Ambulance asked for money .... d
Other reason .... e
Specify (_____)

3.6 Was there anyone accompanying the patient during transportation?
Yes 1
No   2   →   ***skip to question 3.10***

3.7 Who was accompanying the patient during transportation? (Please mark multiple responses if applicable)
Family members/friends/colleagues ...   a
Police ....   b
Medical/paramedical personnel   c
Others ....   d   →   *(Specify: _____)*
Information not available....................   *9*

3.8 Was the patient given stabilisation care during transportation?
Yes 1
No   2   →   ***skip to question 3.10***

3.9 Who provided the stabilisation care to the patient during transportation?
Family members/friends/colleagues ...   a
Police ....   b
Medical/paramedical personnel   c
Others ....   d   →   *(Specify: _____)*
ASHA……………………………………   e
Information not available....................   *9*

3.10 What was the time taken for the ambulance/vehicle to reach the site of emergency after calling?   ☐☐☐ Minutes

3.11 What was the time taken for the ambulance/vehicle to reach the hospital from the site of the emergency? ☐☐☐   Minutes

3.12 Where did the vehicle drop the patient in this hospital?
At the general parking   1
In the general OPD   2
In the Casualty/Emergency   3
Others   8   →   *(Specify: _____)*
Information not available *9*

3.13 Has the patient been attended to by qualified personnel in this hospital?
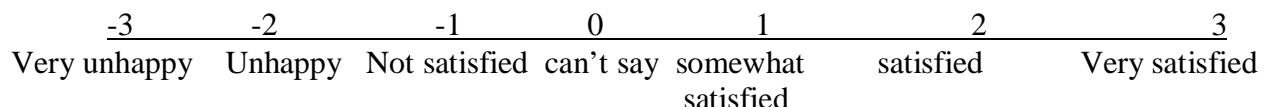   *(Observe and Check with the attending doctor/paramedical staff)*

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Yes 1
No 2
Information not available........ *9*

3.14 What was the time duration between reaching the emergency to provision of medical attention by doctor/ paramedic?

☐☐☐☐ Minutes

In case the patient has come to this hospital by an Ambulance

3.15 How satisfied are you with the ambulance service that the patient availed for reaching this hospital?

-3	-2	-1	0	1	2	3
Very unhappy	Unhappy	Not satisfied	can't say	somewhat satisfied	satisfied	Very satisfied

4. Out-of-Pocket Expenditure

4.1 Was any expenditure incurred while transporting the patient to the hospital?
Yes 1
No .... 2 → *skip to question 5.1*
Information not available........ *9* → *skip to question 5.1*

4.2 What was the total amount of expenditure incurred while transporting the patient to the hospital?
Total expenditure incurred: Rs.☐☐☐☐☐

4.3 What was the expenditure incurred on while transporting the patient to the hospital?
a. Transport/vehicle hiring: Rs.☐☐☐☐☐
b. Medical consumables: Rs.☐☐☐☐☐
c. Others: Rs.☐☐☐☐☐ → *(Specify:* _____*)*

4.4 Did this hospital/hospital staff ask for payments for starting the treatment of the patient?
Yes 1
No 2
Information not available........ *9*

4.5 How much amount did the hospital/hospital staff ask for payments (as advance) for starting the treatment of the patient?
Rs. ☐☐☐

5. Choice of Ambulance service (Only to the individuals where such a service exists)

5.1 Have you heard of any ambulance service in your state/city?
Yes 1
No .... 2 → *skip to question 6.1*

5.2 What ambulance services you have heard of?
HSVS ambulance .... a
Free NGO run ambulance service .... b
Other privately operated ambulance service ... c → *(Specify: _____)*

5.3 Of the above mentioned ambulance service, which one would you rate as the best?
HSVS ambulance 1
Free NGO run ambulance service.................. 2
Other privately operated ambulance service ... 3 → *(Specify: _____)*
Information not available................................. 9 → *skip to question 6.1*

5.4 Why did you rate the above ambulance service as the best?
Very quick service .... a
Well equipped ambulance .... b
Ambulance staff friendly and competent c
Good guidance by Call Centre .... d
Links with good hospitals .... e
Service is free .... f
Any other reason .... g → *(Specify: _____)*
Information not available.............................. 9

6. Choice of Hospital

6.1 Who made the choice?
I or my family members .... a
Ambulance driver named it .... b
Paramedic named it c
Call centre named it .... d
Referring doctor / clinic named it .... e
Police named it .... f
ASHA…………………………………………………...g

6.2 Why was the patient brought to this hospital?
Referred by treating doctor in other hospital/clinic ...... a
The vehicle/ambulance operator brought us here .... b
Police brought us here c
Guided by the call centre of the ambulance operator ... d
This was nearest hospital from the site of emergency ... e
Treatment is free/low cost, in this hospital .... f
This hospital/hospital staff was known to us .... g

Any other reason ....   h → *(Specify: _____)*
Information not available...   9

6.2 Any suggestions for better and responsive ambulance service:

7. Patient Medical Condition (To be extracted from medical records/ interview with doctor)

7.1 Please specify the severity of emergency condition of the patient on arrival at hospital?

Level 1
Level 2
Level 3
Level 4
Level 5

7.2 Has the patient stabilised/out of danger? (Ask this question 24 hours after admission or at discharge, whichever is earlier)

Yes 1
No   2
Information not available.........   9

End the interview thanking the respondent
***

13.4 Costing tool

1. Human Resources (Includes the HR at district level for implementation, supervision and monitoring)

S.No.	Designation	Number of staff	Full-Time Equivalent	Proportion time spent on referral services	Gross Salary	Allowances
	PERSONNEL					
1	Fleet Manager					
2	Computer Operators					
3	Drivers					
4	Sweeper					
	GEN. ADMIN.					
1	DC					
2	*Red Cross Society Staff* (Secretary, Accountant)					
3	*Civil Surgeon Office* (CMO, Deputy CMO)					
4	*Hospital Admin* (RMO, Nodal Officer)					

2. Space/ Building
    2.1 What is the rental price of space in this locality

S.No.	Room No/ Parking Garage of vehicle	Space (in sq. ft)	Activities	Proportion of time spent for management of	Remarks

					referral scheme	
1	Rooms allocated to call centre, Fleet Manager, Drivers etc.					
2	Include Parking Space if a separate space has been demarcated for parking of ambulances					
3	Training Room (if any)					

3. Capital Equipments (includes vehicles, call centre equipment etc)

S.No.	Equipment	Model/ Specification	Quantity	Utility	Proportion time allocation for use in emergency referral scheme
1	**Vehicles**				
2	**Call Centre Equipment**				
A	Furniture (includes tables, chairs, almirahs etc.)				
B	Computer				
C	Printer				
D	Phones				

E	Tube Lights				
F	Fans				
G	Curtains				
H	Soft Boards				
	(include any other such items)				
3	**Ambulance Kit**				

4. Maintenance Expenditure(Equipment/ capital maintenance, récurrent communication charges on mobile phones/ call centre, insurance for vehicles/ staff, compensation for any accident etc)

S.No.	Equipment/ Capital infrastructure	Description	Maintenance cost
1	Vehicles		
2	GPS Rent		
3	Training Costs		
4	Electricity bills		
5	Mobile Phone bill		
6	Landline + Internet		
7	Gen. Insurance Premium		

5. Consumables (Medicines consumed in emergency vehicle, petrol, stationery etc)

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S. No.	Consumable Item	Quantity	Price
1	Petrol+ Diesel		
2	Oxygen Cylinder Refill costs		
3	Stationery		

6. Others (including IEC)

13.5 Prospective record for monthly total household expenditure

1. How much is your approximate monthly spending?
2. How much does your family spend per month on the following items:-

S. No.	Item	Expense
1	Ration (cereals, pulses, edible oil, eggs, fish, meat, salt, sugar, spices, bread, etc.)	
2	Fruits and vegetables	
3	Milk and milk products and beverages	
4	Pan, tobacco, alcohol	
5	Bills (Water and electricity)	
6	Mobile phone+ land line bills	
7	Conveyance and fuel	
8	Rent	
9	Clothing, foot wear	
10	Education	
11	Medical (institutional, non- institutional)	
12	Entertainment	
13	Personal effects (watch specs, toiletries, jewellery)	
14	Domestic help, cook, sweeper, barber, beautician, tailor, priest	
15	Miscellaneous (House hold appliances, furniture, crockery)	

13.6 Data entry forms prepared in Epi- info

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File   Edit   View   Insert   Format   Tools   Help

Patient satisfaction interview schedule   Patient ID
                                                     Group ID

Back ground characteristics of the patient

Hospital code
District
1.1 Age of the patient
1.2 Gender of the pateient
1.3 Monthly household income (INR)
1.4 Caste
1.5 Education status of head of the household
1.6 Occupation fo the head of the house hold
1.7 Place of residence of the house hold
1.8 Place of residence
1.9 Distance of patient's place of residence from the hospital being visited

Type of Emegency

2.1 What is the type of emergency the patient is facing
Specify the emergency
2.2 Clinical diagnosis of the type of emergency the patient is facing
2.3 Place where the emergency occured
2.3 Subpart. Specify others
2.4 Decision to call ambulance/ vehicle was taken by
2.4 Subpart. Specify others
2.5 Reason for which call was made
2.5 Subpart. Specify the non emergency
2.6 Is this a police case
2.7 Is the Police accompanying the patient to the hospital

Mode of transport

3.1 Source of knowledge about the emergency referral scheme
3.1 Subpart Specify
3.2 Was there anyone accompanying the patient during transporatation
3.3 Those who were accompanying the patient during transportation were (a= family members/ friends/ colleagues, b= Police, c= Medical / paramedical, personnel, d= others, e= ASHA, 9= information not available)
3.4 Any stabilisatiob care given to the patient during transportation
3.5 Stabilisation care to the patient was provided by
3.6 Ambulance / vehicle came to pick patient from
3.7 Time taken by patient to reach pick up point
3.8 Mode of transport to reach pick up point
3.9 Money spent on reaching from site of emergency to pick up point
3.10 Time that ambulance took to reach the site of emergency
3.11 Time ambulance took to reach hospital from site of emergency
3.12 Where did the vehicle drop the patient in this hospital
3.13 Delay in availing the emergency service provision
3.14 Courteousness/ Politeness of the call centre operator
3.15 The information provided by the call centre operator was adequate _clear
3.16 Courteousness/ Politeness of the ambulance driver/ Staff
3.17 a Did you experience adequate privacy
3.17b Did para medic accompany you in the ambulance
3.17 c Accompanying para medic is
3.18 Satisfaction socre for the ambulance service availed

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Expenditure incurred during transport

4.1 Was any expenditure incurred while transporting the patient to the hospital
4.3 Expenditure incurred while transporting patient to the hospital
Transport/ Vehicle hiring
Medical consumables
Others
4.2 Total expenditure incurred while transporting
4.4 Whether hospital/ hospital staff asked for paymnsts for starting the treatment of the patient

Choice of Ambulance service (For non users only)

5.1 Have you heard of any ambulance service in your state/ society
5.2 Other ambulance services that have been heard of by the patient/attendant
5.3 Of the different ambulances mentionec by you, which one would you rate the best
5.4 Reason for rating an ambulance service as the best
5.4 a Specify any other reason

6. Choice of Hospital

6.1 Who made the choice
6.2 Why was the patient brought to this hospital only
Suggestions for better and responsive ambulance service

7. Medical condition of the patien:

7. Patient Medical Condition
7.1 Severity of Emergency condition on arrival
7.2 Has the patient stabilised/ out of danger

Mode of transport- non useres specific questions

3.1 How did the patient come to the hospital
3.2 Have you heard of HSVS Ambulance service
3.3 Did they try calling HSVS
3.4 What happened when they tried to call HSVS
3.5 If ambulance dispatch was promised on call, what happened

Time of arrival of patient in hospital

13.7 Focussed group discussion guidelines

BASIC INFORMATION REGARDING REFERAL SERVICE

- Apke area me referral service ko sudharne ke liye kya kadam uthaye gaye hai?

- Ambulances ko bulane ke liye kaun sa number dial karna padhta hai?

- Yeh service kab shuru hui thi?

- Ambulance service kyu shuru ki gayi?

- Yeh service paid hai ya free hai?

- 102 ambulance kahan khadi hoti hai or abhi kitni hai?

BENEFITS

- Is ambulance service ke aane se kya fayada hua hai?

- Kya death rate me bhi koi kami hui hai ya nahi?

CHALLENGES

- Apko is ambulance service ko chalane me kin musibat ka saamna karna padhta hai?

- Kya police department se ambulance ke driver ko koi problem hoti hai?

- Kya driver ke saath kabhi kisi ne bad tamizi ki hai?

SUGGESTIONS

- Ambulance service ko improve karne ke liye aap kya sujhav denge?

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