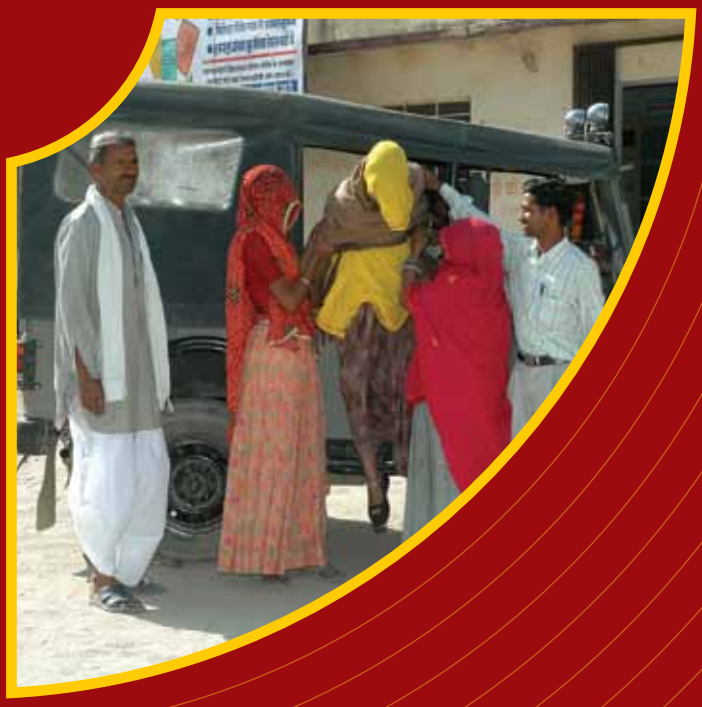
TOOLKIT

OPERATING PERINATAL REFERRAL TRANSPORT SERVICES IN RURAL INDIA



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A TOOLKIT

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Contents

Abbreviations

ABC	Airway, breathing, circulation
ALS	Advanced Life Support
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
AWW	Anganwadi Worker
BLS	Basic Life Support
BPL	Below Poverty Line
BSNL	Bharat Sanchar Nigam Ltd.
CAD	Computer Aided Dispatch
CCO	Call Centre Operator
CEmONC	Comprehensive Obstetric and Newborn Care Unit
CHC	Community Health Centre
CM&HO	Chief Medical and Health Officer
CO	Communication Officer
COO	Chief Operating Officer
CSO	Civil Society Organisations
CUG	Closed User Group
DF	Deepak Foundation
DFID	Department for International Development
DHS	District Health Society
DO	Dispatch Officer
EAG	Empowered Action Group
ECR	Emergency Control Room
EDD	Expected Delivery Date
EMD	Emergency Medical Dispatch
EmOC	Emergency Obstetric
EMRI	Emergency Management Research Institute
EMT	Emergency Medical Technician
EmTF	Emergency Transport Facility
ERCP	Emergency Response Centre Physician
FGD	Focus Group Discussion
FRU	First Referral Unit
GAIL	Gas Authority of India Ltd.
GNM	General Nurse Midwife
GoB	Government of Bihar
GoI	Government of India
GoK	Government of Kerala
HGV	Heavy Goods Vehicle
HR	Human Resource
IEC	Information, Education and Communication
IMR	Infant Mortality Ratio
INGO	International Non-government Organisation
INR	Indian Rupees
JSY	Janani Suraksha Yojana
KSRA	Karra Society for Rural Action
LHV	Local Health Volunteer
LMP	Last Menstrual Period
MDG	Millennium Development Goal

MM	Maternal Mortality
MMR	Maternal Mortality Ratio
MoA	Memorandum of Association
MoU	Memorandum of Understanding
MP	Madhya Pradesh
NGO	Non-government Organisation
NL	Nearest Location
NRHM	National Rural Health Mission
PCR	Pre-Hospital Care Record
PHC	Primary Healthcare Centre
PIP	Project Implementation Plan
PNC	Post-natal Care
PPH	Postpartum Haemorrhage
PPP	Public Private Partnership
PRI	Panchayati Raj Institute
RCH	Reproductive and Child Health
PV	Pelvic
RTI	Reproductive Tract Infection
SBA	Skilled Birth Attendant
SC	Scheduled Caste
SHG	Self Help Group
SOP	Standard Operating Procedure
SMCS	Safe Motherhood and Child Survival (project)
SRS	Sample Registration System
ST	Scheduled Tribe
STI	Sexually Transmitted Infection
WHO	World Health Organisation
ZHL	Ziqitza Healthcare Limited

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The report became possible because of the active sharing of information and knowledge by those managing the referral transport models on the ground: Syed Afzal Ahmad and Shamim Akthar from Karra Society for Rural Action in Khunti, Jharkhand; Archana Joshi and Dr Nandini Srivastava from Deepak Foundation, Gujarat; Mr Tyagi and Kuldeep Saxena from Emergency Management Research Institute (GVK EMRI) in Assam; Dr Ramvir Raghuvanshi and Shennaz Khan from Guna and Nijil Ibrahim, Joemon Thomas and Radheesh V (Ambulance Access for All), and Sweta Mangal and Amit Alexander (Ziqitza Healthcare) from ''1298'' in Kerala.

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This toolkit is dedicated to all those who are making prompt transport of women to health facilities in times of need a reality in rural India.

Background

An effective perinatal referral transport service in rural India that enables a pregnant woman in difficulty to reach a facility at which she and her baby can receive appropriate care, is critical in preventing maternal deaths in India.

There are a number of emergency or referral transport (RT) services currently offering transport to women with obstetric emergencies in rural India. The extent of services and the scale of these systems vary extensively: from the state-wide emergency transport services that use advanced technology and well-equipped and manned ambulances to the community-managed services covering a few blocks and using locally available vehicles.

Box 1.1 Obstetric versus perinatal referral transport services

There is limited experience and evidence of transporting newborns compared with transporting women with obstetric emergencies. This toolkit is prepared on the premise that the womb is the best "transport incubator" and that referral transport for mothers is extremely important for the survival of their newborns. The toolkit therefore uses the term perinatal referral transport services as opposed to obstetric referral transport services. In absence of enough experience of evidence, this toolkit does not, however, provide guidance and standards for transport of sick newborns.

1.1 What is This Toolkit?

This toolkit provides guidance to all stakeholders involved in establishing and operating a perinatal RT service, drawing on the good practices and lessons learned from the range of models operating in rural India.

The toolkit provides simple, easy to use guidelines on the following:

- Key components of an effective perinatal RT service
- Steps to establish perinatal RT service
- Management and administrative arrangements

Given India's scale and diversity, there is no one-size-fits-all RT service. The final shape that a service will take depends upon the context in which it operates and the funds available. This toolkit recognises this, and presents the information on each component primarily in the form of **minimum** and **desirable** characteristics or standards that are required for the service to function effectively. It further provides a set of tools to assist in planning.

Beyond being a reference document for use when establishing and operating a new perinatal RT service, the toolkit can also be useful for appraisal and third-party monitoring of an existing service.

Box 1.2 This toolkit is a reference document that provides relevant information and tools to:

- Undertake situational analysis of an area for planning a perinatal RT service.
- Select an appropriate, context-specific perinatal RT service.
- Set up and manage the identified services.

1.2 Who can Use This Toolkit

You can use this toolkit if you are:

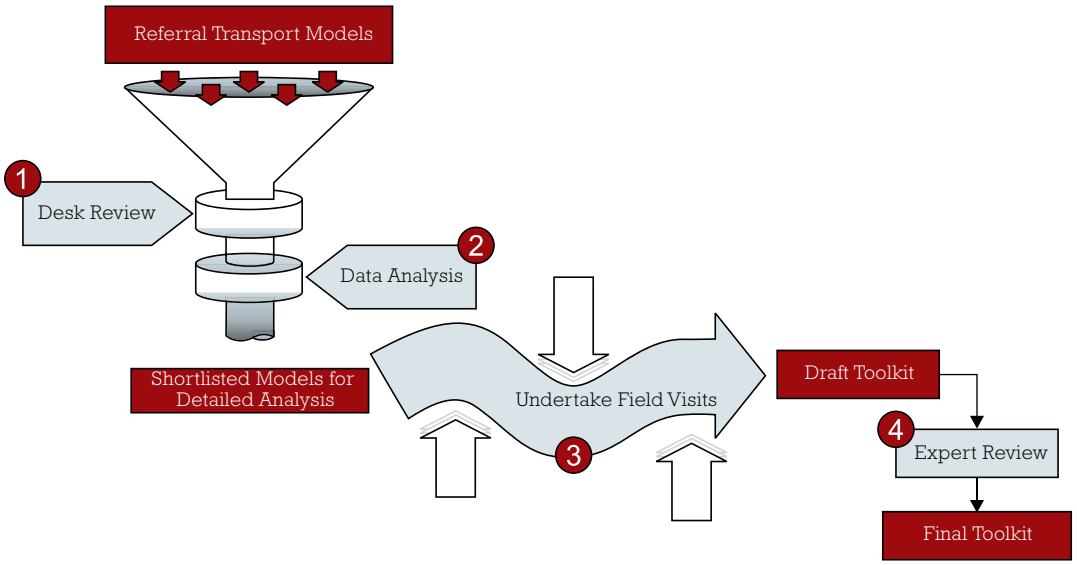
- **A public health administrator** and wish to establish or contract a perinatal RT service, or have already funded such a service and now wish to appraise it for further improvement.
- **An existing emergency transport service provider** and wish to understand what constitutes standards of perinatal RT.
- **A potential emergency transport service provider** and wish to know how to go about setting up an effective and efficient RT service.
- **An investor or donor:** private equity funds, charitable foundations, corporate and development agencies – who wishes to fund an effective perinatal RT service.
- **A non-profit organisation** working on maternal and child health issues at grassroots or advocacy level and wish to set up a community-based RT service.
- **Any other person** with an operational or academic interest in ensuring safe motherhood.

1.3 How the Toolkit was Compiled

A consultative and iterative approach was used to execute the assignment, which was undertaken in four phases. See Figure 1.1.

Phase 1 – Desk review: Involved an in-depth desk review of literature to identify the different RT services operating in the country. For this, various state programme implementation plans (PIPs), evaluation reports, best practices (*Directory of Innovations Implemented in the Health Sector, 2008,* Solution Exchange e-discussions), Popline, newsletters, journals, etc were reviewed. The team also met with and communicated over email and phone with a number of government officials, development agencies and NGOs within India, and from neighbouring countries of Nepal and Bangladesh. Approximately 30 RT models or services were identified through this secondary research.

Figure 1.1: A consultative approach was used to compile the RT toolkit



Phase 2 – In-depth study of select models: Involved studying select models through in-depth analysis, which represent the major "types" of models and provide insights on how these models could be operated in different settings.

Phase 3 – Field visits: Involved visiting the implementing agencies. The visits included a review of secondary data, financial analysis, review of the management and operational system, meetings with government officials, community, staff, beneficiaries and other stakeholders as deemed appropriate. Tools for each of the stakeholders were pre-tested and refined.

Phase 4 – Expert group consultations: Involved rounds of expert consultation on the draft version of the toolkit to get wider consensus on the minimum and desirable standards and characteristics laid down in it. This was done by sending out the draft toolkit to various experts and practitioners for their review, and through a two-day residential workshop session with key experts and practitioners.

1.4 How to Use the Toolkit

Section 2: Landscape of perinatal RT services in India. This section provides a brief introduction to India's maternal mortality status, Government of India's response, and the situation with regards to perinatal RT services in the country. If you are familiar with the landscape of maternal health and referral transport service in India, you may wish to go straight to section-3.

Section 3: Key components of perinatal RT services. This section lists the key components of an effective perinatal RT service and provides detailed information on the different sub-components required for it to function effectively.

For each sub-component, such as for communication, transport, or care during transit, it specifies a set of minimum and desirable characteristics or standards in a tabular form. Based on the available resources and context, you can choose from the minimum and desirable standards to create your own model. If you are interested in appraising an

existing service, you can use these tables as checklists, and identify areas for further improvement.

Section 4: Guidance on operating services in security-affected and remote areas. This section provides specific guidance on additional or different arrangements that may be required to operate an RT service in a security-affected and in a hilly or remote area.

Section 5: Management of perinatal RT services. This section provides guidance on the management of the services including staffing, finances, procurement and maintenance of equipment and vehicles, and contractual arrangements between funder and the RT provider and between RT provider and the referral health facilities.

Section 6: Operationalizing the perinatal RT services. This section outlines a series of basic steps required to operationalize the RT service in a given area. This section will help you to start preparing the operational plan and timelines for setting up a new service.

Annexures: The annexures provide a set of tools that will help in effectively managing the services such as undertaking situational analysis.

Introduction

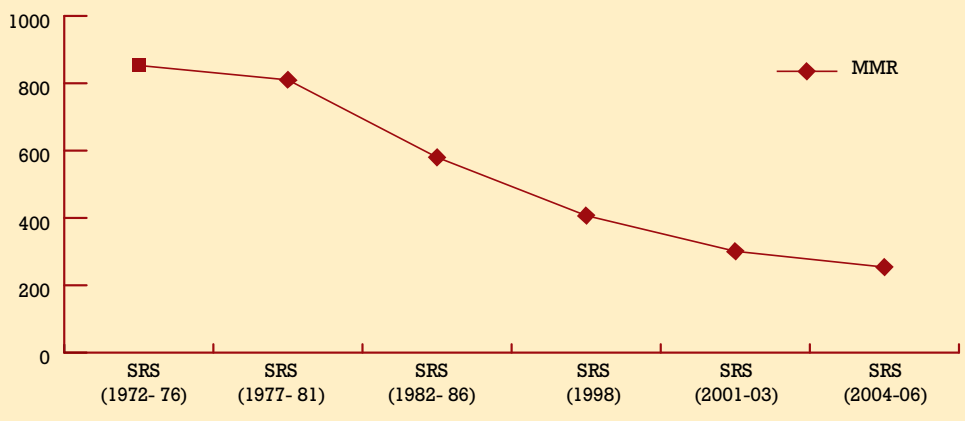
2.1 Maternal Mortality in India

High maternal mortality remains an issue of concern for India. The Sample Registration System (SRS) data, from Census of India for 2004-06, reports a composite Maternal Mortality Ratio (MMR) of 254 /100,000 live births for the country; translating into about 68,000 maternal deaths per year, and accounting for about one-eighth of all maternal deaths in the world.

The good news is that MMR has declined rapidly in the last decade (Figure 2.1). The challenge is to accelerate the decline in MMR – much faster than it has been over previous decades.

Box 2.1: Maternal mortality is defined as death of women while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by pregnancy or its management. The maternal mortality ratio is maternal death per 100,000 live births in one year.

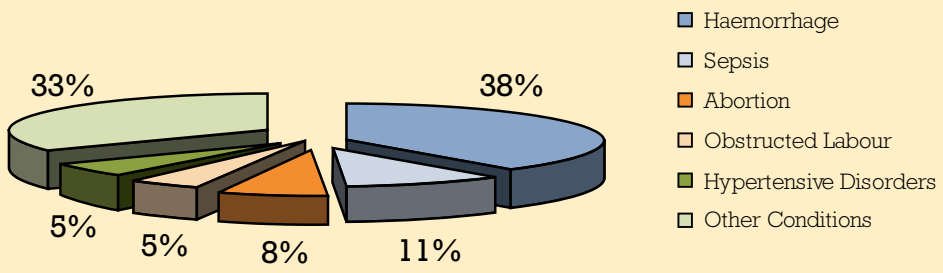
Figure 2.1: MMR in India 1976–2006



2.1.1 India's context

India's size population and socio-cultural context means that it can expect approximately 28-30 million pregnancies per year and approximately 25 million deliveries. Estimates are that 15% of those are likely to develop complications, most of which are unpredictable.

Figure 2.2: Causes of MM in India (SRS 2004-06)



2.1.2 Causes of maternal death

Figure 2.2 shows that the most common causes of maternal deaths in India are similar to that in other developing countries – haemorrhage (ante-partum and post-partum), hypertensive disorders, infection, and obstructed labour. In addition, a significant proportion of deaths can also be attributed (directly and indirectly) to high rates of anaemia.[1]

2.2 Tackling Maternal Mortality

2.2.1 Tackling the three delays

It is now globally recognized that the most effective means of preventing maternal and perinatal deaths are to ensure availability of skilled birth attendants, access to 24-hour (emergency) obstetric care, and strengthening of health systems. A ''Three Delays'' framework is commonly used to assess the critical factors underpinning high MMR. A health system that aims to improve maternal health and reduce maternal mortality needs to address all the three delays:

1. **Delay in decision to seek care:** Many factors influence the decision to seek care, such as ability to recognise complications, socio-cultural barriers to seeking care for women – including women's mobility, ability to command resources, beliefs and practices surrounding childbirth and delivery, and education status of the family members.
2. **Delay in reaching a healthcare facility:** The contributing factors include non-availability of transport facility, road conditions, distance of health facility from home, difficult terrain, and poor economic condition of families.
3. **Delay in receiving care:** Even when a woman reaches a health facility, delays can occur in receiving timely, appropriate and sufficient care owing to inadequate facilities and supplies, lack of human resources, etc.

2.2.2 Government of India's commitment

The Government of India's (GoI) commitment to MMR reduction has been clear for many years. In recent years, and in response to the need to accelerate the rate of reduction, GoI has made significant commitments to improve maternal and child health. The National Rural Health Mission (NRHM) launched in 2005 is a seven-year $9.5 billion programme, aimed at improving health service delivery and accessibility across the country, particularly for poorer and marginalised socio-economic groups.

[1]References from Prof. Dilip Mavalankar's study, available on http://www.azadindia.org/social-issues/maternal-health-in-india.html

Recognizing the importance of institutional deliveries as a cornerstone to reduction of MMR, NRHM has strategically focused on tackling all three delays. See Table.2.1 for key maternal health strategies under NRHM.

Table 2.1: Salient features of NRHM for addressing maternal mortality

	Issue	What NRHM has prescribed
1.	**Demand promotion**	• *Janani Suraksha Yojana (JSY)*, a cash transfer scheme, conditional on delivering in an institution
2.	**Improving public sector services**	• Early detection of pregnancy through pregnancy detection kits • Skilled attendance at birth (domiciliary & health facilities) • Essential and emergency obstetric care • Strengthening health facilities: FRUs and 24-hr PHCs to provide basic and comprehensive emergency obstetric care • Multi-skilling of doctors to overcome shortage of critical specialists (training on life saving anaesthesia skills and emergency obstetric care) • Strengthen referral systems including transport • Safe abortion services – PHC/FRU-level
3.	**Engaging private sector services**	• Accrediting private health institutions under JSY • Fixed package for contracting out services in some states (eg. Chiranjeevi scheme in Gujarat) • Engagement of private sector for RT services
4	**New initiatives**	• Maternal Death Review in the communities and facilities • Name-based tracking systems of pregnant women and infants

2.2.3 Impact of NRHM on institutional delivery rates and the second delay

The *Janani Suraksha Yojana (JSY)* scheme is playing a significant role in promoting institutional delivery. JSY is the provision of cash assistance to a pregnant woman for transportation to a service delivery centre, and for institutional care during delivery and the immediate postpartum period.

Government monitoring data show that from 2005 to 2008, JSY has led to significant increases in institutional delivery: for example in Madhya Pradesh (21.9%), Rajasthan (12.2%), Bihar (11%), and Orissa (10.2%).

On the other hand, even if a woman is willing to seek institutional assistance for delivery, there are a number of persistent issues that may prevent her from doing so (or doing so promptly).

On the supply side, issues include the availability of vehicles, particularly for women living in remote villages. On the demand side, families may not have liquid cash that restrains them from accessing institutional care for safe childbirth. The need for an effective and affordable RT service is, therefore, critical to ensuring that irrespective of the place of residence and ability to pay, women are able to access obstetric services.

2.3 Referral Transport in Rural India

To address the second delay, many states, districts and local communities have set up RT services that aim at providing prompt referral of pregnant women to an appropriate level of health

facility. There is a wide variation in the way these services have been set up or managed. These variations are in terms of scale, management structure, cost, and types of vehicles.

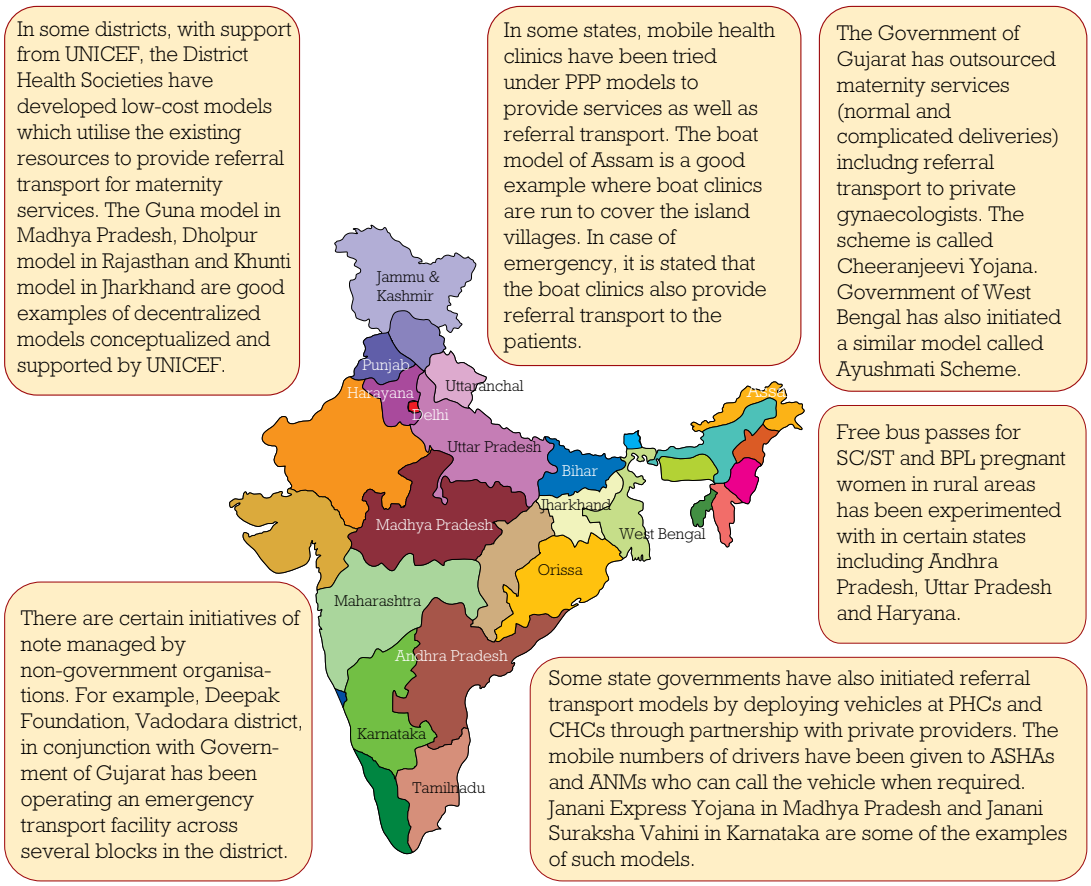
An overview of RT services currently operating in rural India, which cater to all emergencies in general and for obstetric cases in particular, follows.

2.3.1 Referral transport for all

- The "108 Emergency Transport Facility" operated by the GVK Emergency Management Research Institute (EMRI) has the largest coverage in India, now operational in 10 states (Andhra Pradesh, Gujarat, Uttarakhand, Goa, Tamil Nadu, Rajasthan, Karnataka, Assam, Meghalaya, and Madhya Pradesh). A significant proportion of cases attended by the EMRI 108 network are pregnancy-related. For example, in Assam in year 2009, about 32% of all cases transported by "108" ambulances were pregnancy related.
- The governments of Kerala and Bihar have awarded the "108 Emergency Transport Facility" contract to "Dial 1298 for Ambulance," operated by Ambulance Access for All/ Ziqitza Health Care (in Bihar, the contract is for Patna city only). Many other states are contemplating contracting out a state-wide "108 Emergency Transport Facility."
- "Dial 1298 for Ambulance" is also operating a private RT service in Kerala and Maharashtra states. This is promoted as a social enterprise here, using a differential scale-of-user fee (free to full payment) depending on patients, socio-economic status and the hospitals they are referred to.
- Bihar and other states are also operating the "102 Emergency Service" through the government healthcare network.

2.3.2 Obstetric referral transport

Figure2.3 : Highlights of referral transport in India



2.3.3 Summary of situation

- There are many different initiatives to ensure that pregnant women reach the health facility for delivery. Some include the transportation of all pregnant women, while other models focus on transporting obstetric emergencies only.
- Despite the range of exisiting models, a large proportion of women still use informal transport methods to reach the health facility – by foot, cart, public transport, taxi, hired jeep, etc.
- The main RT services appear to be:
    - State-wide ''108 Emergency Transport Facility''. Trained staff and equipment are available with the ambulance to manage emergencies during transit.
    - Decentralised district – or block-level public-private partnership models (such as the *Janani Express Yojana* in Madhya Pradesh): the fleet includes government and contracted private vehicles; and the services are managed by the District Health Society.
    - Decentralized, community-based models in some remote and difficult areas such as in Khunti district of Jharkhand and in Dholpur district of Rajasthan. These models are managed by community-based organizations, and there is significant involvement of communities and private vehicle owners. Typically, the vehicles are not dedicated for RT.
- There are limited organized RT services in difficult or hard-to-reach locations. Despite the model and type of transport being used, there are many cases where vehicles are unable to access ''the last mile'' – reaching the ultimate location of the patient. This is particularly true where there are poor, unmetalled roads, and during rains. In such cases, women have to walk or be carried to a point where the vehicle can be accessed. Findings did indicate that in some places, Sports Utility Vehicles (SUV) and four-wheeled drives are able to better negotiate this last mile.

Box 2.2. Referral transport for all pregnant women or for those with obstetric complications

The concept of maternity referral has been traditionally understood within the context of strategy of antenatal risk screening. However, the low sensitivity and specificity of the risk-screening tools and lack of adherence to referral advice have put risk-screening under scrutiny (Murray et al). A greater understanding of the short time available between onset of complication and death due to the complication has also highlighted the importance of prompt access to a health facility for all pregnant women.

The extent to which RT systems should focus on transporting all women with obstetric emergencies or potential to develop a complication (high risk), or on transporting all women in labour, is an ongoing debate. Capacity at the receiving facilities, availability of alternative transport methods, and the acceptability to communities of elective referrals need to inform programming.

The aim of NRHM is to increase the proportion of institutional deliveries, but there might be limited capacity to cater to all pregnant women. While the transport services may therefore transport all pregnant women, irrespective of the potential or actual complication, the success of such a system should be measured by the proportion of all women with complications who were transported to an appropriate referral level. Complications that need institutional care are expected in 15% of all deliveries. Most models studied for preparing this toolkit offered transport to any pregnant woman who asked for the services, irrespective of presence or absence of a complication.

- Where villages have accessed and used the funds available under the Pradhan Mantri Gram Sadak Yojana scheme for road improvement, accessibility to emergency vehicles has improved.
- Some states have set up or propose to set up Standard Operational Procedures (SOPs) and guidelines for emergency RT.

2.3.4 In-depth review of five models

An initial desk-review of the shortlisted models suggested that they could be categorised into the following three categories:

1. **Community-based models:** These were typically limited to a few blocks, often in areas with difficult terrain and remote locations. They are coordinated by a local civil society organization and often use locally available vehicles for transporting women. The interface with the communities is strong.

The services being operated in Khunti district of Jharkhand (subsequently referred to as Khunti model), and the one operated in Surat district and managed by Deepak Foundation (subsequently referred to as Deepak Foundation model) were identified for in-depth review.

2. **District-based models:** These are managed by the District Health Society, and use a mix of existing government ambulances and private vehicles for transport. The centralised call centre is at the district headquarters. The interface with health systems is strong for this group of models. The Guna model was identified for in-depth review for this group.

3. **State-based models:** These are managed by a professional RT agency, and the unit of management is state. The call centre is located at the state level, and the ambulances are always used for transporting women. These models have a larger scale and operate on higher technology than the other two models. EMRI in Assam and the ''1298'' services in Kerala were identified for in-depth review.

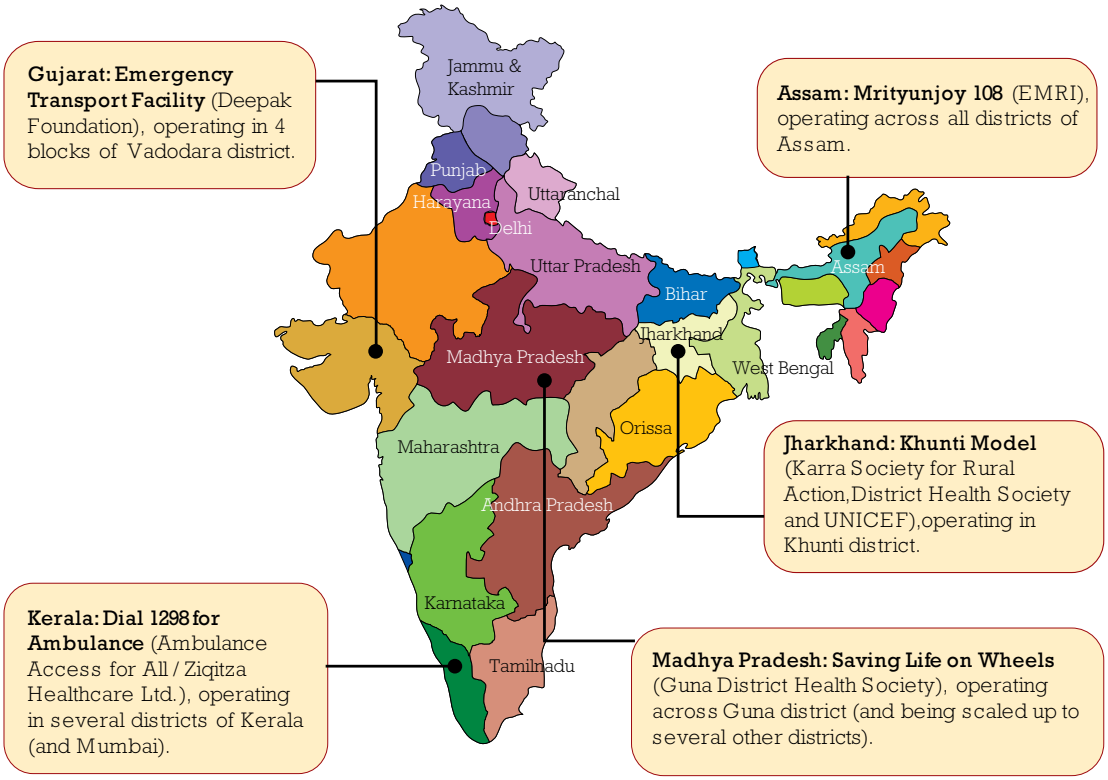
Comparison of these models on some key parameters is made in Table 2.2. Additional parameters for each model are listed in Annex D. Figure 2.4 depicts the location of these models.

Table 2.2: Main parameters used for categorising selected models

Parameter	Guna Model, Madhya Pradesh	Khunti Model, Jharkhand	Deepak Foundation, Gujarat	Mrityunjoy 108, Assam	1298, Kerala
Scale of operation	District-level	Multi-blocks	Multi-blocks	State	Multi-districts
Operating in security-affected areas		✓		✓	
Charges a user fee		✓	✓		✓
Subsidised by government through NRHM funds	✓		✓	✓	
Supported by donor agency	✓	✓			
ALS * ambulances, BLS ambulances or vehicles only**	Vehicles only	Vehicles only	BLS	ALS	ALS and BLS

*Advanced life support, **Basic life support

Figure 2.4: Five models selected for review



Guidelines
for Establishing a Perinatal Referral Transport Service in Rural Areas

3.1 Components of a Perinatal RT Service

The aim of establishing a perinatal RT service is to ensure that a woman facing obstetric complications reaches an adequately resourced facility safely, in sufficient time, and in a condition that provides a fair chance for survival for her and her baby.

The key components of an effective RT service are as follows:

1. **Detection**
2. **Reporting**
3. **Response**
4. **Care during transfer**
5. **Transfer to definitive care**
6. **Feedback**

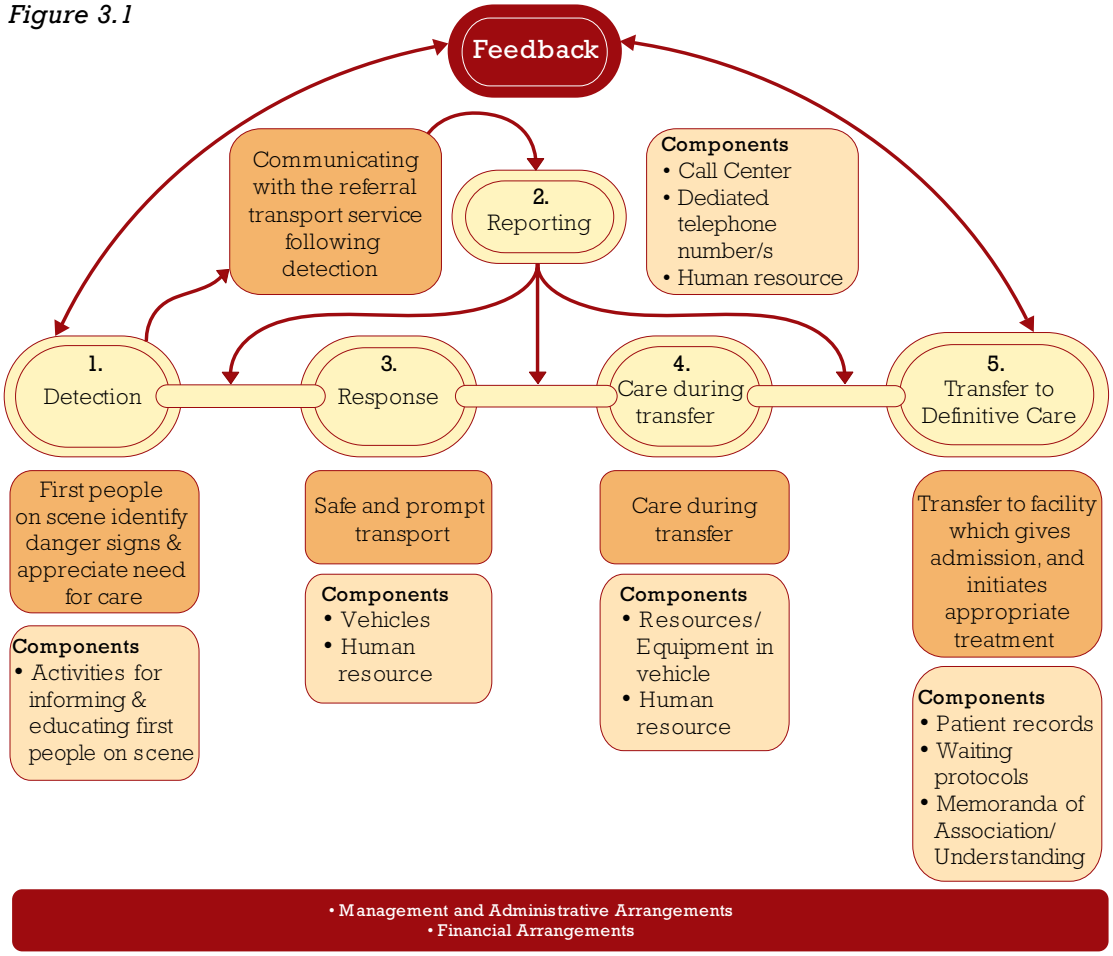
The following section details each of these components and lays down minimum and desirable characteristics or standards for them.

3.2 Detection: Understanding When to Contact RT Services

In order to seek RT for obstetric cases, family members and community health workers need to detect the danger signs and appreciate the need for seeking care. An effectively functioning referral service would inform and educate communities on the need for seeking institutional care, on recognizing danger signs, and on preparing for an institutional birth.

To achieve this, it is essential that community health workers support the families on birth preparedness and prepare birth plans for each pregnant woman. A sample of a birth plan and counselling aide for birth preparedness is provided at Annex B.

Figure 3.1



In regions where there is civil unrest or regions which are security-affected, it is also critical to engage community leaders from the outset, to gain access and trust of the communities.[2] In these contexts, by getting involved in ''detection,'' the RT service also stands a greater chance of being accepted by the communities.

Box 3.1: Involving communities

An effectively functioning RT service seeking to promote safe motherhood should play an active role in building community capacity to ''detect'', by communicating with community health workers and other key community stakeholders to:

- Inform and educate communities on the need for seeking skilled attendance at birth.
- Support families to prepare for safe child birth.
- Assist families in preparing a birth plan.
- Educate families on recognizing danger signs.
- Make families aware of and utilize RT services, particularly ''when to ring''.
- Making families aware of options open to them for transport to institution in case of emergency.

[2] This was successfully demonstrated in the model operated by Karra Society for Rural Action (KSRA) in Khunti district of Jharkhand.

In Table 3.1, a summary of key actions is given that an RT agency should engage in to promote its services "detection". All actions should be sensitive to prevailing socio-cultural norms on pregnancy and childbirth in the target communities.

Table 3.1: Key actions and audiences for promoting detection

	Audience	Direct activities that an RT agency can undertake	Support that an RT agency can provide

1.	**Actors**
	• ASHAs
	• Auxiliary Nurse Midwife (ANM)
	• Anganwadi Worker (AWW)
		• Initial face-to-face meeting to establish community point of contact
		• Follow-up communication in person/over phone
			• Capacity building related to:
			  ○ Timely registration
			  ○ Counselling for birth-preparedness
			  ○ Supporting birth planning

2.	**Intermediaries** • PRI representatives, community leaders and local political leaders • Drivers of referral vehicles • Driver associations	• Initial face-to-face meeting to establish community point of contact • Sessions with Self Help Groups (SHGs)	• Connecting drivers (if local) to community health workers so that they are aware of monthly Expected Delivery Dates (EDD) in the village
3.	**Ultimate Target Group** • Families • Pregnant women	• Prominent and permanent display of contact numbers of RT services • Demonstrations of vehicles in villages to familiarize communities with the vehicles and drivers • Use of folk media to raise awareness on danger signs and need to seek timely care	• Public Service Announcements/ Adverts on local TV station(s) • Link-ups with mobile phone companies for free SMS

The RT services should communicate the danger signs and the need to seek care immediately on appearance of these danger signs:

Box 3.2: Guidelines on when to seek care/referral care immediately

- Bleeding during pregnancy
- Excessive bleeding during delivery or after delivery
- Preterm labour
- Headache, blurring of vision
- Convulsions/fits
- Swelling over body, hands and face
- Prolonged labour
- Bursting of water bags without labour pains
- Absence of foetal movements
- High fever during pregnancy or after delivery
- Severe anaemia

3.3 Reporting: Communicating with the RT Service Following Detection

The second important component of an RT service is a structure that enables families and communities to contact the service provider; and for the provider to respond to their requests. This component of the RT service is referred to as "Reporting". Effective reporting requires **an effective and reliable communication system, managed by trained staff** that are able to receive, triage, and dispatch the vehicles.

3.3.1 Reporting: Call Centre

A central call centre is essential to coordinate receipt of emergency calls, dispatch vehicles, maintain adequate records of the calls, and follow up. The level of sophistication of technology currently used in call centres in India varies widely, and would dictate the financial resources required in setting up and managing the call centre. Minimum characteristics of an effective call centre – including desirable characteristics, resources permitting – are outlined in Table 3.2.

Table 3.2: Minimum and desirable characteristics of a call centre

		Minimum	**Desirable** (in addition to minimum)
1.	**Space and location**	• Dedicated room/office as call centre/ control room • Located at a place where there is good mobile phone connectivity, that is secure and easily accessible. Being located within government health premises may be helpful for better coordination with facility staff	
2.	**Fittings and furniture**	• Computer and UPS • Internet connection • Small generator/converter • Fan • Computer table and chair • Map of area that shows roads and *operational* health facilities • Display board/White board to monitor daily calls	• Printer • Fax • A/C • GPS system
3.	**Telephone connection**	• Preferably two separate connections, including a landline with PBAX (switchboard) system and a mobile phone connection (with best coverage in villages/most popular service provider in village). Service providers should be different, in case one becomes out of service. • Mobile phone/connection • Closed User Group (CUG) mobile connection for staff may help reduce costs	• Toll-free number

4.	**Telephone number**	• Seek numbers that are more easily remembered (sequenced digits or repetition of digits) • The caller should be put on hold/queue if line is busy	• 3-digit emergency number)
5.	**Call recording software**	• A simple software capable of recording details of calls received, and vehicle/ driver details and generating reports on this data. (simple spreadsheet application can be used.)	• Software that sends automated SMS messages to mobiles (eg. the system used by EMRI or 1298) giving contact details of patient • Voice logging software
6.	**Other methods for triaging, and suggesting essential action**	• Simple triaging checklist (see Box 3.3)	• Software or information that can be used by the Call Operator to provide basic emergency first aid [3] • MediConnect server for distant monitoring [4]

3.3.2 Reporting: Human resource requirements

To manage the reporting function, the call centre operators should be able to receive the calls 24x7, screen the calls, and initiate appropriate action. See Table 3.3 for guidance on minimum requirements for Call Operators, including desirable characteristics that may be considered if resources permit.

Table 3.3: Minimum and desirable characteristics of a call centre operator

	Characteristics	Minimum requirements	**Desirable requirements** (in addition to minimum)
1.	**Number**	• One dedicated Call Operator available 24x7, preferably one per 8-hr shift	• Two Call Operators per team, namely one Call Taker who receives the call from the patient/ informant and one Call Dispatcher who arranges for the vehicle to be dispatched. This should result in faster dispatch and reduced waiting time for the next caller
2.	**Personal attributes**	• Multiple local-language skills • Good listening skills • Quick decision-maker • Computer literate • Fast in retrieving and documenting data • Can follow protocols • Polite and sympathetic nature	
3.	**Qualifications**	• 10th standard pass • Basic computer literacy (MS word, MS Excel)	• Graduate

[3] For example the ProQA E.M.D. software that is used by 1298 that consists of an online software and hard copy flip up book listing ailments in alphabetical order, along with main symptoms and first aid measures that can be administered.
[4] MediConnect process will connect the ASHA with facilities for monitoring of patients. ASHA will fill out the patient questionnaire and based on this, doctors at high level facilities will classify patient as high or low risk. High risk patients will be visited by mobile teams and transferred if needed. Women with moderate risks will be monitered through SMS's sent out by the sever and with support from the ASHA

	Characteristics	Minimum requirements	**Desirable requirements** (in addition to Minimum)
4.	**Responsibilities**	• Receiving calls • Identifying appropriate action • Dispatching vehicles • Liaising with health facilities in advance to prepare them for receiving patient, and ensuring bed availability • Closing calls • Following up on patients to record outcome • Record keeping	• Suggesting actions for initial stabilization

3.3.3 Minimum and desirable standards for call taking and protocols for call dispatch

After a family has called up the RT agency, further course is dependent on how the calls are received and acted upon. See Table 3.4 for guidance on the minimum information required to be collected and provided during a call *and* the facility to which the patient will be transported, plus additional standards that are desirable if the resources permit:

Table 3.4: Minimum and desirable standards for call taking

		Minimum	**Desirable** (in addition to minimum)
1.	**Answering call**	• Deal with all calls within 120 seconds	• Pick up call within 3 rings
2.	**Information to be taken from caller**	• Location of patient • Contact telephone number • Patient details – name, age • Purpose for which vehicle required • Condition of the patient (see Box 3.3) • Nearest health facilities (collected as a reference point rather than to definitely decide on where to take patient) • Agreed pick-up point (house, other location)	
3.	**Information to be given to caller**	• Estimation of time taken to reach patient. *(Call Operator must inform caller/family how long vehicle will take. If reaching time is going to be longer than usual, caller must be requested to inform Call Operator on whether they will wait for the vehicle or make other arrangements*.)* • Description of vehicle and name of driver dispatched • Phone number of driver	
4.	**Information to be given to facility**	• Basic problem and condition of patient • Estimated time of arrival	
5.	**Information to be taken from facility**	• Availability of beds and appropriate doctors • Blood availability	

** A protocol or Plan B for vehicle unavailability must be established, so that patient is not left waiting for a vehicle.*

Box 3.3: Checklist for assessing condition of the woman

The Call Operator should quickly identify the condition of the patient, and decide on where to refer; those with apparent complications should be prioritized and referred to the appropriate level:

- Is the woman conscious or unconscious?
- Is the woman having convulsions?
- Is the woman pregnant? How many months of pregnancy?
- Is she in labour (vaginal leaking/intermittent sustained pains)?
- Any bleeding per vaginum? (Any bleeding during antenatal or excessive bleeding in the postnatal period is dangerous. Refer to a well-equipped facility).
- Was the previous delivery by caesarean?

3.4 Response: Safe and Prompt Transport

After receiving a call, an RT service should aim at ensuring safe and prompt transport of the woman from home to an appropriate health facility, or from one level of a health facility to a higher level. Safe and prompt transfer depends on the following factors:

- **Number and location:** An adequate number of vehicles placed at strategic locations which are well connected with the villages and facilities, so as to provide timely transport.
- **Vehicle quality:** A vehicle should be of adequate quality that enables it to negotiate the specific terrain in which it has to operate, and has reasonable maintenance costs.
- **Driver skills:** Ability of driver to navigate the vehicle safely in different types of terrain, variable weather conditions, and in various socio-political contexts (e.g. security-affected areas).
- **Care during transfer:** Care will be dependent on the availability and skills of the escort(s), availability of appropriate equipment and supplies, and availability of standard protocols for care during transport. This will be covered in Section 3.5.
- **Transport to an appropriate facility:** An appropriate facility is one that is able to deal with the condition for which a woman is transported. This will be covered in Section 3.6.

3.4.1 Response: Number and location of vehicles

The primary objective of any RT service is to deliver the patient to an appropriate facility as quickly and safely as possible. Safe and prompt transfer first depends upon having sufficient vehicles placed at sufficient and strategic locations. Deriving the numbers and locations of vehicles required will depend upon the following variables:

- Geographical spread of villages
- Availability of emergency obstetric care facilities.

Bear in mind the fact that a woman with obstetric complications, especially one with postpartum haemorrhage, should be able to access emergency obstetric care within two hours. A mapping of the health facilities and actual services provided, as well as mapping of areas with difficult access may be necessary in order to place the vehicles at the most strategic locations. See information on situation analysis at Chapter 5.1.

3.4.2 Response: Vehicle quality

The vehicles engaged for RT services should be able to negotiate the terrain and extreme weather conditions; and should be designed in a manner that allows comfortable transport of patients and installation of the required equipment. See Table 3.5 for minimum and desirable standards for vehicles engaged in RT services. Requirement of medical equipment and consumables for care of patients is dealt in Section 3.5.

Table 3.5: Minimum and desirable specifications for vehicles

		Minimum	**Desirable** (in addition to minimum)
1.	**Type of vehicle**	• Vehicles dedicated for use as RT ambulances [5] • Built as a multi-utility vehicle • Has easy-access doors • Has a valid certificate of road-worthiness • Is in a good state of maintenance • Has sufficient inside space for the patient to lie comfortably, and for escort/attendant to comfortably attend to patient in emergency	• 4-wheel drive (this should be a Minimum standard in hilly and difficult-to-access terrains) • Vehicle fleet should include at least some vehicles that have a higher ground clearance that are: ○ Capable of navigating uneven, narrow mud roads ○ Capable of navigating steep inclines ○ Capable of operating during monsoon conditions ○ Easy for staff/driver to get in and out
2.	**Legal issues**	• Each vehicle is properly insured • Each vehicle is legally registered to be used as an ambulance, where legislation prescribes registration	
3.	**Furniture and internal fittings**	• Stretcher bed for a woman to comfortably lie down • Hooks to hang intravenous infusion fluids • Bench or chair for two people to sit, preferably foldable for better space utility • Has washable flooring and walls. Should not contain cloth or materials that can get soiled (eg. curtains) • Map of area that shows roads and operational health facilities	• A portable stretcher with rollers that can be used to transport the patient into the hospital • Air conditioning unit
4.	**Equipment**	• Mobile phone for driver • Toolbox for basic vehicle maintenance and repair • Spare tyre • Fire extinguisher • Basic cleaning materials (disinfectant, mop, cloth)	• GPS tracking system

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[5] Vehicles dedicated for use as referral transport ambulances is put as Minimum. However, this does not negate use of non-dedicated vehicles (eg. in Khunti model, Jharkhand) where a service has been evolved to work within the particular context of security-affected villages in the district.

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		Minimum	**Desirable** (in addition to minimum)
5.	**External fittings/ appearance**	• Markings that make it easily recognisable as an ambulance service (and not a hearse service[6])	• Emergency lights • Siren or hooter • Uniform colour/markings for fleet
6.	**Maintenance of vehicle - interior**	• Vehicle interior inspected and cleaned after every dispatch • Sheets are changed regularly • If used for other purposes, vehicle to be cleaned properly before (and after) use as referral vehicle[7]	Should not be used for other purposes, but be on 24 hours standby as ambulance Regular maintenance of vehicle, engine (as per set standards)

3.4.3 Response: Quality of the drivers

The minimum and desirable standards for drivers engaged to drive RT vehicles are indicated in Table 3.6:

Table 3.6: Minimum and desirable standards for drivers

		Minimum	**Desirable** (in addition to minimum)
1.	**Number**	• One per 8-hr shift: 3 drivers per vehicle per 24-hr service • One driver ''on call'', should the other driver be unavailable	• Accompanying person required for security-threatened areas
2.	**Personal attributes**	• Fit to drive a vehicle (see box on ''Person unfit to drive a vehicle'') • Local resident, comfortable working in the villages to be serviced • Literate • Has valid license. If driving an ALS ambulance, has a valid Heavy Motor Vehicle (HMV) license • Complies with Government of India child labour laws • No alcohol/drug problem • Good communication skills • Professional approach – (a) calm disposition that is not easily drawn into arguments (b) body language that imparts sympathy and understanding (c) helpful nature	• Multiple local language skills • Uniform
3.	**Qualifications**	• 3 years of experience of driving – including driving in hilly and remote areas, on mud roads, and in monsoon conditions	• 10th grade cleared • 5-10 years of driving experience • Has undergone a basic road safety training course

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[6] 1298 Kerala had to compete with the pre-conception in Kerala that white ambulances typically doubled-up as hearses. People therefore were not willing to use the same vehicles for emergency purposes. For this reason, 1298 painted their ambulances yellow and green, to distinguish them from the regular hearse-cum-ambulances.
[7] Guidelines for vehicle disinfection and other hygiene practices in pre-hospital care are available. For example, EMRI has documented ''Ambulance Guidelines'' for reducing infection through effective practice in the EMRI pre-hospital environment.

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		Minimum	**Desirable** (in addition to minimum)
4.	**Knowledge & skills***	• Road safety and traffic rules • Basic vehicle maintenance • Can drive multiple vehicle types • Can use communication equipment • Can use basic medical equipment in the ambulance • Basic record-keeping and financial management ability	• Basic First Aid, including recognition of symptoms of obstetric emergencies and necessary responses
5.	**Responsibilities**	• Maintaining road-worthiness of vehicle • Maintaining furniture and fittings in good working order • Maintaining external appearance of vehicle • Maintaining cleanliness of vehicle • Support in transporting the patient to the ambulance	• Support the EMT/escort in emergency management, if required
** Some skills may need to be imported as induction training*			

Box 3.4: Person deemed "unfit" to drive a vehicle

- Defects of vision which cannot be corrected by spectacles.
- Colour or night blindness.
- Hearing defects which cannot be corrected with help of a hearing aid.
- Epilepsy.
- Sudden attacks of loss of consciousness or giddiness.
- Physical deformity that affects driving.
- Suffers from any other disease or disability that is likely to cause danger to other road users while driving.

Adapted from http://www.transportindia.in/lic_unfitness_to_drive_vehicle.asp

3.5 Care During Transfer

3.5.1 Escort for care during transfer

An RT service for obstetric care should have a skilled person (subsequently referred to as an Escort) who can provide the basic care during transit, and appropriate equipment and supplies to enable him/her to do so. The Escort should preferably be a skilled birth attendant (SBA), e.g. ANM or a staff nurse. The Escort should be able to:

- Provide skilled care for mother and newborn during transit.
- Take a decision to change the destination facility during transit, based on changes in the mother and/or baby's condition.
- Use the equipments available in the vehicle.

Box 3.5: Why an Escort is required

Delay in initiation of appropriate treatment can be fatal for many obstetric complications. Stabilising a woman with obstetric complications during transit can be life-saving, e.g. in post-partum haemorrhage (PPH). A skilled birth attendant (SBA) such as an auxiliary nurse midwife (ANM) or a general nurse midwife can provide obstetric first-aid for the complications, e.g. injectable Magnesium sulphate for eclampsia and injection Oxytocin for PPH. It is therefore recommended that an SBA should escort the women with obstetric emergencies during transit.

See Table 3.7 for minimum standards for an Escort for RT services, and additional standards that are desirable should the resources permit.

Table 3.7: Minimum and desirable characteristics for Escort for referral transport services

		Minimum	**Desirable** (in addition to minimum)
1.	**Numer**	• One Escort per transfer/case	
2.	**Qualifications**	• Skilled birth attendant (eg. ANM, LHVs, staff nurses)	• Skilled birth attendant with EMT training
3.	**Knowledge and Skills (some of this will be provided as part of induction training)**	• Basic anatomy, physiology of the reproductive system • Can recognise and conduct normal deliveries • Can recognise and manage complications as per standard protocols • Can use the equipment available in the ambulance	
4.	**Responsible for**	• Care of mother and newborn during transit • Recognising complications and taking decision to change destination facility, if higher facility required • Providing emotional support to women and her family during transport • Supporting admission of the woman and initiation of treatment upon reaching the facility	• Provision of advanced pre-hospital treatment and care on obstetric emergencies

Guidelines for care during transport have been developed by the Regional Perinatal Outreach Program of Southwestern Ontario and the Southwestern Ontario Perinatal Partnership in Canada, and can be used as a reference for developing guidelines consistent with Indian guidelines on skilled birth attendance. (http://www.sjhc.london.on.ca/sjh/profess/periout/chapters/40_maternal_fetal_transport_revised_aug_08.pdf)

3.5.2 Equipment and supplies for care during transport

See Annex C for a list of essential equipment and supplies that should be available in the vehicle engaged to provide RT services. In addition, it specifies the additional equipments and supplies that are desirable, should resources permit.

3.6 Transfer to definitive care

The final task or component in an RT service is ''transferring the woman to a definitive care'' where the transport providers help in ensuring that the **woman is taken to an appropriate facility and admitted to the facility, *and* that appropriate care is initiated.**

Box 3.6: Inter-facility transfer or "second referral"

Key considerations in transferring the woman to the definitive care are presence of an obstetric complication, and the availability of facilities adequately equipped to manage that complication. For example, if the woman has excessive vaginal bleeding that is not controlled by care during transit, she would need to be transported to a facility that has a blood bank or blood storage facility. In some instances, the first-level facility where the woman is transported may not be able to provide the required care and may recommend transfer to another higher level facility. In such instances, the transport service should provide ''second referral'' or inter-facility transfer services.

For inter-state border districts, second referral sometimes means transporting the woman to a facility in a neighbouring state. In such cases, there are additional considerations such as admission of the patient from another state, reimbursement of the JSY scheme funds, safe transfer across borders, and similar administrative issues.

3.6.1 Who decides on the "appropriate facility"?

Different RT services operating in rural India have different policies on how the decision on where to transport the woman with obstetric emergency is made. The norms finally selected should be drawn depending upon the numbers, and quality of and access to health facilities in the area. See Table 3.8 for the advantages and disadvantages of these different policies, which could guide you in taking an informed decision on which policy to adopt in a given context.

Table 3.8: Pros and cons of different approaches for deciding where to transport the woman with obstetric emergency

Policy	Pros	Cons
Prescriptive: Patient taken to nearest PHC/ CHC	• Should help in strengthening the government facility referral chain • Should be easier to link RT services with subsidies available under JSY	• PHC might not be equipped to deal with obstetric/emergency obstetric cases and patient suffers or more time/resources have to be spent on further referrals • Could leave room for potential abuse of the service
Prescriptive: Patient taken to nearest well-equipped (and lowest cost) facility	• Patient is taken to a facility equipped to deal with obstetric cases = greater chance of life saved	• Doesn't directly lead to strengthening of government facility referral chain – may lead to overloading of higher facilities (eg. civil hospital) • May involve a cost for the patient to use the facility • Harder to link RT with JSY subsidies

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Policy	Pros	Cons
Flexible: Patient's choice of facility	• May promote more confidence and usage of the service	• Doesn't directly lead to strengthening of government facility referral chain – may lead to overloading of higher facilities (eg. civil hospital) • Could leave room for potential disagreement between patient and RT management agency • More difficult for management agency to manage relationships with facilities to ensure care and treatment • Harder to link RT with JSY subsidies

The decision on where a woman is taken may vary according to local or state-specific circumstances. For example, in states where there is high awareness regarding the need for institutional delivery and where there are functional facilities, the choice of location can be left with the patient. **A basic guiding principle is that the patient should be taken to the nearest appropriate facility, appropriateness determined by the services available at the facility that are sufficient to deal with the then condition of the patient.**

To facilitate this, a chart with probable type of condition/signs/symptoms together with name of facility where to refer the said conditions should be prepared for each district. The GOI SBA guidelines can be useful for this exercise. The chart should be available in the call centre, ambulance, and with the functionaries of the RT service.

3.6.2 Role of RT services in initiating care

An effective RT service should ensure that appropriate care is initiated at the health facility. The minimum and desirable activities that an RT service provider (escort or driver) should undertake to support the woman and her family in initial negotiations with the health facility, are outlines at Table 3.9. Preferably the escort or driver of the RT service should act as the ''advocate'' for the patient at the facility.

Table 3.9 : Minimum and desirable functions that an RT service provider should conduct to support families in negotiating with the health facility

		Minimum	**Desirable** (in addition to minimum)
1.	**Role of RT service provider**	• Ensure that a formalised handover of patient happens, via a register or patient record that is filled out by the escort or driver of the referral vehicle and signed by the pertinent person at the facility (doctor, nurse, head of administration)	• A standard referral format (recognized by all facilities) that is filled out in the village and /or health facility. The form follows the patient and has information on tentative diagnosis/symptoms and treatment given. See Annex E for an example from a PHC
		• Waiting for a fixed period of time (eg. 30 min) at place of first referral, to see whether further referral is required. **If required, to take the patient to place of second referral**	• Have in place a Memorandum of Understanding with the facility (as further detailed in Section 5.2) that clearly sets out the roles and responsibilities of each party

Notes on Setting Up and Managing Referral Transport Services in Special Circumstances

Operating RT services in some areas will require special considerations. In this section, two special circumstances are covered: 1) areas where there is threat to physical security (subsequently referred to as security-affected areas), and 2) areas with hilly or difficult terrains (subsequently referred to as hilly terrain areas). The following section is based on insights from models operating in such areas.

4.1 Special Considerations for Security-affected Areas

The following must be considered while planning for an RT service in security affected areas:

- **Generating demand and raising community awareness for acceptance** of the RT service is critical, otherwise a community may be unwilling to let an RT vehicle ply safely. Buy-in from community leaders and power holders is essential. Working with local non-government organisations (NGOs) and community-based organisations (CBOs) may help this process.
- **"Referral Transport Out"** rather than "Referral Transport In" should probably be the principle, that is using local vehicle providers from within the communities who are known rather than people coming from outside. A mapping of all private vehicle owners in the area will be required. Local community members who can be trained as drivers could be an option.
- **Knowing the area adequately** – identifying and mapping of the area – is advised. It is important to fully understand the socio-political situation, identifying hotspots or seemingly "no-go" areas.

- Working with or through **CBOs** may be advisable, such as through SHGs, with the support of key community figures – ASHAs, rural medical practitioners, and village leaders.
- If entering a sensitive village/area is not feasible, establishing a **set of agreed pick-up locations** for obstetric emergency cases and sharing this information with the community, will be required.
- **Incentivising organisations/drivers** to operate a service in such areas may be required.
- **The cultural and social value** of the target population should be recognised and respected.
- Connectivity of telephones may be an issue in security-affected areas. **Diversifying the communication system**, for example through the inclusion of multiple phone service providers, may be required.

4.2 Special Considerations for Hilly-terrain Areas

The following considerations should be kept in mind while planning services in hilly-terrain areas:

- **Reaching the last mile** is often an issue in hilly areas. In some villages and at some times of the year, vehicles are not able to reach the patient's house and, therefore, the patient needs to be brought to a point connected with a motorable road. Local solutions should be identified to reach the last mile, for example hill stretchers promoted in Nepal under the Government of Nepal/DFID sponsored Safer Motherhood programme.

- Vehicle fleet should include **vehicles with four-wheel drive** to enable drivers to negotiate steep terrain. Higher maintenance costs should be budgeted for such vehicles since wear and tear is higher in these areas

.

- **Escorts should have high level of skills in obstetric care**, since travel time can be longer and their skills will come handy during transit.

- In hilly areas, the promoters and operators of the RT services should **work with government and local *panchayats*** to ensure that funds available for road improvement are utilised, and to understand fully how time can be minimised in reaching the meeting point.

- **Stronger backward (with communities) and forward (with health facilities) linkages** required: Maternity huts should be considered for hilly terrain areas where women could come before the expected date of delivery, so that they are able to reach the facility in time should a complication arise.

Management Arrangements

5.1 Contractual Arrangements

A set of management arrangements needs to be put in place for RT service components described in Section 3 to function effectively. Management arrangements would normally include the following:

- Contractual
- Staffing and human resource
- Procurement and equipment maintenance
- Financial information

Contractual arrangements required for RT services include:

Contract with a community-based organisation (CBO): In this case, the District Health Society (DHS) or an external donor enters into a contract with a CBO that sets up a call centre, liaises with the local vehicle owners, and mobilizes the community. Such a contract is helpful in difficult terrain and security affected areas.

Contract with a professional RT provider: In this case, the state (or a district) enters into a contract with a professional referral transport service provider that sets up and manages the call centre, provides and manages the fleet of ambulances, recruits and places the staff. All the functions of referral transport are outsourced to the agency.

Contract with vehicle owners: In this case, DHS is responsible for managing the RT services (setting up and managing the call-centres, providing ambulances, and monitoring and reporting). DHS in turn enters into a contract with private vehicle owners (individual or group) to enlarge its fleet of vehicles.

5.1.1 Contracting an RT service provider

Whether the contract is with a CBO or with a professional RT service provider, it should include the details as given in Box 5.1.

Box 5.1: MoU with an obstetric RT service provider

- **Operational details:** population/geographic coverage; number of vehicles to be provided per block; location of the call centre; phone number details.
- **Financial details:** user fee details (including arrangements for the poorest)
- **Vehicle details:** equipment, medicines and resources; staffing.
- **Vehicle and equipment maintenance and repair details**
- **Training details**
- **Management details:** staffing; MIS (records and reports required)
- **Terms of payment**
- **Agreed budget:** expected expenditure per item; sharing of expenditure (if it is a public private partnership).

Box 5.2: Contract with transport provider

- **Expected performance:** Coverage, shift duration, expected number of callouts per day/month, protocols on time taken to reach patient and to transport patient to facility, and protocols on inter-institutional transfer.
- **Personnel requirements:** Minimum staffing requirements, staff attitude and behaviour.
- **Vehicle checks:** Maintenance of vehicles (interior and exterior), record keeping system, cancelled calls, shift change procedure.
- **Etiquette:** En route to scene, at the scene, en route to the hospital, arriving at the hospital, en route back to station, arriving back in station, after the call.
- **Financial arrangements:** Payment norms, terms and conditions.

5.1.2 Contracting vehicle owners and drivers

A contract with an individual or group vehicle owner or driver should include the following details as given in Box 5.2.

5.1.3 Memoranda of Association of RT service provider with facilities

Whether the service provider is a professional RT service provider or a CBO, a Memoranda of Association (MoA) may be required with key health facilities, so as to ensure that transported patients are well received and well managed; and that roles and responsibilities of the two parties are clear. This MoA could be with public as well as private facilities, depending on the availability in the service area.

5.2 Staffing

Operating an RT service will require sufficient human resources for management and administrative back-up. The scale of operations and available resources will determine the number of staff that can be employed for these purposes. However, at a minimum, one full-time coordinator and one part-time accountant are required for each unit of operation (usually a district) where the RT services operate.

5.3 Procurement and Equipment Maintenance - Vehicle Maintenance

Vehicle maintenance is a critical part of vehicle quality and cannot be under-valued. Any disruption in a referral service owing to poor vehicle maintenance can be fatal. An RT service contractor should therefore think innovatively on how best to ensure proper maintenance and upkeep of vehicles in the fleet, particularly in remote and interior locations. Suggested measures include:

- **Initial inspection:** An initial inspection of all vehicles that are proposed to be a part of the fleet may be carried out to ensure their road-worthiness. Only those vehicles that are found to be road-worthy are allowed to join the fleet.
- **Independent mechanism to monitor road-worthiness:** As part of a contract with an RT management agency, prescribe that an independent mechanism be established to monitor and undertake maintenance of vehicles. For example, a contractor can stipulate that funds are set aside to contract mechanics and/or local garages to inspect vehicles on a monthly basis and provide a verification/certificate of road-worthiness for each. Or else, the maintenance arrangements can be left up to the contractee, with the contractor maintaining an independent monitoring mechanism.
- **Incentivise:** Private vehicle providers can be incentivised to maintain their vehicles regularly by making part of their payment conditional on passing a periodic vehicle inspection.
- **Special arrangements for locations where there are no mechanics or workshops:** in such cases, contracts given to a management agency for RT must prescribe that a full-time mechanic be a permanent member of the agency staff.

5.4 Financial Management

5.4.1 Preparing a budget for setting up and managing an obstetric RT service

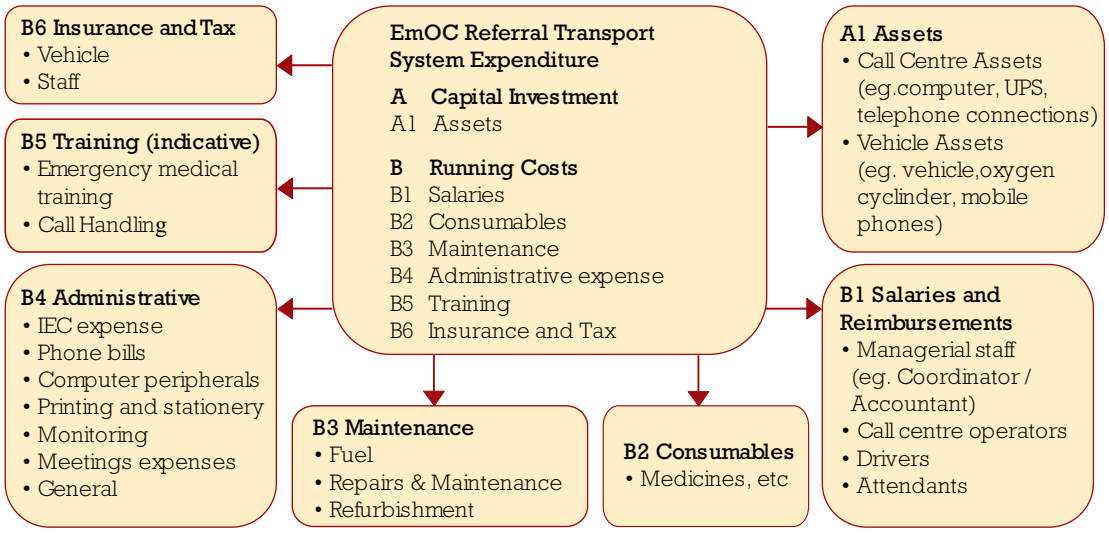
The expenditure heads that typically make up a budget for setting up and managing an RT service is depicted in Figure 5.1. They include both capital investment and running cost heads. When combined with the list of minimum and desirable standards presented in the earlier section, these heads will help in the preparation and appraisal of the necessary budget. When forecasting the budget, depreciation of equipment and vehicles should be taken into consideration.

5.4.2 Generating revenue

Funding could be secured from the following sources:

1. **Leveraging existing government resources:**
   - Roadworthy vehicles (from health department and other departments) – important since vehicle purchase is a significant cost component.
   - Vehicle maintenance arrangements.
   - Space, furniture and fittings (for the call centre).
   - People (as drivers, call centre operators, management).

Figure 5.1: Indicative expenditure heads for setting up and managing a referral transport service



- Funds (for example NRHM funds, JSY funds, ICDS funds, *Rogi Kalyan Samiti* funds, funds lying with the Village Health and Sanitation Committees and other funds that may be available in certain states). JSY funds are being utilised to pay drivers' salaries – in the Guna model of Madhya Pradesh) as described in Box 5.3.

2. **Leveraging other existing emergency vehicle resources:**
   - As noted by the Deepak Foundation in Gujarat, Vadodara district alone has 140 emergency vehicles (operational under EMRI's 108 and Deepak Foundation's EmTF, at government PHCs, CHCs, and others). Yet, these vehicles are not being managed to provide a coordinated emergency transport service. Some vehicles remain under-utilised and under-maintained, and may become wasted resources. Deepak Foundation has suggested contracting out the management of all emergency vehicles in a district to an independent organisation with technical capacity in transport/fleet management and operations management.

   - Similarly, in some districts there will be existing ambulance service providers. Bringing them into a networked service may be feasible. For example, Dial 1298 for Ambulance has networked service providers (typically individual ambulance owners, or hospitals with ambulance facilities) in Kerala through an MOA.

3. **Leveraging corporate and other donations:**
   - Donations of vehicles and equipment from corporates as part of their corporate social responsibility (CSR) activities. For example, Dial 1298 in Kerala has secured donations of four or five ALS ambulances for ₹ 18.5 lakh each (including equipment) from various corporate houses. Many corporates in India have public health as a key pillar of their CSR strategy. They may welcome the idea of funding a vehicle or medical equipment, which can provide high visibility for their CSR activities in return. The RT service provider will need to find funding to cover operation and maintenance of donated vehicles.

   - Seeking funding from international NGOs, charitable foundations, and other organisations such as Rotary or Lions Club with a remit to fund health sector initiatives in India.

4. **User fees**
   - Many of the RT services in India are charging a fee from the users – most commonly the fee is paid per kilometer of travel involved. Some charge a higher fee at night.

   - If a user fee is needed for the RT service to function, it is essential to keep in mind target populations' ability and willingness to pay for the service. A survey can be done as part of the situation analysis when establishing the services.

   - It is important that the RT service is able to cater to the most vulnerable population, hence other sources of revenue should be considered before establishing a user fee. However, if a user fee is established, a waiver system for the most poor should be created. The waiver system – e.g. BPL families are exempted to pay – should be monitored closely for compliance.

5. **Selling advertising space**
   - One example is selling advertising space on the sides of the RT vehicles (as Dial 1298 has successfully done in Mumbai with Tata AIG Insurance).

     An example from Guna district of Madhya Pradesh where funding is sourced from a mix of public schemes, is provided at Box 5.3:

Box 5.3: Using existing funding from public schemes for RT

The Guna model of referral transport for maternity cases, operating at the district level, was established at a cost of ₹ 3-4 lakh. The monthly operating cost for the call centre is ₹15,000, now met from NRHM funds. The salary cost of the drivers is met from the ₹ 250 provided for transportation under the JSY scheme, diverted straight to the management agency. Any additional costs are met from administrative budgets available under JSY or from the *Rogi Kalyan Samitis*' funds. The District Collector in Guna was able to mobilise four vehicles from private donors, including the Gas Authority of India Limited, and one from a Member of Parliament.

5.5 Information Management

A number of records and reports relating to the performance of the RT service need to be maintained. This will enable understanding whether the service is operating efficiently and effectively and in making corrections. A number of parameters for data analysis should be established at the outset of the service establishment. These parameters should relate to operations and to output/impact, as set out below. Periodic reports should then be generated.

5.5.1 Reports

Performance

The parameters listed in Box 5.4 should be reported for assessing performance of the RT service:

Box 5.4: Performance indicators for an efficent RT service

Service performance

- Average number of calls attended per day
- Average number of cases transported per day
- Average number of maternity cases transported per day
- % calls received versus attended
- % calls dispatched versus attended
- Average time taken to reach the site
- Average time taken to reach the facility
- Number of women transported – by social class

Vehicle performance

- Average number of kilometers per run
- Average cost per run

Outcomes

The indicators as listed in Box 5.5 should be reported for assessing outcomes of the RT service. The RT service provider must work in cooperation with local health facilities to obtain this data.

Box 5.5: Outcomes

- % women with complications presenting to the health facilities
- Average duration of stay at facility
- % women with assisted deliveries
- % women that underwent caesarean section
- Met needs for (emergency) obstetric care
- Still-birth rates at the health facilities
- Perinatal mortality rate at the health facilities
- Maternal deaths up to 42 days
- % institutional deliveries

Financial status

The information as given in Box 5.6 should be reported on financial status:

Box 5.6: Financial status

- Revenue generated, by source
- Expenditure incurred (by expenditure head)
- Unit cost per case transported
- Unit revenue generated per case transported

5.5.2 Records and registers

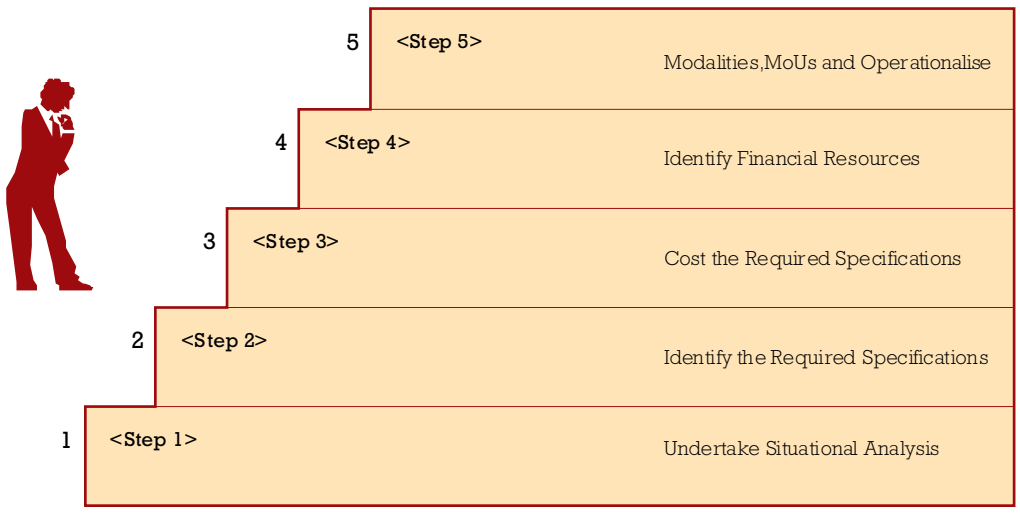
A number of information must be recorded on performance against parameters. In addition, some records will need to be maintained to ensure financial transparency. The list of records that should be maintained by the RT service provider is given at Table 5.1.

Table 5.1 Records to be maintained	
	Details
Per patient	
• **Pre-hospital care record (PCR)**	Detailed case record (including caste of the family) – eg, PCR record format used by EMRI
• **Post-delivery status report (ascertained telephonically)**	• Details of delivery (normal, assisted, CS) • Complications, outcomes (stillbirth, live birth, neonatal death, maternal death) • Expenses incurred by the patient
At call centre	
• **Daily call tracking**	• Date, time of call, location, patient condition, vehicle details • No. of calls received vs. No. of calls dispatched per location • Time taken to reach the site • Time taken to reach definitive car facility
Per vehicle	
• **Receipt book**	• Provide receipts to all patients (whether paid for or free)
• **Log book/Register**	• Details of each call out/journey (eg. number of call outs per day, locations to/from, kilometres covered per day (opening and closing km per call), provisional diagnosis of patient, drugs administered, consumables used)
• **Account statement**	• On regular basis (eg. weekly), details of user fee received and expenses incurred, including notations of where service is provided free of cost

Basic Steps
in Operationalising a Referral Transport Service

This section is to assist those at the point of operationalising an obstetric RT service by providing five basic steps to follow (Figure 6.1). Each step is described below in detail.

Figure 6.1 Five steps to operationalise an obstetric RT service



6.1 Undertake a situational analysis

Initial decision-making and design must be based upon a thorough understanding of various parameters that will need to be mapped – the primary ones being the size and socio-economic-cultural considerations of the population to be covered, access to and utilisation of skilled birth attendance and EMOC services, and availability of resources. The situational analysis will enable the identification of 1) desired specifications for the RT service and 2) existing resources that will help in estimating the costs of the service. The mapping exercise will also provide an inventory of available maternal health services that will enable the determination of weaknesses and gaps in the system. A detailed matrix to guide the situational analysis process is given at Annex A.

6.2 Identify the required specifications

The tables on minimum and desirable standards for the five main components of RT services will help in identifying the required specifications of the services. They should however be sharpened, based on local context, such as terrain, availability of functional facilities providing emergency obstetric care, etc. The contextual information derived from the situational analysis will help guide this process.

6.3 Cost the required specifications

Draw up a cost budget for the specifications identified for a specific time period, in terms of establishment (non-recurring) and operating (recurring) costs. The situational analysis will help in understanding what resources are available that can be used for RT. The expenditure heads presented in Figure 5.1 will help in costing, and in appraising a cost-estimate.

6.4 Identify financial resources

Based on the budget drawn up, identify where funding will come from. Will it come from NRHM funds? Can corporates be approached for vehicle and equipment donations? The section on ''Generating revenue'' in Section 5.4.2 will assist in identifying potential opportunities.

6.5 Modalities, MoUs/MoAs and to operationalise

The modalities for operationalising the service will need to be devised, creating space for an MoU with partners.

Disclaimers and Limitations

This toolkit was prepared using the information available at the time of the review. It is meant to be a guidance document to assist decision making around operationalising or making improvements to a referral transport service for obstetric emergencies, in rural parts of the country.
KPMG would like to draw attention to the following limitations in respect of the review process:

1. This Study sets forth our views based on the completeness and accuracy of the facts stated and any assumptions that were included. If any of the facts and assumptions is not complete or accurate, it is imperative that we be informed accordingly, as the inaccuracy or incompleteness thereof could have a material effect on our conclusions.
2. Our views are not binding on any authority or court, and hence, no assurance is given that a position contrary to the opinions expressed herein will not be asserted by any authority and/or sustained by an appellate authority or a court of law.
3. Review of the programme was based on information and explanations given to us. Neither KPMG nor any of its employees undertake responsibility in any way whatsoever to any person in respect of errors in this report, arising from incorrect information provided by the project officials.
4. Any product of the Services released to you in any form or medium shall be supplied by us on the basis that it is for your benefit and information only and that, save as may be required by law or by a competent regulatory authority (in which case you shall inform us in advance), it shall not be copied, referred to or disclosed, in whole (save for your own internal purposes) or in part, without our prior written consent. The Services shall be delivered on the basis that you shall not quote our name or reproduce our logo in any form or medium without our prior written consent. **Not withstanding anything contained hereinabove, you may disclose in whole any product of the Services to any third party including** your legal and other professional advisers for the purposes of your seeking advice in relation to the Services, provided that when doing so you inform them that:
   - ➢ disclosure by them (save for their own internal purposes) is not permitted without our prior written consent, and
   - ➢ to the fullest extent permitted by law we accept no responsibility or liability to them in connection with the Services.

   Except UNICEF, no other person shall be entitled to place reliance on this report.
5. You agree to indemnify and hold harmless us from time to time and at all times hereafter, from and against (i) all loss, damage, harm or injury suffered or incurred by us or any of them and (ii) all notices, claims, demands, action, suits or proceedings given, made or initiated against us on account of or arising out of (a) the performance, by us or any of us, of all or any of our obligations hereunder, or (b) any default committed by you in the performance of all or any of your obligations hereunder, **or (c) sharing of our report with any third party**, as also against all costs, charges and expenses suffered or incurred by us on account of the aforesaid. This Indemnity shall not, however, be applicable to the extent that any such notices, claims, demands, action, suits or proceedings are found by a competent Court in its final judgement to have resulted primarily from our wilful default in performing the services described above. If any payment is made by you under this clause you shall not seek recovery of that payment from us at any time. In this clause ''us'' shall include all KPMG Persons and ''you'' shall include Other Beneficiaries.''

Annexures

Annex A: Data Collection for Situation Analysis

Table AA: Data to be collected during situation analysis for setting up an obstetric RT service in a given geographical area

	Parameter	Data required	Why it is important in context of referral transport	How to map and analyse
1.	**State of healthcare infrastructure**	• State of govt. facilities for delivery (PHC, CHC/FRU, hospital). **This should include the availability** and **state of vehicles at these facilities** • Mapping of health facilities in private/ public sector providing BEmONC and CEmONC • State of private facilities for delivery • Average distance to delivery facility • Awareness-levels of ASHAs and ANMs related to emergency obstetric care	• It will help to identify the appropriate referral facility according to the patient's condition • Poorer facilities and longer distances may lend a case to having better equipped ambulances and higher qualified medical attendants • Shorter distances and better facilities may mean that basic ambulances are sufficient • This mapping should also assist to identify locations to site referral transport vehicles.	• Checklist-based forms for each facility • FGDs/discussions with ASHAs, ANMs, and other government health employees • Visual check on vehicles
2.	**Status of healthcare and health outcomes**	• % of births attended by skilled birth attendants • % of deliveries conducted by LSCS • % of deliveries with complications managed in health facilities	• Aim of the RT services is to promote skilled birth attendance, reduce the unmet needs for EmOC, and improve health outcomes	
3.	**Target population**	• Size of target population • Number of villages • Average village size • Density of villages • Expected pregnancies per year • Socio-economic demographics (caste composition) • Security threats	• Understanding who you are providing the service is critical • Understanding how many vehicles you will require to cover the population • Understanding the security threats of the local area is required since this may influence the service's operational modalities.	• Questionnaires • FGDs

4.	**Geographical considerations**	• Type of terrain • Accessibility/ connectivity of villages	• This will determine how accessible villages are, what type of vehicles can ply to the villages, whether there is a need to push for road improvement	• Visual checking • FGDs with existing government health department staff
5.	**State of existing transport context**	• Existence of private vehicle providers • Availability of mechanics/garages/ petrol-pumps	• Private vehicle providers could be brought into the RT service	
6.	**State of existing telecoms context**	• Extent and quality of telecommunications services in area	• This will determine how efficient the telecoms network will be, how many contact numbers are required, which service operators to subscribe to, etc	• Discussions with people at different geographical locations in the area (particularly at village locations, on routes and at facilities, at proposed location for call centre).
7.	**Economic considerations**	• Willingness and ability to pay for service • Mobile phone ownership	• Price should be sensitive to socio-economic conditions and other market factors • Typical mobile phone ownership (and providers)	• Willingness to Pay Survey – this can be done as a broader WTP for health services

B Sample Birth Preparedness Checklist

Sample Birth Preparedness Checklist (Source: Deepak Foundation, Gujarat, India)

- ✓ Mark the date of delivery on the calendar or write it in a place which is easily visible

- ✓ Decide the place of delivery:
  - Decide about the hospital in which you want delivery to take place. Choose the nearest hospital so that in an emergency, patient can be taken immediately to hospital.
  - If the hospital has facility of ambulance, keep the phone number with you.
  - If anybody has a vehicle in the village, please contact and inform the vehicle owner in advance.
  - Keep the phone number of the emergency transport service.

- ✓ Clean and hygienic area should be decided for the PNC woman and newborn baby.
  - Application of cow dung on the floor should not be done before delivery.

- ✓ Clean and washed clothes should be ready well in advance for the mother as well as newborn.

- ✓ Saving of money should be done in advance so that if there is an emergency, the need for money can be solved easily.

- ✓ Transportation facility should be arranged in advance.

- ✓ Help from the local villagers
  - If problems occur during pregnancy, there is a need to be in contact with the villagers for local transportation and for blood requirement.
  - Contact them during emergency.
  - During delivery if an emergency requires blood and if same blood group is not available.
  - Keep list of such persons having the same blood group and those ready to donate blood.

- ✓ Labour pains
  - What are labour pains? It is a process in which uterus contracts at regular interval. This contraction helps a full-term baby emerge out of the uterus.

- ✓ Identification of signs of delivery
  - Painful contraction of uterus at the interval of 10 to 15 minutes.
  - Bleeding with a little sticky discharge.

- ✓ Get all information related to pregnancy in advance so as to be mentally prepared for any developments.

सुरक्षित मातृत्व कार्यक्रम (जननी सुरक्षा योजना)

Manglam मंगलम्, यूनिसेफ एवं राष्ट्रीय ग्रामीण स्वास्थ्य मिशन का समन्वित प्रयास

स्वस्थ एवं सुरक्षित प्रसव हेतु गर्भवती के लिए सूक्ष्म योजना

गर्भवती महिला सम्बन्धित जानकारी :

नाम : .....

पति/मुखिया का नाम : .....

उम्र ..... गाँव ..... पंचायत..... ब्लॉक.....

गर्भ की संख्या ..... जीवित जन्म .....

अन्तिम माहवारी दिनांक .....

प्रसव की सम्भावित तिथि .....

जननी सुरक्षा योजना के तहत लाभार्थी है / नहीं .....

पति / परिवार से बातचीत (× या ✓ निशान लगाएँ ।)

- नर्स बहनजी के पास गर्भवती का नाम दर्ज करवाया है ? ..... ☐
- टिटेनस टॉक्साईड का पहला टीका दिलवाया है ? ..... ☐
- टिटेनस टॉक्साईड का दूसरा टीका दिलवाया है ? ..... ☐
- भूले बिना एक सौ आयरन की गोलियां का क्रम (लौहत्व की 1 गोली प्रतिदिन) आप उन्हें देते हैं ? ..... ☐
- गर्भवती पर्याप्त मात्रा में आहार लेती है या नहीं उसका ध्यान रख रहे हैं ?... ☐
- दिनभर में कम से कम उन्हे 2 घण्टे आराम मिलें ऐसा इन्तजाम किया है ?.. ☐
- गर्भावस्था के जटिल चिह्नों पर निरंतर देखरेख रखते हैं ? ..... ☐

  गर्भवती को नर्सबहन के पास पेट पेशाब की जाँच करवाने व खून का दबाव
- नपवाने हेतु जाते है ? (कम से कम तीन जाँच करवाना आवश्यक है) ..... ☐
- प्रसव दौरान आवश्यकता पड़ने पर काम आयें इस हेतु आप पैसे बचाते है ?. ☐

प्रशिक्षित नर्स का नाम :

पता :

पैसे की जरूरत पड़ने पर सम्पर्क करेंगे ।

नाम :

पता :

फोन नं.

वाहन की आवश्यकता पड़ने पर ...

वाहन के मालिक का नाम :

पता :

फोन नं.

जोखिम उत्पन्न हो तो ....

अस्पताल का पता

फोन नं.

स्वैच्छिक रक्तदान करने वाले व्यक्ति का

नाम :

पता :

फोन नं.

ऐसे चिह्न दिखने पर डाक्टर या नर्स को बतायें ।

- ★ रक्तस्त्राव, बुखार
- ★ अचानक पेट में दर्द होना ।
- ★ बहुत कमजोरी आना ।
- ★ चक्कर आना, सूजन आना ।

स्वास्थ्य कार्यकर्ता | सहयोगी / आशा | फील्ड कार्डीनेटर

आपातकालीन स्थिति में जननी सुरक्षा हैल्पलाइन, बाड़ी : मो. 9351623535, बरेड़ी : मो. 9982565858 पर सम्पर्क करें

C List of Equipment and Supplies to be Kept in Vehicle

The equipment and kits should be available at all times and all staff should know where they are located.

Essential and desirable equipment and supplies	
Minimum	**Desirable (in addition to minimum)**
Equipment	
• Stretcher	• Oxygen delivery system
• Foldable cloth stretcher (to pick up women from interior places in villages)	• Heart-rate monitor
• Stethoscope	• Doppler
• BP apparatus	• Anti-shock garment
• Thermometer	
• Neonatal Ambu bag (1 x 500 ml and 1 x 1000 ml)	
• Disposable baby delivery kit (see below)	
• Sanitary pads	
• Blanket	
• Water	
• Bucket	
• Sick bags	
• Emergency Manual (recognising danger signs in pregnancy)	
Injections and IV Infusions	
• Antibiotic injections (Ampicillin, Metronidazole, Gentamicin) 2 ampuoles each	• Plasma expanders
• Uterotonics (eg. Inj Oxytocin 4 ampuoles, Tab Misoprostol 600 ug)	
• Anti-convulsants (Inj. Magnesium Sulfate) – 5 ampuoles	
• Calcium gluconate 10% in 10 ml – 4 ampuoles	
• DNS 2 bottles	
• Normal Saline 2 bottles	
Tablets/Powders/Ointments/Sprays	
• Aspirin – 325 mg non-enteric coated	
• Paracetamol – 500 mg	
• ORS (Sachets)	
• Glucose	
• Pain relief spray	
Intravenous/Intra Consumables	**Nebulisation**
• Syringe with needle – 22 and 24 gauge (3 sets)	
• Infusion sets	

Essential and Desirable equipment and supplies	
Minimum	**Desirable (in addition to minimum)**
Resuscitation equipment **Neonatal** • Neonatal laryngoscope with small straight blade; size 0 and 1 • Neonatal self inflating bag and masks, size 0,1 and 2 • Endotracheal tubes with connectors and stylets size 2.5, 3, 3.5 • Inj Epinephrine (1:10,000) 1 ml ampoules – 3 • Syringes 1 ml, 2 ml • Elastoplast tape and scissors **Adult** • Oxygen • Ambu bag and mask • Airway # 3	
General	
- Clipboard and pen - Maternal/neonatal transfer form - Flash light - Blankets for mother and baby	

Sterile disposable baby delivery kit	
Minimum	**Desirable**
1. Umbilical cord clamp 2. Blade 3. Mucous sucker (1 - 25 ml) 4. Baby covering sheet 5. Small wipers 6. Big wiper 7. Gloves 8. Couch sheet 9. Perineal sheet	1. Gowns 2. Shoe covers 3. Cap and mask 4. Mops

D Comparison of Five Study Models

Comparison of referral transport models against key parameters					
Parameter	**Guna Model, Madhya Pradesh**	**Khunti Model, Jharkhand**	**Deepak Foundation, Gujarat**	**Mrityunjoy 108, Assam**	**1298, Kerala**
Basic Details					
Management agency	District Health Society, Guna	Karra Society for Rural Development and UNICEF	Deepak Foundation	GVK EMRI	Ambulance Access for All/Ziqitza Healthcare
Operational partners	District Health Department/ Society	District Health Department/ Society	• State government • District Health Department/Society	• State and District • Health • Police • Fire • Private hospitals • GVK	• Government facilities • Private hospitals • Corporate • Private ambulance providers
Initiated – month/year	September 2007	September 2008	2005	November 2008	December 2007 (Mumbai service started in 2003.)
Coverage	District-wide: Guna district, MP. Project being replicated in 10 more districts in state	4 blocks: Khunti district, Jharkhand	4 blocks: Vadodara district, Gujarat (but part of district-wide Safe Mother and Child Survival Project)	State-wide: All districts of Assam	Multiple districts (8): Kozikhode, Trivandrum, Kottayam, Allapuram, Ernakalum, Kollam, Pattanimthita, Thrissur
Area profile	Roads and healthcare infrastructure in development phase. Delivery centre in a radius of 20-25 km	Naxal affected area. Majority of population is tribal. Poor health seeking behaviour	Tribal population in majority. Road infrastructure at village level recently much improved. Health infrastructure supported by a CEmONC	A mix of hilly terrain and plain areas. Some districts are affected by insurgency problems. Very high MMR rates	High literacy rate. Low MMR. Good health seeking behaviour of communities. Good health facilities

Comparison of referral transport models against key parameters					
Parameter	**Guna Model, Madhya Pradesh**	**Khunti Model, Jharkhand**	**Deepak Foundation, Gujarat**	**Mrityunjoy 108, Assam**	**1298, Kerala**
User Fee?	✗	✓ Chargeable: • Rs 250 per 10 km (day time) • Rs 500 per 10 km (night time)	✓ Rs 2 per km (can be waived according to socio-economic status)	✗	✓ Sliding scale of payment according to socio-economic status and the facility to which patient is transferred to
Points of transport	Home to hospital. Transport only to government facilities	Home to hospital. Transport only to government facilities	Home to hospital. Transport to government and private facilities	Home to hospital. Small amount of inter-institution. Mostly to government facilities. Small percentage of cases are also transported to private hospitals (EMRI has MoU with few private hospitals)	Home to hospital and inter-institution. Government and private facilities.
Second referral – one institution to another	✓ (chargeable)	✓ (chargeable)	✓ (chargeable)	Very rarely (chargeable)	✓
Technical support	UNICEF	UNICEF			(London Ambulance Service)
Financial Details					
PPP	Government only	✓	✓ (60% govt)	✓ (95% govt)	No
Main Funding	Initial support from UNICEF. Now taken up by Government of MP under NRHM	UNICEF	Government of Gujarat (60%)	95% from Government of Assam (NRHM) and remaining 5% mobilized by EMRI	Private model. Received seed support from Acumen Fund and advertising revenue and vehicle donations from corporates

Comparison of referral transport models against key parameters					
Parameter	**Guna Model, Madhya Pradesh**	**Khunti Model, Jharkhand**	**Deepak Foundation, Gujarat**	**Mrityunjoy 108, Assam**	**1298, Kerala**
Fund raising/ contribution from others	District Collector mobilized vehicles from different government departments. 4 vehicles donated by private sector		From Deepak Foundation. (as part of Deepak Group of Industries)		Various corporate donors of ambulances and ambulance equipment.
Size of vehicle fleet	23	83	8	280	28
Type of vehicle used	Jeeps, Maruti vans, etc. Not converted as ambulances	JTempo, Tata Sumo, Magic Savari, Maruti Suzuki vans/ cars, auto, jeep, Piyago, Commander and tractors (very rarely used) Not converted as ambulances	Converted Maxx jeeps and Tata vans	ALS Ambulances (Force Tempo Traveller and Tata)	ALS Ambulances (Force Tempo Traveller) and BLS ambulances (Maruti Omini vans)
Average coverage per vehicle	• 2 vehicles per block • 1 vehicle per 54 villages	• 1 vehicle per 4-5 villages • 20 vehicles per block	• 2 vehicles per block	• 1 vehicle per 1-1.5 lakh population (EMRI norms) • Average 6 vehicles per district.	• 2 vehicles per district
Recurrent cost/ beneficiary*	Rs 480/ beneficiary	Not available. Families bear a large proportion	Rs 550 per beneficiary	Rs 600-750 per beneficiary	Not available
GPS installed in vehicle?	No	No	No	No, but plans to	Yes

EmOC resources available in vehicle	✗	✗	✓ • Oxygen • Disposable baby-delivery kit	✓ • Oxygen • Defibrillator/ Ventilator • Disposable baby-delivery kit • Other emergency medical equipment/ medicines	✓ • Oxygen • Defibrillator/ Ventilator • Disposable baby-delivery kit • Other emergency medical equipment/ medicines
Vehicles location?	Delivery centres (sub-centres and PHCs)	No fixed place – at owner or driver's house	NGO offices at block level	Police stations, PHCs and CHCs (and local admin. offices)	Typically at institution
* Excludes the cost of depreciation of vehicles. Capital costs across the models are difficult to estimate and not comparable across the models					

Vehicle Staff Details					
Staff with vehicle	• 1 x Driver	• 1 x Driver	• 1 x Driver	• 1 x Pilot (Driver) • 1 x Emergency Medical Technician (EMT)	• 1 x Driver • 1 x Emergency Medical Technician (EMT) • 1 x Male Nurse
Qualifications/ Experience of staff	• None specified	• None specified	• None specified	• Driver –Matric (10th standard) pass, holding HGV license and 3-5 years experience • EMT – Graduate (B.Sc. or B.Ed.)	• EMT – Graduate in nursing with 2-3 years experience in EMT • Nurse – Graduate with experience in basic medical treatment • Driver – Matric (10th Standard) pass with HGV license and 3-5 years experience
Training given to ambulance staff	• None	• Drivers – sensitized on EmOC and referral transport	• Drivers – training on basic first aid, communications skills and financial discipline • Other project staff – training on handling emergency cases and providing first aid.	• EMT – 45 days induction training plus follow-up training. 3 days training on obstetric learning. • Driver – 15 days first aid training	• EMT and Nurse – 3-3.5 days training on Basic Life Support, Advanced Cardiac Life Support (ACLS), International Trauma Life Support (ITLS), training on use of equipment. No specific training on EmOC. • Drivers – 0.5-1 days training on Basic Life Support.

Does the ASHA typically accompany in vehicle?	✓	✓	✓	✓	Not known
Call Centre					
Call Centre	1 Located at district hospital.	4 One per block, located at PHC/ CHC	1 Located at Deepak Foundation's office, Bodeli	1 Located at EMRI headquarters, Guwahati	1 Located at 1298 headquarters, Mumbai
Number of Call Operators (per shift)	1	1	1	20-25 (72 total over 3 shifts)	2-4 (12 total over 3 shifts) only for Kerala
IT used	• Simple landline phone number at call centre and mobile phones for the drivers. Software has been developed in Visual Basic by UNICEF	• Regular landline number used at call centre • MS Excel used for data management	• Two mobile numbers are used • MS Excel used for data management	• One number reachable from landline and all mobile networks • Several Java-based automated software packages used	• One number reachable from landline and all mobile networks • 4 software packages used: • CAD - call management software • AVLS– Automatic Vehicle Locating Service based on GPS • Datacommunication package between control room and ambulances • GPS units in ambulances.
Strategy to promote model in the community	ASHAs, ANMs and PRI members have been sensitized to promote the services in the villages	Self Help Group members, ASHAs, and ANMs have been sensitized to promote the services in rural areas	Village-level workers (employed with Deepak Foundation's larger Safe Motherhood and Child Survival Project) promote number in community. ASHAs + Outreach Staff + VHSC	Vehicle demonstrations (while on and off call), sessions with school children	Through doctors, facilities, training of First Responders & NGOs. Various marketing initiative to promote the number 1298

E Sample Referral Slip

Registration Number:
Name of Patient: **Date and Time:**
Age: **Sex:**
Address:

Reason for referral/Diagnosis:

History:

_____
_____
_____
_____

Examination (at the time of referral):
General condition:
Pulse:
BP:
Temperature:
Systemic Examination:

_____
_____
_____
_____

Investigations done (if any with date and report):

_____
_____
_____

Treatment given (Mention dose, route, date and time of administration):

1. _____
2. _____
3. _____
4. _____
5. _____

Referred to (Name and/or location of Health facility):

_____

_____

(Signature & Name of Medical Officer)

Name of PHC, District

(States may make colour coded referral slips for different Districts/PHCs)

F People Consulted

Agencies/INGOs/Government

- Dr Himanshu Bhushan, Assistant Commissioner – Maternal Health, Ministry of Health and Family Welfare, Government of India
- UNICEF Delhi – Dr Pavitra Mohan and Dr Sonia Trikha; UNICEF Bihar – Dr Sufia Askari; UNICEF Gujarat – Dr Narayan Gaonkar
- UNFPA, New Delhi – Dr Dinesh Agarwal
- DFID, New Delhi – Dr Rashmi Kukreja, Health Advisor
- USAID, New Delhi – Dr Rajeev Tandon
- Aga Khan Development Network, New Delhi
- Voluntary Health Association of India, New Delhi – Dr Abhilash Malik
- Practical Action, Nepal – Jun Hada, Access to Infrastructure Services Program
- Various NRHM/state government officials to understand the situation with referral transport in their own states.

Corporates/Local NGOs

- Vedanta Resources plc – Ruby Thapar, Vice President and CSR Head
- KGVK, Jharkhand – Mr Shibaji Mondal
- The Action Northeast Trust – Jennifer

Models (besides also meeting beneficiaries in all places)

Assam

- GVK EMRI ''Mrityunjoy 108'' team (including Mr Tyagi, COO and Mr Kuldeep Saxena, PPP Hospital Relations)
- UNICEF Assam – Dr Ajay Trakroo, Health Specialist
- Dr B N Sarma, JD Health, Darrang district
- PDM, NRHM, Darrang district
- Dr Kalita, JD Health, Sonitpur district
- Ms Shyamli, PDM, NRHM, Sonitpur district
- Doctors, CHC, Kamrup
- Doctor-in-charge, CHC, Orang
- ASHA workers, link workers, Block Programme Manager, ANMs

Gujarat

- Deepak Foundation team (including Mrs Archana Joshi, Director, and Dr Nandini Srivastava, Deputy Director, Deepak Foundation; gynaecologist at CEmONC

Jharkhand

- Karra Society for Rural Action (KSRA) team (including Mr Syed Afzal Ahmad, President, and Mr Shamim Akthar, District Project Coordinator)
- UNICEF Jharkhand – Dr Madhulika Jonathan, Health Officer and Mr Abhishek Anand, District Extender
- Mr Sharad Pandey – Skill Birth Attendant training Consultant, UNICEF
- Dr Anuradha Kashyap – Deputy Superintendent, RCH
- Mr. Rajan Kumar, State Programme Manager, NRHM
- Dr C.P. Vivakar – Civil Surgeon, Khunti district
- Dr Nageshwar Mazhee – Medical Officer, Torpa Referral Hospital
- Dr Lalit Ranjan Pathak – Medical Officer, PHC, Karra

Kerala

- Ambulance Access for All (1298) team – Mr Nijil Ibrahim, Project Head, Kerala; Joemon Thomas, Operations Manager; and Radheesh V, Program Coordinator, 1298/108 Kerala
- 1298/Ziqitza Healthcare – Ms Sweta Mangal, CEO, and Mr Amit Alexander
- Mr. Pradeep Kumar AB, Chief Consultant (Engineering & Procurement), NRHM, Department of H&FW, Kerala
- Mr. Suresh Kumar, Chief Consultant (Administration and Human Resource), NRHM, Department of H&FW, Kerala
- Dr. Sandeep K, Consultant (Monitoring & Evaluation), NRHM, Department of H&FW, Kerala
- Ms. Seena KM, Consultant (Social Development), NRHM, Department of H&FW, Kerala
- Dr Aruvi, Resident Medical Officer, Government Civil Hospital, Ernakulum

Madhya Pradesh/Guna

- Dr Ramvir Raghuvanshi, District RCH Officer, Guna
- Shennaz Khan, Transport Coordinator

Expert Panel Workshop group

A) Experts/Practitioners

- Dr Sunita Mittal, Head, Department of Obstetrics, AIIMS, Delhi
- Dr Sushma Nangia, Secretary, National Neonatology Forum, Delhi
- Dr Shubha Sagar Trivedi, Head, Department of Obstetrics, Lady Hardinge Medical College, Delhi
- Dr Ragini Agrawal, FOGSI, Gurgaon
- Dr LB Asthana, Deputy Director, Emergency Transport Services, Madhya Pradesh
- Dr RS Raghuvanshi, Health Officer, Guna, Madhya Pradesh
- Dr Sandip Ghose, NRHM, Assam
- Dr Ramana Rao, Executive Partner, Emergency Medicine Learning Centre (EMLC) and Research, GVK EMRI, Hyderabad, Andhra Pradesh
- Mr Shardul Acharya, Senior MIS Coordinator, Deepak Foundation, Gujarat
- Mr Syed Afzal Ahmad, President, Karra Society for Rural Action, Jharkhand
- Dr Vijay Reddy, Dial 1298/Ziqitza Healthcare, Delhi
- Dr Kirti Iyengar, Action Research and Training for Health, Rajasthan
- Mr Ashok Tiwari, Manglam, Dholpur, Rajasthan

B) UNICEF Staff

- Dr Henri van den Hombergh, Delhi
- Dr Pavitra Mohan, Delhi
- Dr Sonia Trikha, Delhi
- Ms. Kimberly Allen, Delhi
- Dr Madhulika Jonathan, Jharkhand
- Dr Ajay Trakroo, Assam
- Dr Ravichandran, Chennai
- Mr. Bhawani Shankar Tripathy, Delhi
- Dr Narayan Gaonkar, Gujarat
- Dr Gagan Gupta, Madhya Pradesh

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