

**Assessing the Regional and District Capacity for
Operationalizing Emergency Obstetric Care
through First Referral Units in Gujarat**

**Parvathy Sankara Raman
Bharati Sharma
Dileep Mavalankar
Mudita Upadhyaya**

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**INDIAN INSTITUTE OF MANAGEMENT
AHMEDABAD-380 015
INDIA**

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Parvathy Sankara Raman
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Abstract

As per the Sample Registration System, the current maternal mortality ratio for India is 301 per 1 lakh live births. Emergency Obstetric Care (EmOC) is crucial for preventing maternal deaths for which the policy has been to establish First Referral Units (FRUs). Twenty seven facilities from 6 districts from each administrative region of Gujarat were studied to understand the management of EmOC at regional, district and below the district levels. In all 7 district hospitals, 8 FRUs, 4 community health centers (CHC) and 8 round the clock primary health centers (PHC) were selected. Observation checklists, semi-structured interviews with service providers were used to collect data. The results showed that;

1. Even though the concept of FRUs for EmOC has been a policy since 1992, detailed implementation strategy and guidelines were developed only in 2003
2. Government health institutional network is fairly good, yet the infrastructure is incomplete, especially in the labor rooms
3. Staffing of EmOC centers has been neglected in the past but now the government of Gujarat is making efforts to ensure availability of trained staff, yet it is still inadequate
4. The available staffs are not qualified, many a times they do not have skills for managing obstetric complications
5. Though there are nurse-midwives available, there is no cadre of midwives dedicated for maternal health
6. Standard evidence based clinical protocols are not followed
7. There is limited management capacity at all levels (state, regional and district), management of FRUs is not assigned to any specific state level manager, the management and administrative control of FRUs is divided amongst two directorates in Gujarat raising issues of accountability.
8. The management information system of the health department does not capture the functioning of FRUs.
9. Maternal deaths occurring both in and out of institutions are not recorded and monitored systematically.

The study gives specific recommendations for improving the management of FRUS in Gujarat.

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List of Abbreviations

AMDD	Averting Maternal Deaths and Disability
ANC	Ante Natal Care
ANM	Auxiliary Nurse Midwife
BEmOC	Basic Emergency Obstetric Care
BPL	Below Poverty Line
CDHO	Chief District Health Officer
CDMO	Chief District Medical Officer
CEmOC	Comprehensive Emergency Obstetric Care
CHC	Community Health Centre
CMR	Child Mortality Rate
CSSM	Child Survival and Safe Motherhood
DH	District Hospital
DLHS	District Level Household Survey
MoHFW	Ministry of Health Family Welfare
DP	District Panchayat
DPC	District Programme Coordinator
EC	European Commission
EmOC	Emergency Obstetric Care
FHW	Female Health Worker
FOGSI	Federation of Obstetrics and Gynaecology Societies of India
FRU	First Referral Unit
GOG	Government of Gujarat
GOI	Government of India
GSACS	Gujarat State AIDS Control Society
IAS	Indian Administrative Services
IFA	Iron Folic Acid
IMR	Infant Mortality Rate
LHV	Lady Health Visitor
LR	Labour Room
MBBS	Bachelor of Medicine Bachelor of Surgery
MCH	Maternal Child Health
MMR	Maternal Mortality Ratio
MO	Medical Officer
NFHS	National Family Health Survey
NGO	Non Governmental Organization
NHP	National Health Policy
NRHM	National Rural Health Mission
OT	Operation Theatre
PHC	Primary Health Centre
PHN	Public Health Nurse
RCH	Reproductive Child Health
RKS	Rogi Kalyan Samiti
SBA	Skilled Birth attendant
SC	Sub Centre
SDH	Sub district hospital
SRS	Sample Registration System
TBA	Traditional Birth Attendant
TFR	Total Fertility Rate

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Assessing the Regional and District level Capacity for Operationalizing Emergency Obstetric Care through First Referral Units: Gujarat

1. Introduction

Public health initiatives over the last two to three decades have helped India to improve health indicators such as life expectancy and total fertility rate to a great extent, but some crucial indicators like MMR and IMR have stagnated at around 300-400 per 100,000 live births and 53 per 1000 live births respectively in the 90s⁽¹⁾. According to the special survey conducted by RGI for estimating maternal mortality the MMR is estimated as 301. The IMR according to SRS (2006) is 57. Since independence in 1947, India has developed a rural public health system. It has an implementing organization in form of Primary Health Centres, even though its quality and accountability of services are major issues. Staff in government health infrastructure is full time employees. In spite of the rural health infrastructure, even now about one million (20% of global) women and 2.1 million (21%) of child mortality are in India, in which 50% of child mortality is due to neo-natal reasons which is the highest for any country.

1.1. International focus on maternal mortality reduction

Pioneering research done at Columbia University, School of Public Health over the last 15 years has conclusively shown that the best and most cost effective strategy for reduction in maternal mortality is to provide Emergency Obstetric Care (EmOC¹)⁽²⁾ services within the reach of all pregnant women⁽³⁾.

A re-look at the causes of maternal death and the health system factors contributing to maternal death brought out a completely new understanding of how to prevent maternal mortality⁽⁴⁾. This research showed that:

- Complications cannot be predicted & so high-risk approach really does not help much.
- Most complications cannot be prevented by good ANC
- If obstetric complications are handled effectively, mortality could be substantially reduced.
- It was also shown that once major obstetric complications develop, even a trained TBA or a nurse cannot do much at home as many of these complications require surgical interventions, injections of antibiotic, blood transfusion and other aggressive treatment.
- Cost-effective approach to reducing maternal mortality is by ensuring high quality emergency obstetric care (EmOC) to mothers who develop complications during delivery.

¹ EmOC – BEmOC and CEmOC functions

- BEmOC functions include: Administer parenteral antibiotics, Administer parenteral oxytocic drugs, Administer parenteral anticonvulsants for pre-Eclampsia and Eclampsia, Perform manual removal of placenta, Perform removal of retained products, Perform assisted vaginal delivery
- CEmOC Functions: all the BEmOC functions, blood transfusions, c-section

This international evidence brought substantial re-thinking about strategies to reduce maternal mortality in the developing countries. Many donors also incorporated EmOC as one of the key strategies in their assistance programmes. Recent article in *Lancet* says that “The Millennium Development Goal for maternal health (MDG-5)—to reduce maternal mortality by two-thirds by 2015—can best be achieved by adopting a core strategy of health centre-based intra-partum care (HCIC)”⁽⁴⁾. Governments need to be held accountable for the comprehensive provision of facility-based midwifery and obstetric care, which should be a key component of any national safer motherhood strategy⁽⁴⁾.

1.2. National Context

In India during the sixties and seventies, maternal health services under MCH (maternal and child health) focused on ante-natal care and high-risk approach. It was thought that good ANC along with high-risk approach will help in reducing maternal mortality. As traditional birth attendants (TBAs) were conducting many deliveries, it was thought that MMR will decline by training them. But after several years of implementing these approaches, it was realized in mid-eighties that maternal mortality was still very high in India.

The strategy of establishing fully functional 24/7 First Referral Units (FRUs) for Emergency Obstetric Care has been expressed in India’s national MCH program and health policy documents from the time of CSSM programme (1992 to 1997)⁽⁵⁾. It was further re-emphasised under RCH I programme (1997- 2004)⁽⁶⁾.

In spite of almost fifteen years of efforts to operationalize EmOC and improve delivery care these efforts are not been very successful. Our previous research showed that management capacity at state and national level for maternal health is highly limited⁽⁷⁾.

1.3. Overview of the National & State Maternal Health Strategies- RCH-II under NRHM

The National Rural Health Mission (2005-12) of the GoI is a major new initiative to revamp the health system. One of the key objectives of NRHM is to reduce IMR and MMR by 50% by 2012. The goals for maternal health as stated in the RCH-II Programme Implementation Plan⁽⁸⁾ are to reduce maternal mortality rate through institutional deliveries see (Table-1).

Table-1: Maternal Health goals and Strategy in RCH-II documents

Goals	
1. Reduce maternal mortality rate to less than 100 /100,000 live births by the year 2010 [Current level: 407 (SRS 1998)]. 2. Increase proportion of institutional deliveries to at least 80% by 2010 [Current level 39.8% (RHS 2002-03)]	
Strategy	Activities
1. Enhance availability of facilities for institutional deliveries and Emergency Obstetric Care (EmOC)	<ul style="list-style-type: none"> • Operationalize all CHCs and at least 50 % of PHCs for providing 24 hour delivery services including the management of common obstetric complications, emergency care of sick children and referrals • Operationalize EmOC & Child Care services at 2000 First Referral Units • Strengthening rural health infrastructure through national standards (IPHS), local flexibility and finances through Rogi Kalyan Samitis • Ensure access to blood bank at all district hospitals & blood storage facility at FRUs • Train MBBS medical officers in anaesthetic skills for EmOC • Train MBBS doctors in conducting caesarean sections • Provide EOC services to BPL families at recognized private facilities
2. Behaviour change communication and community mobilization (Demand side interventions)	<ul style="list-style-type: none"> • Payment of cash incentives to increase institutional deliveries (Janani Suraksha Yojana) • Educate communities about danger signs in the pregnancy, labour and post-partum period. Use media and other BCC/IPC strategies to enable individuals, families and communities to recognize signs of obstetric emergencies. • Launch a sustained social mobilization effort for institutional deliveries with the help of PRIs, opinion leaders, NGOs, self-help groups as well as AWWs, link volunteers, ANMs and other stakeholders. • Reward villages that achieve high rates of institutional deliveries and save mothers with obstetric emergencies through timely action. • Promote referral transport for routine deliveries and emergency obstetric care. Make referral transport funds available with AWW/ANM. • Map facilities; plan transport options; encourage innovative solutions
3. Provide skilled care to pregnant women at the community level	<ul style="list-style-type: none"> • Promote deliveries by SBA at sub-centres and in the community • Permit ANMs to administer obstetric first-aid: In order to save lives of women with obstetric complications in the community, the ANMs be permitted to use the following drugs: Inj. Oxytocin, Inj. Magnesium Sulphate, Misoprostol (oral), Oral Ampicillin, Inj. Gentamicin, Oral Metronidazole

1.4. Guidelines on maternal health

Over the last few years (2003-2006) there are a number of guidelines developed by the government of India, some specifically for maternal health services and some broader facility guidelines such as the Indian Public Health Standards (IPHS) for facilities which indirectly could influence maternal health services. Both these type of guidelines were reviewed for this study (table-2). The following guidelines were reviewed for their components related to MH:

- Guidelines for Operationalizing FRUs developed by the Maternal Health Division, Ministry of Health and Family Welfare, in 2004
- Guidelines for Operationalizing PHC for providing 24 hour delivery and new born care under RCH II Ministry of Health and Family Welfare, in 2005
- Guidelines for Ante Natal Care and Skilled Attendance at Birth by ANMs and LHVs, Ministry of Health and Family Welfare, in 2005
- Guidelines for Pregnancy care and Management of Common Obstetric Complications by Medical officers, Ministry of Health and Family Welfare, in 2005

- Indian Public Health Standards (IPHS) for CHC and PHCs , Ministry of Health & Family Welfare Government of India,2004
- Guidelines For Setting up Blood Storage Centres At First Referral Units (2003)

A brief summary of some of these guidelines are given as annex 1.

Name of the document	Objective as stated in the guidelines	Comments
Guidelines For Setting Up Blood Storage Centres At First Referral Units (2003)	<ul style="list-style-type: none"> • To extend services for providing safe blood at sub-district levels, i.e. First Referral Units (FRUs) through Blood Storage Units. • Recommends a minimum bed strength of 50 beds at FRU to have a blood storage unit 	<ul style="list-style-type: none"> • Gives specific instructions for all the requirements (infrastructure, equipments manpower) • Standard operating procedures and clinicians guidelines. • Guidelines are implemented stringently sometimes making it difficult to setup blood storage units. • Causes delay in setting up Blood storage center
Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers at PHC, CHC (2003)	<ul style="list-style-type: none"> • Reference material for medical officers (MOs) for managing obstetric complications at facilities offering emergency management of common obstetric complications. • Meant for service providers and programme managers to design technically sound and effective interventions • Could help for training programmes for MOs 	<ul style="list-style-type: none"> • Covers normal deliveries, complicated deliveries and quality of care • Cannot be used directly for training – needs trainers/facilitators guidelines.
Guidelines for Operationalizing First Referral Units (2004)	<ul style="list-style-type: none"> • To assist the states to plan for Operationalizing FRUs- determining the type and quantum of assistance required. • The guidelines are basically suggestive in nature-states have the flexibility of making appropriate decisions. 	<ul style="list-style-type: none"> • They are managerial guidelines for states. • Do not include suggestions for monitoring and documentation of services
Guidelines for Operationalizing a Primary Health Centre for Providing 24-Hour Delivery and Newborn Care Under RCH-II (2005)	<ul style="list-style-type: none"> • Assist the States to plan for & operationalize at least 50% PHC as 24-hour functional units in a phased manner, for providing round the clock delivery services; management of common obstetric complications, emergency care of sick children and referrals. • Reference material for the district Programme Managers and MO In-charge of 24-hour PHCs. 	<ul style="list-style-type: none"> • Out of 9 services listed in the essential service package, 3 critical determinants of functionality are 24 hours delivery services (normal and assisted), essential newborn care, and referral for emergencies. • The guidelines are comprehensive but do not cover monitoring indicators or monitoring systems for 24/7 PHCs.

1.5. Maternal Health Care System in Gujarat

Gujarat also has a three tier health care system- at Level-I a sub centre covering 5,000 population and a Primary Health Care Centre (PHC) with six beds catering to about 30,000 populations. Level-II is Community Health Centres/First Referral Units (CHC/FRU) for every 300-500 thousand population; and level-III is the District Hospital located at the district town with 100-300 beds. Above the district hospitals there are larger hospitals which are tertiary care facilities mostly teaching hospitals with facilities for advanced treatment. Details are given in table -3.

Health Care Institution	Norm: Population	Actual Population covered (2005)	Numbers in Gujarat (2006)	Level	Highest Medical Services Provider	Maternal health services
Medical College Hospitals	5-8 million	NA	08	Apex	Super Specialists	Obstetric & Gynaecological OPD CEmOC services, Intensive care
District Hospital	2- 3 Million	NA	25	III	Specialists including Obstetrician	Obstetric & Gynaecological OPD CEmOC services
First Referral Unit (FRU)	3 – 5 lakhs	NA	22	II	Obstetrician	Obstetric OPD & CEmOC services
Community Health Centre (CHC)	1 – 3 lakhs	116694	272	II	Medical Officer/Specialists	Obstetric OPD BEmOC
PHC	30,000	29664	1072	I	Medical Officer, Staff Nurse/ANM	Antenatal BEmOC and Post natal services
Sub-centre	5,000	4364	7274	I	Auxiliary Nurse midwife (ANM)	Outreach services for antenatal, normal delivery and post natal services
Source ⁽⁹⁾ : Bulletin of Rural health statistics, 2006						

The Female Health Worker/Auxiliary Nurse Midwife (ANM) posted at the sub-centre is responsible for providing continuous maternal health services; registering pregnant women, ensuring regular antenatal services, and motivating them for institutional delivery; she also can attend deliveries at home, and provide postnatal care, and referring women with high risk pregnancies. The ANM and Lady Health Worker (LHV) also assist the medical officer at PHC, where both curative and preventive services are provided. A medical officer and staff nurse at the PHC and CHC are responsible for providing antenatal care, conducting deliveries, providing basic emergency obstetric care and referral, postnatal care and family planning services. First referral units and district hospitals are supposed to be equipped to provide comprehensive emergency obstetric care.

1.5.1. State Level Initiatives for Improving Maternal Health

Gujarat is implementing interventions for maternal health according to the National guidelines. Learning from the past experience of trying to establish functional FRU during CSSM and RCH-I, government of India has suggested alternative strategies for solving the problem of non-availability of specialists in remote rural areas. Staff nurses and ANMs have been allowed to deal with simple delivery complications during emergencies. Gujarat has introduced several innovations in improving maternal health situation in the state. These initiatives are (1) Chiranjeevi (2) Emergency referral services (Dial 108) (3) ANM training (4) Training of medical doctors for providing CEmOC services, (5) training of medical doctors for giving life saving anaesthesia.

Gujarat has been the first state to begin the training of MBBS Doctors in anaesthesia and Comprehensive Emergency Obstetric Care in collaboration with the Federation of Obstetricians and Gynaecologist Society of India (FOGSI). All selected trainees sign a bond of 3 years to serve the government. As seen in Table-4, till February 2008, 44 MBBS doctors have been trained in C-sections and 60 in anaesthesia. Six hundred doctors and 1200 staff nurses have been trained for 2 weeks in BEmOC. As the training is skill based, it has been made voluntary to ensure that only motivated professionals are trained. Recognizing the fact that the staff nurses and ANMs have lost their midwifery skills, Gujarat has initiated refresher training for Staff nurses and ANMs.

Total designated FRUs	102
Total Functional FRUs	25
Total Obstetricians in FRUs	19
MBBS trained in CEmOC	44 (as on Feb 2008)
MBBS trained in Anaesthesia	60 (as on Feb 2008)
MBBS trained in BEmOC	600
Staff Nurses trained in BEmOC	1200
Refresher to Staff Nurses	3000
Source ⁽¹⁰⁾ : Presentation made by Dr Ajesh Desai, Consultant Maternal Health, Government of Gujarat	

1.5.2. Chiranjeevi Scheme

In addition to following the national guidelines for maternal health, Gujarat has on its own initiative introduced a voucher scheme the “Chiranjeevi Scheme” for covering the cost of delivery services in private sector for Below Poverty Line (BPL) women. According to this scheme the BPL women can avail the services of private gynaecologist free of cost and she will receive Rs 200/- as transportation cost from the gynaecologist. The gynaecologist receives a payment of Rs 1700, irrespective of the delivery type from the state government.

1.5.3. Rogi Kalyan Samiti

Rogi Kalyan Samitis (RKS) were started in Gujarat during 2004, following the success of this kind of Samitis in the state of Madhya Pradesh. This autonomous Samiti was formed to improve patient care in medical college hospitals, district hospitals and CHCs. The RKS is allowed to charge user fees from the patients with respect to the income of the patients. The funds from the government will be deposited in the joint names of the district collector and the superintendent of the concerned facility. The CDMO of district hospital has the drawing power of Rs. 50,000 (\$1190) for a single item whereas for superintendent of CHC/FRU has the drawing power of Rs. 25,000 (\$595). The main functions of the RKS include regular maintenance, repair and necessary construction of physical facilities as per government rules, to maintain cleanliness at the facility by hiring contractual cleaning staff, purchase of emergency drugs, chemicals, furniture, linen and other stationary article and provide quality medical services to the poor for free of cost or less compared to private facilities. Because of RKS the hospital administrators are able to hire contractual staff of cleaning, do minor repair which earlier come under the direct control of the state level administrators.

Each district hospital receives Rs. 10 lakhs from the state government as part of RKS. Along with these funds they are able to collect an additional Rs. 30-40 thousand through user fees which is collected from non- BPL population (Rs 2.00 for OPD case, Rs. 5 for Indoor case, Rs. 10 for X-ray, Rs. 100 for operations etc). The money in RKS has been used by district

hospitals for minor repairs in the building, purchase of linen and bed sheets, putting up benches for the patients, hiring staff for cleaning etc.

2. Study setting and methodology

2.1. Objectives

The study is aimed to understand basic functionality and management issues at the state and district level for EmOC service delivery. The objectives of the study are:

1. Assess the technical and managerial capacity at the facility, regional and district level for planning and implementing FRUs and monitoring the quality of EmOC services.
2. Suggest ways to improve the functioning of EmOC and enhance the management capacity.

The study is not a large scale evaluation of the EmOC facilities, but it is a qualitative investigation to find the managerial challenges and assess managerial capacities for EmOC service delivery. The study is a part of a larger project to help strengthening midwifery and Emergency Obstetric Care in India, coordinated by the Indian Institute Management (IIM) Ahmedabad and supported by the Swedish International Development Agency (Sida).

2.2. Methodology

As it is a qualitative study it was decided to purposely sample only few facilities at each level to identify critical management problems. Gujarat state is divided into 6 administrative regions; one district from each region was selected for the study. The districts selected from the 6 regions were Kheda from Ahmedabad region, Banaskantha from Gandhinagar region, Rajkot from Rajkot region, Dahod from Vadodara region, Valsad from Surat region and Amreli from the Bhavnagar region. We requested the government to help identify list of facilities which should be studied. Based on the list provided from government, facilities were purposively selected.

Since the objective is to assess the management practices for EmOC, the facilities were selected with the following aspects in mind:

- The performance of the facility in terms of number of deliveries in a month. Some facilities with very less number of deliveries were also selected to understand the reasons behind poor performance.
- Facilities where alternative staffing has been tried out. For example where GoG has placed MBBS doctors trained in CEmOC and Anaesthesia.

A total of 27 facilities were visited from which seven were District Hospitals (Table 5). All district hospitals, Sub District and designated FRUs are designated as CEmOC facilities – the first tertiary care centre below the teaching hospitals where facilities for C-section, blood transfusion and essential newborn care would be available. In addition to the 6 district hospitals one additional hospital was visited as suggested by the government.

Type of facility	Total Number in the State*	Number of facilities Selected
District Hospitals	25	7
First Referral Units designated by Government (Sub-dist hospitals and FRUs)	22	8
Community Health Centres	272	4
Total Primary Health Centres	1073	
24/7 PHC	187	7+1 other PHC
Total		27
*Source ⁽⁹⁾ : Bulletin of Rural health statistics, 2006, Annual administrative report of Gujarat 2006-07		

Eight first referral units were covered out of which five were sub-district hospitals and three were CHCs designated as FRUs. The team also visited four CHCs which were not FRUs but were providing EmOC services. In addition to the district hospitals and FRUs the team also visited the 8 PHCs which provide BEmOC Services which include six 24/7 PHCs and two normal PHCs.

2.3. Data Collection

Various tools used for other FRU studies were reviewed and adapted for the study, such as:

- Guidelines for Operationalization of First Referral Units, 24/7 PHCs
- Indian Public Health Standards guidelines for 24/7 PHC, CHCs, SCs, Sub district hospital.
- Tools developed by UNFPA Rajasthan for conducting facility surveys at Rajasthan with support from Averting Maternal Deaths and Disability project, Columbia University.
- Tools prepared by ICDDRB for data collection in Bangladesh for the safe motherhood project supported by DFID
- Facility survey conducted by Government of India

The component covered by each tool is explained briefly in table-6. The tools were pilot tested in one CHC and modified. For example detailed analysis of the various pharmacy records was dropped and a more detailed analysis of the records maintained in the labour room was included. In addition to these tools wherever possible the team observed some deliveries being conducted and had brief discussions with beneficiaries.

Type of tool	Method	Details
Observation checklist	Observation	To observe the physical infrastructure, general cleanliness, Labour room, OT, Wards, Laboratory etc
Records and registers	Transcription	Overall annual report of facility which included performance statistics, human resource situation, supply and equipment etc. and Register and records related to maternal health maintained in wards, OT, and LR etc.
In-depth semi-structured interviews	Interviews	With service providers and support staff of the facilities, state, regional and district level officers.
Collection of various reports	-	Monthly and annual reports of the facility, forms like form nos- 7,8,9 which are submitted to state government
Photographs		For detailed analysis of the infrastructure

Data was collected using observation checklists and semi-structured interviews photographs were taken in selected locations to highlight good practices and management problems. Data for the study was collected between January to March and August to December in 2007. The research team included a public health specialist, a nurse midwife and researchers trained in management and social sciences. Detailed field notes for individual facilities were prepared and qualitatively analyzed subsequently for all facilities together to prepare this report.

3. Results

The team visited 19 facilities which provide CEmOC services which include district/sub-district hospitals, CHCs and designated FRUs and eight 24/7 Primary Health Centres which provides BEmOC in six administrative regions of Gujarat (Table 7).

In most facilities key technical guidelines like IPHS standards, guidelines of MoHFW were not available. The IIM team shared relevant guidelines with various facilities as and when possible.

Region/District	DH (7)	SDH (5)	FRU (3)	CHC (4)	24/7 PHC (8)
Ahmedabad/ Kheda	Nadiad	Kheda		Matar	Alindra, Radu
Bhavnagar/ Amreli	Amreli	Lathi, Savarkundla			Chavan
Vadodara/ Dahod	Dahod		Jhalod	Piplod	Bordikhud
Rajkot/Rajkot	Padmakunwarba Hospital (Rajkot City)	Upleta		Jetpur	Kuvadva
Gandhinagar/ Palanpur/ Patan	Palanpur Patan	Deesa	Tharad		Juna Dessa, Zerda
Surat/Valsad	Valsad		Bhilad	Nanoponda	Sanjan

3.1. General Physical Infrastructure

The observations related to physical infrastructure covered the general condition of the building and surroundings, maintenance and repair, general cleanliness, facilities such as water, electricity and telephone, and bio-medical waste management systems. The observations about transport are included under the discussion about referral system.

Poor quality infrastructure in government hospitals and health centres leads to poor quality of services, patient safety and wastage of resources. As a consequence the poor suffer the most as they do not have many choices. Many times infrastructure planning (location, layout and maintenance) is left to engineers, who have limited knowledge about the specific requirements for hospitals. For example the facility of an attached toilet to the labour room or a pre-specified new-born baby corner inside the labour room, directly influences the quality of services and patient comfort. Similarly the general maintenance and cleanliness of the facilities influences the infection rate and hence quality of services.

Standards of general infrastructure, equipment, logistical and administrative support differs according to the level of health facility. Higher level facilities e.g. District and Sub district hospitals and Community Health Centres tend to have more adequate infrastructure, equipment and trained staff than do primary health centres and sub centres. The common problem seen in most of the centres was lack of proper design and poor quality of construction. This resulted into dampness in the walls due to lack of water proof construction which resulted in flaking paint, peeling plaster from ceilings and walls, leaking roofs, cracked walls and floor and fungal growth on the walls especially in the monsoon season. Doors and windows are not designed to provide adequate privacy to the women patients. In several hospitals location of the ward, OT and Labor room are not next to each other and hence make it inconvenient to transport patients in emergency from one place to other.

3.1.1. Repair, Maintenance and Renovation

Many buildings visited are old and needed substantial repair and renovation. Some buildings were also damaged due to earth quake in 2001. Lately the Gujarat government is investing on improving the hospital buildings. The delays in repairs have been overcome by giving flexible funds to the facilities to get work done locally without going through the Public Works Department (PWD). Almost all facilities reported recent renovation or there was renovation going on during the team's visit. The CDMO/MS reported that funds for renovations such as renovating the OT or the labour room are available from the NRHM/RCH funds. Minor repairs are carried out from funds from the Rogi Kalyan Samiti (RKS). Unfortunately the state does not have any standard architectural designs and norms for repair and renovation of old buildings and hence each hospital is taking up its own repair and renovation as per local need and understanding. The root cause of this problem is that the Health department does not have hospital architects. This is because there is no priority for repair, maintenance and renovation. There is no system for the same. It is all done on adhoc basis.

3.1.2. General Cleanliness of the Facility

General cleanliness seemed to be an issue in majority of the facilities because of various reasons which have been discussed for each level and type of facilities. Most facilities had dusty floors, cobwebs on the walls and unclean toilets in spite of running water. The root cause of this problem is that there are no sanitation and cleanliness standards or systems. In most of the facilities the managers are not supervising cleanliness as a routine. Wherever managers have taken interest such as the Nadiad civil hospital cleanliness is better maintained.

Almost all facilities had condemned furniture piled in corners of the corridors, in unused rooms or in the compound reducing the working space. This gave an unkempt look providing place for dust to accumulate in spite of efforts to keep the surroundings clean. The government procedure for condemnation of any article is long drawn. Disposal of old condemned items is also not a priority.

3.1.3. Bio Medical Waste and Other Waste Disposal

For waste disposal most of the district hospitals (DH) had red, green and yellow drums for segregating hazardous waste as per recent bio-medical waste disposal rules. The government has entered into a contract with a private agency which gets waste collected twice a week from district hospitals and CHCs. SDH Deesa had an incinerator. The staff seemed to be

aware of the significance of the different colours of drums. However, PHCs do not have proper waste disposal system. It was observed that the bio-medical waste materials like placenta and other fluids etc are disposed off in earth pits dug in the PHC compound. Because they are not properly dug and protected pits, dogs and other stray animals scatter the waste all around.

3.1.4. Observations from the District Hospitals

3.1.4.1. Buildings and Surroundings

Almost all the district hospitals are well located within the town and easily accessible by all weather roads. Out of the seven district hospitals visited four were working out from modern buildings (Nadiad, Valsad, Amreli, and Patan). In district hospitals of Nadiad, Valsad, and Patan had all services under one roof which makes the flow of patients much easier and organised. However in DH Patan the labour room and PP unit were located in separate building across the busy road from the main hospital. The building itself was dilapidated.

In Nadiad the labour room was located in the first floor, but it has a working lift which is used for patient transfer. It was also observed that in Nadiad hospital the stretchers are kept ready at the entrance near the casualty making it easier for staff to transfer patients during emergency

The other three hospitals (Padmakunwarba- Rajkot, Dahod, and Palanpur) were operating from very old buildings donated by erstwhile kings of the pre-independence era. Hence, these buildings have special architecture & designs. For example they have very tall doors, high roofs and hospital wards are scattered in a large compound in separate cottage like structures. These old buildings are difficult to maintain and also make the patient flow haphazard. For example the Palanpur district hospital is still runs in 125 years old building, which was donated by the Nawab of Palanpur (Figure 1). The Operation theatre and the labour room are located on the first floor. It is difficult to install a lift in this old double storied building. This means that a woman in labour will have to either climb the stairs or is carried by her relatives on a stretcher through the staircase.



Figure 1: Entrance of Palanpur Civil Hospital

All the district hospitals have proper compound walls and gates, though the gates are not manned; because of this reason stray dogs and cows were a common sight in the hospital campuses. This issue of stray animals does not seem to be of priority of the managers. Only two out of seven district hospitals visited have a clean campus, OPD wards, Labor room and OT. District hospitals Palanpur, Dahod and Amreli though have their labour rooms and OT clean but do not have clean campus, OPD area and wards. The District hospitals now have the flexibility of hiring extra contractual staff for cleanliness through the RKS funds. Yet this flexibility is used by only a few hospital administrators (See Box-1). The State has not regularly invested funds in upgrading district hospitals and their maintenance, but this initiative was started after the earthquake when state received funds for maintenance from national and international donations. At district hospital Patan, the main hospital building was getting renovated out of funds from European commission at the time of our visit.

BOX 1. Examples of Good Practices observed in District hospitals

Nadiad DH was rated the best performing in general cleanliness by our team. Cleanliness was high priority to the Superintendent/CDMO of this hospital (Figure 2). The hospital has 11 cleaners or 'safai karamchari' well equipped with complete sets of mops and cleaners posted exclusively to clean and mop the OPD area, clinics, wards, toilets twice a day, after morning and evening OPD. These facilities have the regular sanctioned posts of sweepers and also extra contractual staff to clean the facility from the RKS budget.

District Hospital Valsad had wet mopping done after each OPD session and there are dustbins and instructions in local language to maintain cleanliness in the facility. The building is in good condition and is been recently renovated with the RCH II funds. The cabin of Superintendent/CDMO is renovated and it has a corporate look. The Superintendent/CDMO informed the team that this renovation happened after the visit of the state health commissioner. There are adequate chairs in the OPD area for the patients and their relatives.

At DH Dahod and Valsad the nursing station near the labour room had a separate telephone connection. The emergency contact numbers of private specialists were pasted on the wall of the labor room for the use of Staff nurses and patients. Dahod district hospital is the only facility which maintains a referral register for both in and out cases. The hospital administrator took the initiative for maintaining a referral register, and with his personal interest he gets feedback for the cases which are referred out from the hospital.



Figure 2: Clean corridors, OPD area Nadiad Civil Hospital

3.1.4.2. *Repair, Maintenance and Renovation*

In some facilities repair and renovation are done with the funds from NRHM/RCH II and RKS. It is not clear if this is on top of the regular funds to be provided by state government for maintenance, or this is just replacing the state government's maintenance money. Palanpur district hospital which is working out from very old building will be renovated soon as the hospital is going under public private partnership. It was observed that some hospital renovation takes a lot of time- sometimes more than a year, affecting the routine services of the hospital. Better planning for alternate space could help in maintaining continuity of services during the period of repair. Though RCH funds are available for renovating and developing the labour room there are no guidelines given for appropriate design of facilities for efficient service delivery. For example in Dahod DH a big hall was made into two separate labour rooms by using a partition but there was no hand wash area in one of the labor room. Running water was available only in one of the room. Facility managers had planned to put two labour tables in each room but there was only one platform making it inconvenient for accessing equipments laid out in trays and drums in case both the tables have patients. Better planning and involvement of hospital architect can improve the design of the facility and quality of infrastructure during the process of renovation.

3.1.4.3. *Utilities (water, electricity.)*

All DHs have tap water facility for 24 hours. They have overhead tanks and pump facility for lifting water into overhead tanks. All DHs have supply of electricity with generator back up for Laboratory, OT and labour room and the hospital staff reported that the generators were in working condition. All DHs had working telephone facility most of them have more than one connection. For example in DH Dahod there was separate connection for the nursing station near labor room. All DHs except Amreli have proper sewerage facility.

3.1.5. Observations from the FRU/SDH/CHC

3.1.5.1. Building and surroundings

Out of the 5 SDH visited 2 were (Deesa SDH, Kheda SDH) old donated buildings having different cottages for various departments spread across a large campus. These had similar problems as the old district hospitals.

Two designated FRUs (Jhalod in Dahod district and Bhilad in Valsad district) had old buildings. Bhilad was earlier a sub-district hospital and now was designated as FRU. It has a huge campus bigger than the district hospital at Valsad. Tharad in Patan district which is the designated FRU had a modern building which has been renovated recently with funds from European commission donated following earth quake in 2001. This building is properly maintained.

From the 4 CHCs visited, Piplod had a modern building and very well maintained compound with a flourishing garden. Two of the CHCs Nanaponda in Valsad district and Matar from Kheda district were upgraded from PHCs are still working in the PHC building which are small and old. Some of the good practices observed in the CHCs and FRUs are listed in Box 2. CHC Matar (Kheda district) is located in a flood prone area and in spite of annual renovations it has leaking roofs, peeling plasters and damp walls with fungal growth (Figure 3). As the CHC is located in a low lying area, the compound gets flooded during monsoon, which makes the facility inaccessible for many days in the monsoon period. This stagnant water also leads to mosquitoes breeding causing vector borne diseases like Malaria, Dengue and Chikungunya in neighbourhood of the CHC.



Figure 3: Labor room Matar CHC (Kheda District)

BOX 2 : Examples of Good Practices observed in the Community Health Centres

CHC Nanoponda: The in-charge superintendent has taken initiative to use RCH funds to renovate the old PHC building. The CHC was upgraded from the old PHC, so there are many constraints in terms of number of beds, labour room, waiting area for the patients, running water problem etc. He has managed to convert an old store room to a labour room (Figure 4) which directly leads to OT. The corridor adjacent to the labor room is converted in to a small waiting room of the pregnant women in their 1st stage of labor. Availability of water was an issue in the CHC, because of his constant efforts he managed to get water connection through some local arrangements. The unused sterilization equipment from nearby non functional PHCs and CHCs were brought to this CHC because the patient load in this facility was high. Similarly medicines and drugs are also pooled from other facilities with less workload. This hospital keeps proper documents.

CHC Piplod: The in-charge superintendent of the CHC because of the personal interest had made flourishing garden in the campus. With the help of local donations she had made racks in the pharmacy and laboratory for keeping drugs, medicines and other things (Figure 5). Governmental guidelines were followed for renovation of OT. Water cooler for the patient and relatives is been installed with the funds from local donors. .



Figure 4: Well organised labor room – Nanoponda CHC (Valsad District)



Figure 5: Drugs and other supplies arranged neatly in racks, Piplod CHC (Dahod CHC)

3.1.5.2. *Repair, maintenance and Renovation*

There are many sources of funds under various central/state government schemes like NRHM, post earthquake EC/GoG funds, RKS funds which the facilities were using for renovations. The SDH get 1.5 lakh and CHCs get Rs.1 lakh under RKS per year. At Piplod CHC the LR and the OT was getting renovated using money from local donors. The Jetpur CHC and SDH Lathi were scheduled to have renovation by mid 2008 through RCH grants. At SDH Kheda, SDH Deesa, CHC Nanaponda of Valsad district renovations were carried out by using RCH money. At the time of visit Tharad CHC had recently undergone renovation using RKS, EC and RCH funds.

3.1.5.3. *Utilities (water, electricity)*

All facilities have regular supply of electricity with generator back up for Laboratory and OT. But there was no generator, invertors or emergency lamps available for labour rooms. The staff nurses at Jhalod, Deesa and Piplod explained that they have to use a candle in case of power failure. Two sub-district hospitals Kheda and Upleta had big emergency lamps in the labour room. All facilities had telephone connections. All SDH/FRU/CHCs have tap water facility with overhead tanks and pump facility. Some of the best practices seen at CHC Matar and Lathi, water cooler has been donated by local philanthropist for the use of patients.

3.1.6. **Observations from the Primary Health Centres**

3.1.6.1. *Buildings and Surroundings*

All the eight PHCs visited are although located in the interior of the villages but are well connected. The buildings are not more than 20-30 years old, yet most of them need major renovations, because of bad quality of construction at many places and poor maintenance. PHCs had a major problem of cleanliness. Only two PHCs had fulltime sweepers. The government of Gujarat has discontinued posting of regular full time sweepers in PHCs. The

funds sanctioned to hire contractual cleaners have also been reduced to Rs 400 (as reported by Medical Officer of Chavan PHC). It is difficult to hire cleaners at this rate leaving the MO with limited options. At many places it was reported that money was contributed by the PHC staff to get the premises cleaned. Six out of eight PHCs had some local person coming for 2 hours a day or twice a week for cleaning the premises which is not enough. This also affects the motivation of the ANMs and staff nurses to conduct deliveries because there is a lot of cleaning required after a delivery there is no separate provision for this. PHC Juna Deesa (Figure 6), PHC Zerda, PHC Kuvadva had hazardous waste like used syringes, cotton, gauge pieces, needles and blood slides littered in the compound.



Figure 6: Scattered Sharps, Needles in Juna Deesa PHC compound

3.1.6.2. *Repair and Renovation*

Since 2006, each PHC gets Rs.25, 000 as untied funds and Rs.50, 000 as annual maintenance funds from NRHM/RCH-II which are being utilized for renovation. Out of 8 PHCs, Chavan, Juna Deesa and Sanjan were in the process of repair. At PHC Juna Deesa, the renovation has lasted for more than 2 years and is still ongoing. The reason reported was that the contractors who are doing the job were on leave for long periods. The services of this PHC are grossly underutilized because of the renovation. Most of the PHCs visited did not have proper boundary walls with gates for safety and keeping away stray animals.

To conclude the PHCs buildings are in need of major renovations and repair because in the past they did not have adequate funds for repair and maintenance. They also have inadequate funds for hiring staff for cleaning services which is a major obstacle in delivery services. Bio-medical waste disposal rules are also not implemented in PHCs.

3.1.6.3. *Utilities*

Most of the PHCs have tap water facility with underground tanks. At Juna Deesa, it was reported that as renovation is going on for over two years, the inlet and outlet water pipes are clogged. They have to pull water by rope and bucket from a partially covered underground

well. All facilities have regular supply of electricity, but inverters were available only at two PHCs (Radu and Alindra) for the MOs office.

3.1.7. General Conclusions for Infrastructure of the EmOC facilities

District hospitals on the whole had good physical infrastructure. There was reorganization of PHCs and CHCs- some CHCs were upgraded from PHCs like CHC Matar and CHC Nanoponda and some very old district hospitals like Kheda which was a district hospital was made into sub-district hospital. This reorganization creates infrastructure constraints because many old buildings are difficult to upgrade. PHCs had the weakest infrastructure.

Renovations have been taken up on a large scale because of earthquake funds. Renovations have become easier because now decision making and funds have been decentralized. The accounting procedures have also been simplified. However though there are standard guidelines available for the construction of labour room and operation theatres as given in the national RCH-II PIP as well as on the websites of Averting Maternal Death and Disability, the facility administrators were not aware of these and therefore these guidelines were not followed. The facility superintendents were responsible to redesign these areas which many times were not as per requirements. Since renovations often take several months, steps need to be taken to minimize the interruptions in services.

General cleanliness of the hospitals is very important for preventing infections and improving the patient satisfaction. Cleanliness of toilets is an issue in most of the facilities in spite of the availability of running water and in spite of good infrastructure in case of district hospitals. The main reasons seems to be inadequate financial provisions, the lack of supervision by managers and the failure to use the flexible funds to arrange for staff for cleaning. However there are cases where the leadership has made a difference. The superintendents' initiative in some hospitals has been successful in creating clean hospitals.

3.2. Labour room facilities

3.2.1. Standards and norms

For the labour room the study assessed multiple parameters including location, the infrastructure inside the labour room such as hand washing facility, toilets, baby care corner, natural light and ventilation, waste disposal facility, the equipment and supplies such as the delivery tables, delivery kit and EmOC drugs, oxygen supply, weighing scales, resuscitation equipments etc. The government guidelines for FRU and the guidelines for 24/7 PHCs have given specifications for equipment and supplies for such facilities⁽¹¹⁾. In the RCH II PIP of government of India the guidelines for typical labor room is specified. These include size and layout of the labour room (septic and aseptic), toilets, buffer area and dirty utility room (see in annex 2). Hand wash area should be located in the labor room. This is mentioned in all the governmental guidelines. Attached toilets are also required for privacy and convenience of the women in labor. Both of these are necessary for keeping labor room environment clean and sterile. The other literature reviewed were article on repair and renovation of OT published in International Journal of Obstetrics and Gynaecology and AMDD tool for assessing the readiness of a facility in providing EmOC services⁽¹²⁾. For this study we reviewed the facilities keeping these guidelines in mind.

For a facility to provide 24/7 EmOC services the labour room has to be conveniently located. It should be on the ground floor preferably or there should be a lift or ramp for the patients.

The location of OT in relation to the labour room also plays an important role in effective CEmOC services. Easy access of OT from LR is ideal.

On review of all national guidelines there was little mention about maintaining privacy at the labor room. Only in the guidelines for Operationalizing 24/7 delivery and newborn care mention that privacy should be maintained during the examination of the female patients.

3.2.2. General observations

All the facilities visited had a specific room designated as labour room; however none of them met the design, layout and other specifications of typical labor room given in the RCH-II PIP (Annex-2). None of the places had a separate septic labor room. Most of the LR's had reasonable level of light (artificial or natural). But many LR's did not have focussed surgical lighting. Many LRs at the PHC level and at a few CHCs were small, cramped and dingy rooms with no cross ventilation for fresh air. The table 8 gives the details of labour room facilities for DH, SDHs, FRUs, CHCs and PHCs. The Labour rooms located in old buildings were not well maintained needing fresh paint, repair of windows, and doors etc.

Facility (N)	Location convenient for women in labor	Delivery Table		Adequate light & ventilation	Oxygen supply	Baby receiving corner	Attached toilets	Wash basin with running water
		With only rubber sheet	Both rubber sheet and mattress					
DH (7)	4	7	4	6	5	6	4	6
SDH (5)	4	5	4	3	4	3	5	5
FRU (3)	3	1	1	2	3	3	2	3
CHC (4)	4	4	3	4	4	4	3	4
PHC (8)	8	5	2	4	2	4	4	8
Total (27)	23	22	14	19	18	20	18	26

3.2.3. Equipment

The IPHS and FRU guidelines make a mention of labour table as essential equipment in the labour room but they do not mention any further specifications for the labor table. Ideally the labor table should have foam mattress and rubber sheet so that the foam does not get soaked in blood and fluid during the delivery. All the facilities had delivery tables but many had only mattresses or only rubber sheets. Only 14 out of 27 facilities visited had both. In most of the facilities it is a practice to take the woman in labor straight on the labour table even in the first stage of labor as there is no waiting ward/room attached to the LR. As the women have to lie in lithotomic position for long hours, just a rubber sheet on the labour table gets very uncomfortable for the women.

In most of the district hospitals the equipment, delivery tray are autoclaved regularly. In some of the facilities visited for eg: DH in Dahod the sister-in-charge explained that every day about 3-4 delivery trays are autoclaved and if there are more deliveries then the equipment is washed in the salvon solution and used, which is not a good practice. This is the case with most facilities with high delivery loads. Some facilities have only one small autoclave which requires multiple batches to be autoclaved.

3.2.4. *EmOC drugs and kits*

Most of the LR staff was aware of the use of necessary EmOC drugs like oxytocin, antibiotics etc and delivery kit/ Mamta kits in case of PHCs. However at six facilities (1/7 DH, 2/12 CHC and 3/8 PHC) the delivery tray with instruments were not ready at the time of visit. This indicated lack of readiness for dealing with emergency. Irrespective of the case load each CHCs have a fixed budget for drugs- they get 70% of the drugs from Central Medical Stores Organization (CMSO) and 30% drugs can be purchased through rate contract. The superintendent of the Tharad CHC reported that since they have very high OPD and also high number of deliveries in a month, they exhaust their drug supply sooner than others. In which case, they have to prescribe drugs to be purchased by the patient from their pockets. There is a system where unused drugs can be transferred from CHCs where there is less workload to the CHCs which need them but this involves a lot of documentation and communication causing delay.

3.2.5. *Availability of blood*

Access to blood is very important to treat maternal complications, more so in a country like India where anaemia is common. There are 167 blood banks in Gujarat which include the government, Red Cross, private, and trust blood banks. Only 29 are run by government while 71 are private. The government mapped FRUs and blood storage units showing that there are only two blood storage units available for the whole of Gujarat as of 1st February 2008. By the end of February the government plans to set up 30 more blood storage units. The responsibility of blood collection and distribution is given to the State AIDS Control centre of Gujarat (GSACs) which has been setup by National AIDS Control Organization (NACO). Drug controller has very stringent rules and specifications for blood banks and blood storage units, which affects the access and wider availability of blood especially in rural areas. Access to blood in rural areas of India is very difficult due to continued neglect of the blood banking services by the government in the past. Secondly due to high level of illiteracy, poverty and superstition, very few people are ready to donate blood in rural India. As most of the donations in public hospitals are replacement donations at rural level, the donor has no previous registration and there is no system to record his previous history. Fortunately in urban Gujarat the situation of availability of blood is somewhat better.

3.2.6. *Quality of services in labour room: Standards of practice*

The quality of care differed from facility to facility. Giving episiotomy to women with their first child was a common practice followed by the Medical Officers and Obstetricians. This is against the evidence based medical practice. In some facilities the newborn was given a bath while in some the baby was wiped clean. The baby was wrapped in dirty clothes provided by the relatives of the mother for eg in one facility the mother's shawl which she was wearing while working on the construction site, was used to wrap the baby. The money collected from the Rogi Kalyan Samiti was not used to arrange for clean baby wraps except in the Piplod

CHC. The Medical Officer of this CHC had used the RKS funds to present every mother with a baby kit after birth.

Use of partograph was an integral part for the CEmOC and BEmOC training of doctors and nurses; however it is not practiced any where. The argument given is that the women come in when they are about to deliver. Only one district hospital, since it was the clinical training site for the SBA training reported plotting the partograph.

There is no common standard clinical practice followed. In some facilities the women were kept under observation for at least a day after delivery but in most facilities they were discharged within 4 hours post partum. The women did not occupy a bed and therefore were not entered in the indoor register in most of the facilities. They were discharged directly from labor room. New born babies are not registered separately.

It seems from our observations and our discussions with the peons and Ayahs; many times the normal labour is managed by them and not the nurse or the doctor. This is especially true during the night. We observed that patients who are in the 1st stage of labour are left in the observation of the Ayahs or many times they are left unattended. In one of the facilities, the peon was very proud to explain how he conducts the delivery and takes care of the newborn baby.

3.2.7. Observations from District Hospitals

3.2.7.1. Location of Labour room

As seen in table-6, 4 DHs had convenient LR locations that are they were on the ground floor while 3 had LR at inconvenient locations (Patan, Palanpur and Nadiad). In two hospitals they were situated on the first floor, out of which one had no facility of lift or ramp to reach the maternity section, which means that a pregnant woman would either have to walk or be carried on a chair by her relatives through the staircase. The DH Patan had two sections to the hospital one new and one old with a busy road dividing the two sections. The labour room and maternity ward were in the old section while the OPD and the operation theatre were in the new section. This meant that the woman registers in the new building and delivers in the old and in case of complications she has to be transferred to the OT in the new section across a busy road.

District hospital Dahod is the only facility which has a dedicated OT for obstetric cases. All the other facilities though have more than one OT but none of them are dedicated to obstetric emergencies. Dahod also has a well equipped nurse station with a functional telephone line with emergency numbers readily accessible just outside the labour room. In the Rajkot District hospital (which is a clinical training site for CEmOC and BEmOC trainings) the OT is on the first floor and the LR on the ground floor.

3.2.7.2. Hand Wash Area and Attached Toilets in LR

All except two district hospitals had labour rooms with attached toilets. Two of the DHs (Dahod and Valsad) do not have attached toilets though the toilets are not very far away. All the DHs except Patan had hand washing area inside the LR with running water facility. However in many the drain pipes were clogged or missing as a result dirty water spilled out in the open gutter. Though the Patan DH had an overhead tank and water facility 24/7, the labour room was not connected to the tank at the time of visit. The superintendent of Patan

DH said it will be done shortly. The district hospital Valsad had a separate room which is used as scrub and hand wash area.

3.2.7.3. *Privacy*

DHs followed privacy protocols with windows and doors in the LR covered with curtain or windows placed above eye level. However, at DH Padmakubarba which is also the clinical training site for CEmOC and BEmOC, there was a high delivery load with limited staff nurses to manage the cases. It was difficult for them to monitor the progress of labour attend the delivery and at the same time maintain registers and fill forms. For convenience of the staff, the delivery tables were made to lie parallel to each other, without curtains so that the nurse on duty could monitor dilatation of all cases at the same time and do other administrative work as well compromising privacy between two patients.

3.2.7.4. *Equipment and Supplies*

Five out of seven district hospitals had stainless steel labour tables with both rubber sheet and foam mattresses which is an example of good practice. The labour table in DH Palanpur was rusted, needing repainting. At DH Dahod, the LR is undergoing renovation; meanwhile the deliveries are conducted in the makeshift LR. The labour table at the time of visit was rusted and needs replacement which was already planned by the superintendent. Five out of seven DH had functional oxygen cylinders for emergencies. One district hospital namely Valsad DH had central oxygen supply (piped O₂ supply). Most of the DH had adequate supply of delivery instruments like scissors, forceps, specula etc. The instruments were kept in Savlon solution at most of the places (not an ideal practice). Overall it was noticed that at facilities where a gynaecologist or EmOC trained MO was posted, the labour room were better managed with EmOC drugs, delivery kits and hand gloves labelled, arranged and sterilized.

Six out of seven DH had separate newborn corners with weighing machine, baby receiving tray, baby resuscitation pump (ambubag) and some basic linen. Most DH had all the necessary NICU equipment but this was unutilized. In two district hospitals there were many baby warmers and incubators given through the ORET project, packed and stacked in the female ward un-utilized. The common reason given for unused neonatal care equipment was there is no fulltime paediatrician.

Bio medical engineer from RDD office checks the non-working equipment, if he is unable to repair the equipment it will be taken to the regional headquarters for repair. For ORET project equipment they are under service contract with the Philips, so the service is not a problem. Small maintenance can be done through RKS money, but to use large amount permission from the collector has to be sought and which is a bottleneck.

3.2.7.5. *Availability of Blood*

Only Three (Patan, Valsad and Palanpur) out of seven DHs had blood bank run in the hospital campus. However, none of them worked 24X7. Only Patan and Palanpur DHs, had separate records available for blood transfusion cases. The information is only available on in the case sheet of the patient. In rural areas, only whole blood can be administered. Patan DH had a well equipped blood bank and it used to conduct blood donation camps. But when the extra blood bags were sent to Ahmedabad Civil, they refused to use this blood as they said the blood may not be properly tested. Hence the management stopped conducting the blood camps. In Nadiad and Amreli district hospitals the officials informed that only blood bank

available in the near the hospital is run by Red Cross which not working on 24/7 basis. Charges for one unit of blood is Rs 400/- for conducting tests, which the BPL patients find difficult to spend. The Red Cross blood bank will be open till 6 pm only; in case of emergency the technician will be called. In Dahod district hospital campus Red Cross blood bank will be set up in near future.

3.2.7.6. *Cleanliness and Aseptic precautions*

Aseptic precautions in the labour rooms were not properly maintained. Universal precaution for infection prevention was not strictly adhered to. The labour room was not clean in most of the places. Mosquito breeding was observed in one of the district hospital (Patan). Some exception to this is district hospital Nadiad and Valsad, where the labour room was cleaned after each delivery. During the time of visit to the district hospitals of Nadiad and Valsad the team observed that the sweepers who were cleaning the labour room were wearing gloves. No systematic protocol is followed after each delivery for cleaning the LR. The team observed in Palanpur district hospital the staffs nurses and attendees are observing good hand-washing practice.

There is a quality assurance team in place in the Dahod district hospital but which is not much active. The team consists of CDMO, Matron, Pathologist, and full time surgeon. The main duty of this team is to monitor the quality of services provided in the facility like - infection rate at the OT - which is done by the pathologist by collecting the swabs and which are send to the Baroda medical college. Though this activity is done regularly as reported by the medical officer but the findings are not documented.

3.2.8. Observations from the CHC/SDH/FRUs

3.2.8.1. *Location of Labour room*

In majority of the facilities the team found there was a need for some reorganization and better planning for labour rooms and OT. Several examples are discussed here. All the CHCs and sub district hospitals had LR situated at the ground floor except for the Upleta Sub District hospital, in which the LR was on the first floor with no lift or ramp. In Deesa sub district hospital though the labour room is on the ground floor the OT is situated on the other side of the hospital campus. The patient would have to be wheeled across the open hospital compound to be taken to the OT. In CHC Jetpur, Piplod and Matar the LR is on the ground floor but located in the interiors of the facility which is inconvenient for the patients.

In the Kheda sub district hospital the labour room and the OT are located almost adjacent to each other which is convenient. In Zalod CHC the LR is on the ground floor, easily accessible but the door of labour ward opens into the busy BHO office, which is located in the same campus of the CHC. The OT complex is located in a separate building. There is a open passage connecting the OT and LR but this has been unused for long. It is littered with waste. For emergency C-section the patient has to be wheeled to the OT by passing through the labour ward, nursing station and general area.

3.2.8.2. *Hand Wash Area and Attached Toilets in LR*

Two CHCs (Zalod and Piplod) do not have toilets attached to the LR however they are not very far from the LR. In Zalod there is a common toilet for the female ward and patients in labour. In Piplod, the toilet is situated adjacent to the LR. Cleanliness is an issue both in the

LR and toilets in almost all the facilities except the Piplod CHC. The foul smell from the labour room attracted stray dogs, cats and insects. This was observed in 5 places. In most of the facilities, the drain pipes were either blocked or broken, spilling the dirty water on the floor. In the Zalod CHC which is a FRU we observed mosquito larvae breeding in the stagnant water leaking out of the broken pipes.

3.2.8.3. *Equipment and Supplies*

Ten out of 12 places had rubber sheet on the labor table and 7 had foam mattresses. Tharad FRU has good workload; however the labour table had no rubber sheet or foam mattress on the delivery tables. The LR in CHCs are equipped with required delivery kits, instruments and equipment, however, most of the instruments like forceps, scissors and specula's are old and need to be replaced. Eleven out of twelve CHCs have oxygen cylinder available at the labour room; however their functioning is an issue.

3.2.8.4. *Availability of blood*

The new government regulation (GR) for allowing blood storage units was passed in December 2001. As per the guidelines for FRUs, having a functional blood storage unit in the facility, is one of the criteria. However, none of the SDHs, CHCs or FRUs visited during the study had functional blood storage units. In two sub district hospitals (Bhilad, Deesa) and one FRU (Tharad) blood was available either through Red Cross empanelment or by some private blood bank within an hour of need (as reported to the team by the Lab technician and facility superintendent). In sub-district hospital Deesa the government has leased out a building in the hospital campus to Red Cross to set up their blood bank making it easily available in emergency. At FRU Zalod the patient has to be referred to DH Dahod because there is no private blood bank near the facility. At FRU Tharad, there is private blood bank available just across the road. It is running in a private hospital, recently opened by the previous Medical Superintendent of the facility. During the discussions, Kheda hospital-in-charges mentioned that they have applied for the blood storage unit license for over a year and they are awaiting license clearance to get the blood storage functional.

3.2.8.5. *Cleanliness and Aseptic precautions*

It was observed that the majority of the labor room floors and labor tables have splashes of dried blood. It was also observed that the waste bucket under the labor table is not properly placed causing blood and other fluids splashed on the ground. In Sub-district hospital Deesa the labor room floors are not cleaned or disinfected with soap and other cleaning materials which leave a pungent smell. Some exception to this is CHC Nanoponda, CHC Piplod and FRU Zalod the labor room is cleaned after each and every delivery. It was interesting to note that FRU Zalod has the maximum number of deliveries happening in one month compared to all the facilities visited.

Wearing of gloves while attending to deliveries was observed everywhere but wearing gowns (plastic aprons) was not a common practice in all facilities. We happened to observe a delivery in Matar CHC in which the doctor's shirt got smeared with blood and urine. He said this is a part of the professional hazard indicating an acceptance of in-sanitary conditions and unprotected work environment.

3.2.8.6. *Privacy*

Labour room in most of the facilities visited were located at secluded areas though the doors and windows were not covered, the privacy was maintained to some extent by design, no special efforts (like shifting the labour table from the entrance, changing the position of windows from eye level to above eye level) were made to maintain privacy. LR in CHC Matar is located in the ground floor, which do not have any curtains on the windows which opens in the hospital compound and the door opens to general corridor. At SDH Deesa and FRU Tharad, the LR table was situated right across a ground floor window did not have any curtain and the window opened directly in the hospital compound. The LR staff did agree that privacy was an important psychological factor and should be maintained for the mother to feel comfortable.

3.2.9. Observations from the 24/7 PHCs

3.2.9.1. *Location of the LR*

As most of the PHCs are single story buildings, location of the labour room is not an issue. But it was noted that almost all PHCs have only one entrance and labour rooms hidden in the furthest corners of the facility. This has its advantages as well as disadvantages. The advantage is that the women have privacy being away from the OPD area but since it is almost in one corner many a times the immediate surroundings, ventilation etc is not desirable. In two PHCs labour room and ward were situated in separate buildings in the same campus. Since the labour room in the PHC Juna Deesa was under construction from the last two years the staff nurse is using her bed room in the quarters as a makeshift labour room. As the PHCs only provide BEmOC facilities the OT in PHC is used only for sterilization camps. No obstetric procedures are done in the OT.

3.2.9.2. *Hand Wash Area and Toilets in LR*

Four out of 8 PHCs had attached toilets in the LR. Cleanliness is an issue here. In Zuna Deesa which is 24/7 PHC the LR is getting renovated and the wash basin in the hand wash area do not have a proper drainage connection, so water from this wash basin is spilled around causing waste water collection in the area.

3.2.9.3. *Privacy*

Only two PHC labour rooms, out of 8 visited had LR windows and doors covered or curtains.

3.2.9.4. *Equipment and Supplies*

Three PHCs had EmOC drugs available but the drugs were either locked up in a cupboard in the ward or in the sister's room or not kept handy /in the tray in the LR. One of the staff nurses during discussion said that the drugs were locked up as she feared pilferage in her absence as she is accountable for all the drugs at ward and LR. Only two PHCs out of eight had provision of oxygen cylinder in the LR for emergency use. When asked, regarding this, one of the MO said that in most of the delivery cases, oxygen administration is not required as PHC level usually handles normal delivery cases only and most of the high risk cases are referred to higher level facilities.

3.2.9.5. *Cleanliness and Aseptic precautions*

All most all PHCs had labour room which were unhygienic, with rusted delivery tables. The labor room premises are not kept clean in two PHCs. The shortage of cleaning staff is a major problem in PHCs. The medical officer or the staff nurse in the PHC some times hires local people for cleaning.

3.2.10. **Overall Conclusions of Labour room observations**

Basic infrastructure for labour rooms seems to be in place in all facilities visited. In some district hospitals the location of the labour room is not convenient. There are no systems established for monitoring for day-to-day maintenance such as cleanliness of toilets, repair of leaking pipes, indenting for necessary supplies such as rubber sheets and mattresses for labour tables. Nurse-in-charge is not monitoring or is not given the powers to do so. DPHNs & superintendents of facility are also not paying adequate attention.

Drug supply did not seem to be a problem except in CHCs where the number of deliveries was more as CHCs have a fixed and standard drug budget irrespective of workload. Redistribution of excess drugs to facilities which have a higher need does happen but the procedure takes a lot of time. As a policy drug distribution should take into account workload of facilities so that there is minimum need for redistribution. The labour rooms in 24/7 PHCs still lack in basic infrastructure and supply of essentials such as oxygen.

Quality of labour room practices are not being monitored across all levels of facilities. Practice of aseptic precautions in terms of sterilization of labour room, use of gloves and wearing of gowns by the staff in the labour room need to be monitored regularly. Very few facilities had clinical protocols readily available. Not all practices are evidence based such as indiscriminate episiotomy, giving bath to newborns, early discharge after normal delivery etc. Partographs form a part of the training modules for CEmOC and BEmOC training but they are not used in any of the facilities.

3.3. **Human Resources**

Investment on buildings and equipment alone will not ensure EmOC services for 24 hours. From the time of CSSM (1992), it has been suggested to upgrade CHCs to FRUs to make EmOC services accessible at the periphery. RCH I (1997) and II (2002) reinforced the need to operationalize these FRUs by hiring specialists on contract, staff nurses and other staff like sweepers and drivers. However, most of the facilities do not have specialists to provide EmOC services whereas at least 2-3 doctors are required to provide 24/7, 365 days emergency services. This section has general observations for all the facilities combined.

Table 9. Staff position in the selected study facilities

	Obstetrician	Anaesthetist	Paediatrician	MO trained in EmOC	MO trained in anaesthesia	All staff nurse post filled	ANMs/ LHV's post filled
DH (7)	7 (1 posted in PPU)	8 (1 adhoc)	2 (on contractual basis)	4		2	4
SDH/FRU /CHC (12)	6	2	2	4	5	3	0
PHC (8)	Not applicable	Not applicable	Not applicable	2	-	2	7

3.3.1. Availability of Specialists at DH

Out of the seven district hospitals six had full time obstetrician and all the seven had full time anaesthetists (table-9). *However, none of the district hospital had a full time Paediatrician.* At DH Nadiad and Palanpur the Paediatrician were hired on part time basis. Out of the 7 district hospitals visited 4 had both gynaecologists and Medical Officers trained in CEmOC posted to deliver EmOC services. In Dahod DH, it was interesting to note that in addition to a full time gynaecologist who is the chief medical officer, another gynaecologist is posted at the Post Partum Unit (deputed from a nearby CHC-Devgadh Baria, Dahod District) because her husband is the District Collector (senior most IAS officer in charge of the district), posted at Dahod city. The post of gynaecologist at the CHC Devgadha Baria is lying vacant. As Nadiad district hospital has a higher workload, an additional adhoc post for anaesthetist is created and posted. According to the statistics given by the government, there are 25 district hospitals in Gujarat out of which 19 have obstetricians in place. But only one obstetrician and one anaesthetist per district hospital is too less. They cannot be on duty for 24/7 basis all throughout the year. There is no system of filling leave vacancy.

3.3.2. Availability of Specialists at CHC/SDH/FRU

In the CHCs the availability of both gynaecologist and anaesthetist is a problem. Only 6 facilities out of 12 visited had a full time obstetrician available and only 3 out of the six have been in position for 1 year or more. Only two out of 12 CHCs had a full time anaesthetist. The government is trying to resolve this problem by posting Medical Officers trained in CEmOC and Anaesthesia in these CHCs. Four of 12 CHCs had Medical Officers trained in CEmOC and an MO trained in Anaesthesia. It was interesting to note that in SDH Kheda and CHC Nanoponda there were doctor couple trained in performing anaesthesia and C-section. As a result the number of ANC and delivery cases started increasing. The performance of these trained MOs should be monitored closely as in one of the facility the superintendent reported during the discussion that the MO trained in CEmOC tend to perform risky C-sections which can increase un-necessary interventions for a normal delivery or can lead to complications. This superintendent who was an obstetrician had to deal with some such complications, caused by CEmOC trained Medical Officer.

Only one FRU and one sub-district hospital had a paediatrician in position. Most of the newborn complications are referred to private paediatricians. In the Bhilad FRU the paediatrician in place was also the superintendent in charge. He reported that he was not able to concentrate much on his clinical practice because of his administrative work.

3.3.3. Availability of Specialists and Utilization of Services

In three district hospitals (Valsad, Padmakubarva/Rajkot and Palanpur) the obstetricians have been posted for 5 or more than 5 years (Table 10). The availability of obstetrician does not ensure that the district hospital or CHC is being utilized as a comprehensive emergency obstetric care facility as seen in tables 11 & 12. Three out of 7 district hospitals with obstetricians in position had less than 50 deliveries on an average per month which is less for a district hospital. In fact one of them (Palanpur DH) have reported 15 births on an average per month and just 1% C-sections. The obstetrician said the reason for this was competition from a NGO run affordable female hospital adjoining the DH.

	Obstetrician available	In position for more than a year	Holding dual charge (Superintendent and Obgyn)
DH (n=7)	6	5	1
SDH/FRU/CHC (n=12)	6	3	5

Similarly 8 out of 12 CHCs had less than 30 births on an average per month; in fact 5 had less than 20 births a month, 3 in spite of having an obstetrician. The reasons for low utilization in the CHCs reported were lack of anaesthesia services and facility of blood. The availability of an obstetrician becomes important in case of complications requiring surgical interventions. However the normal deliveries can be taken care of by staff nurses and Medical officers easily. All the CHCs had posts of MOs filled who could attend to normal deliveries. It was not clear why the facilities were under utilized for even normal births.

As seen in the table- 10, the posting of obstetricians in CHCs have been relatively recent. Only three have been in position for 1 or more than 1 year. One other possible reason for low performance seemed to be posting the obstetrician as the facility superintendent. Five obstetricians out of 6 were the superintendents of the CHC involved in day to day administration. Two of the superintendents clearly said that administration and management took up a lot of their time which took them away from clinical work. We wonder whether there is such a great administrative load in the CHCs.

Almost all the heads of the facilities commented that their delivery workload had decreased since Chiranjeevi scheme has been launched. The Chiranjeevi Scheme and the Janani Suraksha Yojana which are being implemented for promoting institutional deliveries are monitored very closely by the state office. The team had a chance to attend one of the meetings of the Block Health Officers in one district. The District officer reviewed the performance of each block on both these schemes against targets given by the state. The Block Health Officers who had unspent money under the schemes had to give explanations and strategy to utilize funds as soon as possible.

Discussions with most of the superintendents and the District health officers revealed that there was a contradiction in government policies. In the normal course, any woman coming for third delivery has to pay Rs. 150 as a disincentive for having more than two children. Some hospitals charge Rs. 200 and 250 for 4th and 5th Gravidae. The amount is exempted if the woman agrees for sterilization. While in Chiranjeevi scheme benefit is available to all parity women. This may be another reason for reduction in number of deliveries in government institutions.

Three CHCs out of which one is a sub-district hospital report average 80-200 births per month. The reasons for this high utilization were because these were situated in under-developed remote areas with very few affordable private health facilities. Eg: Jhaload and Lathi. It is surprising that there are very few deliveries in SDH located in big towns like Kheda and Deesa.

Table-11: Service statistics of District Hospitals from January to August 2007

Level of Hospital/Location	Total Births	Average / month	Normal	LSCS	Complications	Blood Transfusion given	Staff available
DH A1 Nadiad	246	41	202	44 (18%)	145 (59%)	NA	Obgy/MO/SN
DH G 2 Palanpur	91	15	90	1 (1%)	1 (1%)	NA	Obgy/MO/SN
DH V3 Dahod	406	81	377	29 (7%)	24 (6%)	20*	Obgy/MO/SN
DH R4 Padma Kunwarba	1160	190	1087	73 (6%)	367 (32%)	17	Obgy/MO/SN
DH B5 Amreli	406	81	360	46 (11%)	0	NA	MS/MO/ SN
DH S6 Valsad	326	54	224	102 (31%)	52 (16%)	818	Obgyn/MO/SN Functions as tertiary care hospital
DH P7 Patan	346	43	283	40 (11%)	53 (15%)	NA	Obgyn/SN

*Records specify blood transfusion was for maternal emergency. MS= General Surgeon. Obgyn- Obstetrician and gynecologist

Table-12 Performance statistics of CHCs from January to August 2007

FRUs (n=8)	Total Births	Avg /month	Normal	LSCS	Complications	BT	Staff available
1. SDH Kheda	113	14	101	12 (10.6%)	1	NA	Obgyn joined in Aug /MO/SN
2. CHC Tharad	675	84	651	24 (3.6%)	-	-	MS/MO
3. SDH Deesa	87	11	85	2 (2.3%)	-	NA	Obgyn/ MO/SN
4. CHC Jhalod	1639	204	1639	0	-	-	MO/SN
5. SDH Upleta	149	18	145	4 (2.7%)	26	1*	Obgyn/SN
6. SDH Lathi	779	97	674	105 (13.5%)	105	2	Obgyn
7. SDH Savarkundla	371	46	364	7 (1.9%)	17	-	Obgyn/ANM
8. CHC Bhilad	167	21	145	22 (13.2%)	49	13*	SN/Obgyn & surgeon. Surgeon transferred
CHCs (n=4)							
9. CHC Matar (Jan-Dec 2007)	374	12	374	-	-	-	MO

FRUs (n=8)	Total Births	Avg /month	Normal	LSCS	Complications	BT	Staff available
10. CHC Piplod	98	12	98	0	2	-	BEmOC MO/SN
11. CHC Jetpur	63	8	61	2 (3.2%)	-	-	Obgyn/MO/SN
12. CHC Nanoponda	167	21	166	1 (0.6%)	22		MO/SN

No.	Name of PHC	Total deliveries	Referred in	Referred out	Staff Available
1.	Radu	58	-	7	ANM/FHW
2.	Alindra (Jan-Sept)	72	3	-	MO/FHW
3.	Juna Deesa	39	1	13	MO/SN/FHW
4.	Bordikhud	133			MO/FHW
5.	Kuvadva	126	-	-	MO/ANM/TBA
6.	Chavan	349	5		ANM/FHW
7.	Sanjan	345			FHW
8.	Zerda	23			SN

3.3.4. Alternate arrangements: Training of MBBS Doctors for Emergency Obstetric Care

In 2004 the Government of Gujarat supported by the Macarthur Foundation initiated the training of MBBS doctors for Comprehensive Emergency Obstetric Care which includes carrying out C-sections in emergencies. The training of trainers was conducted in Christian Medical College Vellore by master trainers developed by John Hopkins. The Gujarat chapter of the Federation of Obstetricians and Gynaecologists Societies of India is coordinating the training. The first batch of M.B.B.S doctors were trained in the Municipal Medical College of Surat (SMIMER). Eight batches of doctors have been trained as of June 2007.

Each batch has 8 doctors from CHCs and PHCs. The enrolment in the training is by choice. These doctors are placed in FRUs after the training. The training uses interactive and skill based methodology. The training is of 16 weeks in total, in which the initial 6 weeks are training at medical college including theoretical clarification, skill development through demonstration and practice on models and then it covers the entire component including neonatal resuscitation. The next 10 weeks trainee has to perform/ handle the task at the district level hospital independently under the trained supervisor.

After 6 weeks of training, the person is given provisional certificate by FOGSI for completion of training. After that during 10 weeks of peripheral posting at district level one of the JHPIGO trained supervisor takes a visit of the trainee and only after the supervisor is satisfied about the skills and competencies of the trainee a certificate is issued, which is a MOU certificate between ICOG (Indian College of Obstetrician and Gynecology), GOI and FOGSI. Only after this certificate is the candidate allowed practicing EmOC. However there

is no laid down criteria such as mandatory number of c-sections to be performed before certification. From discussions with the state level official handling this training and the FOGSI members coordinating the training, this strategy is useful making EmOC more accessible in rural areas but there needs to be a monitoring system put in place.

3.3.5. Availability and role of Staff nurses:

The pattern in all facilities was to have three shifts for nurses (8am-2pm, 2pm-8pm, and 8pm-8 am). In the district hospital LR and female ward there are 2 staff nurses in the day and 1 at night (8pm-8am). Almost all facilities reported that there is only one nurse available during the night who looks after all the wards including female wards and the labour room and other emergency wards. Analysis of the birth register in one of the district hospitals showed that about 40-45% of all births occur during the night. The nurses reported a lot of difficulty in coping with work when more than 2 women came in with labour during the night or when there is a serious mother or new-born and another delivery is happening. In such circumstances the Ayahs and the attendants have to conduct deliveries. During the day time also though there is staff nurse on duty, she is busy maintaining records and registers as there is no position of ward clerk. The woman on the labour table is left with the relative who calls on the Ayah if there seems to be any problem. It is also a policy to keep nurses on rotation from one ward to another. But generally the rotation is after about one year in one ward. The staff nurses trained in BEmOC services will also be put on the routine rotation of duties in the hospital loosing their skills.

It was seen that out of 1072 PHCs in the state only 848 facilities have a medical officer available in the facility ⁽⁹⁾. Marginal Shortages of ANMs at sub centre level affect maternal health services as she is the first contact person for community. Antenatal, delivery and post natal care services are affected especially in rural areas where the option for private facilities is limited. Not having doctors at PHC and specialists at FRUs and CHCs affects access to emergency obstetric care. Data on posts filled/vacant is not updated regularly and there is no monitoring of whether posted health care provider stays at the head quarters.

3.3.6. Availability and role of staff nurses in District Hospitals

The government of India norm for nurse to bed ratio is 1:5. According to this norm the average posts of staff nurses in district hospitals should be 32 for 150 beds. Some facilities had more number of beds added such as when trauma units and intensive care units are added to the hospital while the number of nurses remains the same. The same staff nurses are posted at these additional units disturbing the nurse to bed ratio. All the facilities have vacancies of nursing staff; some facilities have hired staff nurses on contract through NRHM. Only DH Valsad has all the posts of staff nurses filled.

3.3.7. Availability and role of staff nurses in CHC/SDH/FRU

As per IPHS standards for a 30 bedded CHC, it has been recommended that there should be 7+2 posts sanctioned for Staff nurse/Midwives (ANM and 1 PHN for family welfare will be appointed under NRHM-ASHA scheme). However, at most of the facilities observed, the sanctioned post of staff nurses is not filled. CHC Jetpur and FRU Zalod, SDH Deesa had the required number of staff nurses in position (table-9).

The role of the staff nurses was not consistent but in majority of the facilities they were conducting some of the normal births. The role of staff nurses was that of a record keeper and

ward manager in CHCs where there was an active Medical Officer. They played the role of a midwife only if the MO was inactive. Ideally normal deliveries should be conducted by the staff nurses and only complicated cases should be handled by the doctors/specialists.

There was inconsistency in the records of birth registers for recording birth attendant. Only a few facilities put the names of the staff nurses as birth attendants otherwise the practice was to record the name of the doctor even if the delivery was attended by the staff nurse. The issue was of accountability and responsibility. This recorded data is not reliable source of attendance at birth.

3.3.8. Role of Staff nurses and ANMs in 24/7 PHC

As per Guidelines for Operationalizing a Primary Health Centre for providing 24X7 delivery and new born care under RCH-II, Ministry of Health and Family Welfare, it is recommended to have 5 staff nurses (or ANMs, who are trained as SBA for 24/7 services).

Only two 24x7 PHC s (Juna Deesa and Alindra) out of eight PHCs visited had one staff nurse posted (on contract) with all the ANM/FHW posts filled. In the rest of the PHC s there were no Staff Nurses posted, but ANM/FHW posts were mostly filled. Most of the ANMs/FHWs expressed that their work profile is more of a multipurpose worker which leaves them little time to conduct delivery. Their weekly schedule as reported by ANMs/FHW:

- Mondays and Wednesdays – Mamta day (Immunization, ANC and TB clinics at SC)
- Tuesday and Thursday - bring women for sterilization camps which are organized at the PHCs
- Saturday –Documentation and reporting at the PHC
- Friday- field visit (house to house visit)

The FHWs cover 5000 population with multiple health programmes (MCH, FP, TB, Malaria...) leaving limited time for deliveries. Given their fixed day-fixed place schedule they cannot be available for delivery care as and when required. There is a major conflict in their prescribed role and prescribed field schedule.

During the visit to one of the PHCs, the team had a chance to interact with the Female Health Workers because there was a staff meeting. They discussed problems which were obstacles in effective service delivery. Out of six subcentres only two had their own building. One of the buildings did not have an electric meter, and therefore no electricity. One of them did not have doors so the villagers used it for other purposes. Unless all these difficulties are solved it is impossible to think of BEmOC services.

3.3.9. Availability of Support staff

General Cleanliness is an issue in all the facilities. Six out of 7 district hospitals, 6 out of 12 CHCs and 2 out of 8 PHCs have fulltime staff for cleaning. IPHS guidelines mentions about the post of 4 permanent sweepers in an FRU it is not followed. To overcome this shortage some facilities have hired staff on contract. For example in the district hospital Nadiad the CDMO has hired additional staff on contract from the RKS money in addition to the regular staff. A study carried out in the state of Maharashtra found that lack of cleaning staff was the most important reason why women did not use the PHC for childbirth. The Female Health Worker asked the relatives of the woman to clean up after delivery as she did not have any help in the PHC (Ref)

According to the guidelines of 24/7 PHC, adequate number of semi-skilled workers, especially persons trained as cleaners must also be available round the clock, working in shifts. Multi-skilled person should be preferred ⁽¹¹⁾; this person can also be a chowkidar to provide safety for the ANMs or staff nurses who are stationed at the head-quarters. It was also seen that staff hired for cleaning at the PHCs needed training on bio-medical waste management. In some PHCs it was observed that bio-waste materials like syringes, needles, cottons etc were littered in the compound itself. Similarly only in 2 DHs (Palanpur and Nadiad) and 1 CHCs (Bhilad), universal precautions like wearing gloves, masks while cleaning LR and OT were followed.

Ayas or attendants who are usually traditional birth attendants also play a major role in smooth functioning of the delivery services. There is a shortage of ayahs in PHCs, CHCs and DHs. Ayas are a great help to the staff nurse/ANM when she is conducting the normal delivery. In fact it was seen that in some facility because of the increase in work load and shortage of doctors and staff nurses, Ayas also conduct normal deliveries.

3.3.10. Overall Conclusions for Human Resources

Although there are committed efforts from the government to make skilled human resource available for EmOC, the issue seems to be availability of a “complete team” at each facility for effective and sustained service delivery.

As per the GOI norm most of the district hospitals visited had atleast one obstetrician and anaesthetist available. Although this norm is not appropriate, because one obstetrician cannot ensure 24/7 EmOC services. For example in Tamil Nadu the Comprehensive Emergency Obstetric and Newborn Care (CEmONC) facilities have three obstetricians, one anaesthetist and two paediatricians to ensure that atleast one specialist are on duty round the clock.

Availability of specialists is more difficult below the district level. However the utilization of a facility for EmOC is complex not just dependent on the availability of obstetrician and anaesthetist but on many other factors. Therefore just focusing on provision of skilled human resource may not always be the solution.

Training MBBS doctors in EmOC is a good practice showing increase in utilization of services as seen in some of the FRUs. These trained doctors could be posted with the obstetrician in District hospitals and CHC/SDH/FRUs which would increase substantially the access to EmOC services at district level and below. Putting monitoring systems in place to support these newly trained doctors would ensure sustainability of this good initiative.

There is acute shortage of staff nurses in 24/7 PHCs due to many reasons which affects their functioning. Though many of the district hospitals and CHC/SDH/FRUs have staff nurses appointed as per the norm of nurse to bed ratio, they do not take into account the extra beds added to the facility. As a result there is a shortage of nurses especially in the night. The role of staff nurses in district hospitals and CHCs is more of maintaining records and registers which is a waste of valuable skilled human resource. There are no dedicated staff nurses for maternal care.

Support staff such as Ayahs, peons and sweepers is crucial for helping the doctors and nurses during and after childbirth. There is a shortage of support staff in all facilities more so in the

24/7 PHCs which is affecting the quality of services and in case of 24/7 PHCs the service utilization.

3.4. Records/registers/checklists: DH, CHC/SDH/FRU, PHC

Though the facilities maintained many registers, here we discuss important observations regarding records related to child birth and delivery complications. There was a better system of record keeping in the District and Sub-district hospitals compared to the CHCs and PHCs. Various registers having maternal health data were birth register, ward register, MTP register, order register, OT register etc.

The Birth register maintained in the labour ward, records the personal details of the patient, and some details of the present birth- gravidae, breach, LSCS, or normal, pregnancy outcome- twins, sex of the child, stillbirths, birth weight etc. The order registers (treatment register) records information on the treatment given to each delivery patient. The registers are maintained regularly, the data is not summarized at the end of the month. For example, there is no summary column for the delivery register, to record total live births, stillbirths, male and female children. Complications of delivery are not properly recorded; one can only get information about complications from the case sheet of the patient which is a laborious process. In many of the facilities especially PHCs and CHCs standard printed registers were not available. The staff nurses had converted other old registers or prepared manual registers for record keeping. Only the Chavan PHC maintains a proper printed delivery register issued from the state government.

Although the concept of FRU is more than a decade old they had no standard system of record keeping of child births- it differed from facility to facility. All the SDH/FRU/CHC is required to fill form 8 recommend under the CSSM/RCH program on monthly basis.

There is no standard register for Blood transfusion. *At DH Patan the nurse took the initiative to convert an "Advance vasuli" register into a blood transfusion register.* This register recorded the name of the patient, quantity of blood given and source of blood – the hospital blood bank or private blood bank. There are no service or maintenance registers for all the expensive equipment or service contracts for regular maintenance of the equipment.

3.5. Registration of Maternal Deaths

Maternal deaths are reported in standard reporting formats; form numbers 6, 7, 8, 9 designed by the government of India for collecting performance statistics for the RCH programme. Reporting of maternal deaths improved after Gujarat started monitoring the same from 2005 onwards. But in Municipal Corporations and some rural areas, the reporting is poor. The verbal autopsy of maternal deaths was initiated since 2005 onwards. The verbal autopsy forms (hard copy) are to be filled up by the Block Health Officer after interviewing the family members/ neighbours of the mother. Computerized data entry of verbal autopsy is carried out at district level and sent to state level by email. The data of verbal autopsy are compiled at state level. There is no dedicated officer at the state level for monitoring the validity of these filled verbal autopsy forms.

Out of 2000-3000 expected death (based on MMR of 172/100000 live births or 1.5 times that), about 1000 births are officially reported of which about 600 death forms were filled. The reporting system still needs improvement. There is very little analysis or actions based on maternal death audits. The state has not so far produced any report on maternal deaths.

3.6. Referral System

Providing effective referral transportation in case of emergencies is an important part of EmOC. The referral system which consists of transportation, linkages between facilities in terms of communication and follow-up and effective record keeping was found to be very weak in almost all the facilities.

All district hospitals have ambulances in running condition for 24 hours as reported by the CDMOs. There is more than one vehicle available in all DHs. They also have full time drivers and also have the flexibility to hire drivers on contract. Drivers play a very important role in the EmOC services. Although all the seven DH have full time drivers, only 5 DH they were available for 24 hours. This is because of the non-availability of the drivers' living quarters.

Compared to district hospitals the CHCs/FRUs had less access to ambulances due to various reasons. . Although 9 out of 12 CHCs have full time drivers, only 5 have drivers available for 24 hours. The facilities which do not have full time drivers have made other arrangements. For example in one of the CHCs the driver is on deputation from Red Cross society and so is available only from 9 am to 5 pm. The patients have to hire a private vehicle for any referral after 5 pm (Box 3).

Out of 8 PHCs only three had a vehicle in working condition. Most of these PHCs had vehicles which were parked in the premises ready to be condemned. According to discussions with the Block Health Officers and the Medical Officers of the PHCs there is a shortage of vehicles and drivers. The vehicles are pooled between 8-10 PHCs. For example one of the blocks had 3 vehicles between 10 PHCs. However they said they have a provision to hire a vehicle during special days such as immunization day. The vehicle maintenance & POL budget for the PHC is Rs. 24,000 annually. This is highly inadequate for services in 15-30 villages. Since the PHCs come under the Rural Health section, the procedure for condemning a vehicle so that a new one can be bought is very cumbersome. A vehicle can be condemned only if it has completed 1 lakh kilometres or if it is more than 10 years old.

The availability and use of ambulances differed widely. The team checked the log book of the ambulances and found that the log book recorded only the date and kilometres travelled with general information on purpose of the visit . Only basic details of the patient were noted such as age, sex, the problem for which the patient has been referred, the charges taken. The superintendents said most of the time the ambulances are used for transferring medico-legal and orthopaedic cases to higher level facilities. There was an exception in case of one CHC (Jetpur) where obstetric patients were transferred because of unavailability of blood and anaesthetist. This facility transfers 4-5 obstetric cases to the district hospital in a month while some facilities had recorded transferring only one obstetric case a year.

There is no standard register for referral designed by the state government. Therefore except for a few facilities, who have designed their own registers such as Dahod DH and Radu PHC no other facility had any records of referral. Both these facilities maintain the register for inpatient and out patient referral. The existing system is to fill up the referral slip with two parts- one section is given to the patient to carry to the higher facility and second part is retained in the hospital. Information from the referral slip is not transferred into a register. No review and analysis of referral information is done.

BOX 3: Case Study of Emergency Referral to a Chiranjeevi gynaecologist

This incident happened during the team's visit to the Piplod CHC (Dahod District).

Bhanu is a tribal woman living in the town of Piplod about 30 kms from Dahod which is the district headquarters and 40 Kms from Devgad Baria. Bhanu came to the Piplod Community Health Centre in labour. This was her second child. The staff nurse examined her and informed the Medical Officer (MO) who also is the superintendent in charge, that Bhanu has obstructed labour transverse presentation and hand prolapse. The doctor also checked Bhanu and decided to refer her to the Chiranjeevi empanelled doctor because there are no regular or contractual gynaecologist and anaesthetist available at the CHC. The doctor feared that the lady may have to undergo blood transfusion for which the nearest blood bank inaugurated recently was in Dahod, about 30 kilometres away. The Medical Officer was in the process of constructing the operation theatre. MO was very keen to start C-sections in her facility very soon.

The MO assured the family that they could take the CHC ambulance to go to Dev Gadh Baria where the clinic of the Chiranjeevi doctor was located. However the MO had to refuse when she found out that the driver deputed from the Red Cross had left because it was over 5 pm. The regular driver's post at the CHC was vacant. Bhanu's father looked harried but sent his son immediately to arrange for a vehicle as soon as possible. The study team offered to help and take the lady to the private doctor. The MO gave the family the name and mobile number of the Chiranjeevi doctor. No referral slip was given to the patient. The patient had a Below Poverty Line card and Mamta card with her.

When we reached the doctor's clinic in IIM vehicle, which was adjacent to his home, we found the doctor's family in mourning because he had lost his son. They were having the third day "Besna" where many friends and relatives clad in white had come to console the family. He sent a message that the patient be taken to Godhara which was 40 kms from this town. We were at a loss; the family looked at us with great expectations. We did not have any information about any other doctor in the town or even the phone numbers of doctors in Godhara just to make sure services will be available if we take the risk of another hour and a half on the road.

Incidentally Devgad Baria has a CHC with the post of gynaecologist filled. She is the wife of the collector of Dahod, so she lives in Dahod and gives her services in the Dahod district hospital which already has a gynaecologist.

We were about to call the Medical Officer of Piplod for advise when a passer by who had been observing us pointed out another Chiranjeevi doctor participating in the Besna. We called him out and explained the situation to him. He also refused initially because he said he had just operated upon a woman with obstructed labour for which he had great difficulty for arranging blood. He also advised us to take her to Godhra Civil Hospital. We tried to convince the doctor and requested him to at least examine Bhanu. He agreed without much convincing. This doctor's clinic was round the corner on the first floor in a shopping arcade. The staircase was steep and narrow. There were no stretchers or wheelchair available for transferring the patients to the clinic from the ground floor, nor was there a lift. Somehow Bhanu, who was in active labour climbed the steps and lay on the examination table. Her sonogram was taken immediately. After examining the doctor agreed to admit her and begin treatment.

The doctor seemed to have a very good practice. The hospital was crowded. Most of the patients looked like tribal from surrounding villages. The woman who was ed was kept in the general ward with all other women. The doctor said she was under shock and was given oxygen; the baby was a stillborn. We left for Ahmedabad. Next day we checked with the district program coordinator about Bhanu's case and found that both the baby and the mother were safe.

This case raises questions about referral protocols, managerial issues of posting of human resource, the management of transport for referral etc. Also whether Chiranjeevi scheme is able to deal with all complicated cases or are they referred to the tertiary care facilities.

4. Management Systems

4.1. State level

Gujarat has come a long way in the economic and as well as other fields, still its maternal mortality rate remains high. The state has a population of around 51 million and birth rate of around 23.5, and estimated maternal mortality rate of 172. The state does not have a dedicated officer for maternal health and midwifery. The state government has appointed professor obstetrics as consultant for maternal health, who largely looks after training of MBBS doctors. The state also appointed one more retired obstetrician as another consultant responsible for maternal health. At some point there was deputy director looking after administrative aspects of maternal health, who has retired and that post remains vacant for some time. There has been a post of joint director MCH and additional director family welfare that are over all in-charge of maternal health. Thus there no clear responsibility for maternal health to any particular officer and there have been frequent changes of officers looking after maternal health.

The regional directorates were set up in 1986 to decentralize authority and responsibility of managing day-to-day problems at health facilities while only policy-level decisions taken at the state level.

As seen in Table-4 there were 102 FRUs identified and mapped in Gujarat out of which only 25 are operationalized. All government hospitals, including FRUs and CHCs, come under the regional directorates. However the administrative control of the FRUs (District/Sub-district hospitals and CHCs) is with Medical Services division. But Rural Health division of the Family welfare is responsible for providing maternal health services including EmOC. This seems to be one of the reasons for not being able to set up systems for making all FRUs fully functional. The funds given by GoI under RCH and NRHM for operationalizing the FRUs and training Skilled Birth Attendants both for Basic and Comprehensive emergency obstetric care are routed through the division of family welfare. Thus the department of FW has the responsibility of making FRU operational but do not have any administrative control over them.

Division of medical services has very few technical staff (3-4) and they have to look after the functioning of district hospitals, sub-district hospitals and FRUs. So the monitoring systems in the division of medical services seemed to be weaker compared to division of Family Welfare and hence operationalization of FRUs is not systematically monitored.

4.2. Regional Level

The Gujarat state is administratively divided into six health regions with 5-6 districts in a region. Each region is headed by a Regional Deputy Director (RDD). RDD is the link between the directorates of health and family welfare and medical services but it seems to be a very weak link. There are very few technical people in the RDD office. The RDD has to cover a lot of districts which becomes difficult with such few staff members. Only recently the RDD office has started receiving data from the District health offices. The RDD office has been strengthened by one Regional Project Coordinator who helps in compiling and analyzing data from the district. Hence RDDs are not able to supervise FRUs & CHCs for MH/EmOC. The RDDs are not held accountable for operationalizing FRUs. There is no maternal health consultant or public health nurse or supervising midwife at the RDD level.

During the time of our visit to the RDD office we did not find a plan or schedule of monitoring visits to CHCs. Also the CHCs we visited mentioned any supervisory visits by either the RDD.

4.3. District levels

The chief district health officer (CDHO) who comes under the division of family welfare monitors the preventive services provided to the community through PHCs and sub-centers. But monitoring of the services at the field level is weak. One of the reasons is that the district public health nurse who is supposed to monitor the field level nursing activities does not have a vehicle and hence depend on public transport. Recently government has hired on ad-hoc basis young graduates as district program coordinators (DPCs) having hospital and health management qualifications, to monitor the functioning of the PHCs and SCs. But they are not responsible for monitoring FRUs. There is no district level dedicated officer who is in-charge of maternal health or midwifery services.

The curative services are monitored by the Chief District Medical Officer (CDMO) who is the head of medical services in the district. The CDMO is responsible for monitoring the medical services provided at the district hospital, CHCs and FRUs. During the time of our visit one of the CDMO informed us that they are not able to do visits to the FRUs and CHCs because of their hectic schedule at the district hospital as the administrator and also their routine clinical practices. CDMO does not have a assisting technical officer and hence he has to single handily do management of the peripheral medical institutions and district hospitals.

It was also observed during the visit that the superintendents of CHCs/FRUs who are accountable to the directorate of medical services are not very familiar with the various guidelines issued by GoI such as the IPHS standards. It may be because the dissemination of these guidelines have happened at the state level and not communicated to the district level.

There are no fixed protocols of supervision by the district officers of the peripheral health units and hence supervision happens more on ad-hoc basis and as and when needed.

4.4. The role of the Block Health Office:

The block health office is headed by a Senior scale Medical Officer and supported by ancillary staff like one block Information Education and Communication Officer, one senior assistant cum stores keeper and one data entry operator⁽¹³⁾. The BHO is accountable to the CDHO. There are 160 Block health offices in Gujarat⁽¹⁴⁾. These offices are situated in one of the CHCs, District Hospitals or Sub district hospitals which improve the probability of coordination between the Department of Health and Family Welfare and the Medical Services.

The Block Health officer is a vital link between the PHCs and the district health office. The BHO is responsible for implementation of the National Health Programmes, new schemes (like Chiranjeevi and JSY) and also involved in monitoring processes like verbal autopsy for maternal death. The BHO facilitates supplies of medicines, vaccines and other supplies for implementation of all National Health Programmes; facilitates data flow from the primary health centres to the district. According to the Medical Officers of the PHCs and the BHOs reported that having a block office has improved logistics of supplies reducing delays. This has also improved general management such as pooling human resources, vehicles and other resources within the block.

From the discussions with the various BHOs, the team feels their role is more administrative and less technical. For example they do not analyze data received from the PHCs or provide feedback to the PHCs. They do not investigate maternal deaths or monitor the still births.

4.5. Facility level

Each facility has overall in-charge who is a medical officer or specialist doctor. He is supposed to provide clinical services as well as manage the facility. These medical officers have not undergone any long term training in management; some of them would have undergone one or two week administrative training. Out of the 27 facilities where the visits were made the facility managers informed that there is no system of conducting regular internal meetings. The meetings are conducted as and when it is required. The facility may have clerical and administrative staff some administrative help. Only two of the facilities have assistant hospital administrators.

5. Overall Conclusions and Recommendations

The establishment of functional First Referral Units for EmOC had been a strategy from the early 1990s; our study results reveal that many are not functional because of various reasons. Some of the key reasons are listed below:

- Even though the concept of FRUs was a part of the CSSM program in 1992, detailed implementation strategy and guidelines were developed only in 2003.
- The government health institutional network is fairly good, yet the infrastructure is incomplete. Especially the labor rooms in various facilities need better infrastructure.
- Staffing of EmOC centers has been neglected in the past but now the government of Gujarat is making efforts to ensure availability of trained staff. It is still inadequate at many places. The available staffs are not qualified, many a times they do not have skills for managing complications. Though there are nurse-midwives available, there is no cadre of midwives dedicated for maternal health.
- Standard evidence based clinical protocols are not followed in various service delivery facilities.
- There is limited management capacity at all levels (state, regional and district). Operationalizing FRUs is not assigned to any specific state level manager. The management and administrative control of FRUs is divided amongst two directorates in Gujarat raising issues of accountability.
- The management information system at the state level is weak. It does not capture the functioning of FRUs.
- Maternal deaths occurring both in and out of institutions are not recorded properly or monitored.

These observations and recommendations to improve EmOC services are discussed in detail.

5.1. General Physical Infrastructure and Supplies

For the last several decades physical infrastructure was neglected in the health system. Many a times the infrastructure created was of poor quality and improper design. Inadequate attention was paid to maintenance⁽¹⁵⁾. This changed after the earthquake in 2001 when the state government took up repair and renovation of health facilities on a large scale with

national and international assistance. Recently funds from the NRHM, RCH II and RKS are available and used for minor renovations and repair, which should be continued. However, the facility manager should be given more decision-making and financial powers. For example district hospital superintendent has the power to spend only up to Rs. 50,000 without approval of the collector from the RKS funds. This is a very small amount keeping in view the size of the district hospital which are roughly about 200-300 beds and provides services to population of around 1-2 million. Hence we suggest that financial powers of superintendent should be increased to Rs. 500,000 and the district hospitals should get regular maintenance budget in proportion to its size and patient load.

Cleanliness and asepsis are quite variable between facilities. Some facilities were clean, but most require improvement in cleanliness. Leadership of the facility in-charge made a difference that ensured cleanliness by employing more contractual cleaners through NRHM funds. Aseptic precautions were compromised in many facilities. Utmost priority should be given to maintenance of aseptic precautions in all the wards, operations theatres, and labour room. Specific guidelines and protocols should be developed for cleanliness and asepsis taking into account of international standards for universal precaution for body fluids. These should be assessed periodically.

It is observed that many facilities do not have proper compound walls because of which stray dogs and other animals enter the premises. Mosquito breeding, dumping garbage and hospital waste in the hospital premises was seen in some places. Basic arrangements of a compound wall, maintenance of the grounds and adequate security to prevent stray animals should be ensured. The movements of the visitors and relatives of patients should be regulated. There should be a functioning hospital waste disposal system.

5.2. Labour room facilities

Most of the facilities do not follow a standard design of labor rooms. Almost all labor rooms have basic design problems such as location of the labour tables in relation to the window and doors to provide privacy, lack of attached toilets and hand-washing facilities. Renovation of labour rooms is an opportunity to make basic improvements in its location, layout and design. A properly designed labour room can ensure safe and smooth service delivery. The facilities should be provided with technical guidelines ⁽¹⁶⁾ for renovating labour rooms instead of leaving it to the medical superintendent and PWD engineers. For example labour rooms located on the first floor without a ramp or lift, should be shifted to the ground floor for easy accessibility to the mothers. Other aspects such as attached toilets, changing the location of the labour tables to ensure privacy, curtains on the windows etc should be ensured. While renovating, the views of facility managers and the chief matron should be taken to make the facility more patient friendly. As renovations take a long time, the facilities should plan so that routine services are not disturbed.

There should be a waiting room for the women who come in the 1st stage of labour so that they do not have to lie down on the labour table for more than 3-4 hours. The waiting rooms should have beds and adequate space so that the relatives of the women are with her for emotional support. She should be shifted to the labour table only for delivery. As these waiting rooms are attached to the labour room, the nurses can monitor the cases along side other routine LR activities.

In most labor rooms service delivery protocols are unavailable. There is very little clinical monitoring of progress of labor. Evidence based practices such as partograph to monitor progress of labour and active management of the third stage of labour are not practiced. Practices such as indiscriminate episiotomy especially in case of first delivery are observed. In view of this we strongly recommend establishment of evidence based management protocols which should be supervised by clinical managers including district public health nurse, district obstetrician and RCH officer. MIS report should include the indicators for compliance with clinical protocols.

Drug supplies are inadequate for facilities with high work load. At several facilities instruments for delivery were not autoclaved and in ready condition because there was continuous flow of patients while they had limited sets of instruments. There should be a system in place which will ensure the redistribution of drugs from the facility where the workload is less to the facility where workload is comparatively high. Drug budget needs to be reviewed depending upon the workload.

Another important bottleneck for EmOC is lack of availability of blood in rural areas which needs to be addressed urgently. Blood storage units are not fully functional and no officer is responsible for ensuring availability of blood in rural areas. There are inordinate delays getting licence of blood storage units from the authorities. Even district level hospital does not have blood banking facility on 24/7 basis. Some blood banks are charging around Rs. 400 for blood which many BPL patients cannot afford to pay. The state should appoint an officer to ensure availability of blood in rural areas. MIS should set up to monitor for operationalization of blood storage units and functioning of blood banks.

5.3. Human Resources

Most of the CHCs and FRUs lack obstetricians, anaesthetist and paediatricians. Even if they are present they are not adequate in relation to the workload to provide 24/7 coverage. As part of the RCH-II/NRHM strategy the state has taken many good steps to ensure the availability of skilled professionals for EmOC, such as the training of MBBS doctors in C-section and anaesthesia. These initiatives should be continued and systems should be developed to refine and sustain them. MBBS doctors trained in C-section and Anaesthesia need periodic refresher training, close monitoring and support on the site. It is preferable to post more than one trained doctor and staff nurse trained in BEmOC at the district hospitals and FRUs to form a team who can provide CEmOC services 24/7, 365 days. The MBBS doctors should also be trained for newborn and paediatric care to fill in the gap of paediatricians. Regular training and continuing education should be given to the staff nurses and ANMs in BEmOC and essential new born care.

Almost all facilities face the problem of shortage of nursing staff. The staff nurses who are posted are over-burdened with their nursing duties and also other administrative work. While sanctioning the post of nursing staff government should take into consideration of total bed strength, number of in-patient load, and number of deliveries so that the nurse are not over-burdened and can provide good quality care to the mothers and newborn. The minimum number of nursing personnel required at a facility where both labor room and OT are functional should be as follows: 3 nurses in the morning shift (1 in OT, 1 in Labour ward, 1 in inpatient wards), 2 in evening duty (1 in ward, 1 in labour room), 2 in night shift (1 in ward, 1 in labour room), 1 as leave reserve. It is important to appoint a sister-in-charge for maternity section to co-ordinate midwifery care for the maternity section.

In a large and busy district hospital there is a need to hire additional staff such as ward clerks, multi-skilled general purpose staff who can help in maintaining registers, attending to the case window, directing and counselling patients when needed. At present these jobs are done by the staff nurses. Hiring such additional staff will free up nurses time for maternal care instead of spending their time in maintaining registers, providing general guidelines to the patients. This will also improve the documentation of the facility because there would be a dedicated person for the job. Ensuring the availability of support staff such as drivers, peons, and cleaners is crucial without which quality of care will be compromised. Some facility heads have used the RKS funds to hire support staff but many have not.

To conclude each facility should be viewed as a unit in which a team of specialists, doctors, staff nurses and non-technical support staff is available to provide 24/7 services. No staff should be transferred without ensuring immediate replacement. In large hospitals there should be dedicated midwives/nurse-midwives for maternal unit.

Human resource needs should be adequately addressed and required posts should be created on permanent basis and reflected in the state government's annual budget. The current system of hiring temporary staff on ad-hoc basis should not be continued for long as it de-motivates the staff due to lower payments and temporary appointments.

5.4. Management Information Systems for Maternal health

Our visit to the FRUs and 24/7 PHCs show that important information related to maternal health services especially emergency obstetric care is neither recorded reported or utilized for planning EmOC services. Currently one cannot comment with confidence whether the facility is really functioning as an EmOC facility or what percentages of women with complications are reaching the facility. According to the UN indicators for monitoring efficacy of EmOC one needs to assess whether the facility has performed the six signal functions during the last six months⁽²⁾.

Right now this information is not recorded in the facility. Standard printed registers for EmOC should be designed and distributed to facilities on top priority. The birth register can be revised to record details of maternal complications, treatment provided including details of blood transfusion. The staff should be given training related to these new indicators and their significance.

There is an urgent need to setup a system of monitoring maternal deaths both in the facility and in the field not only to measure maternal mortality but to learn from the deaths and improve the health system to prevent these deaths. This monitoring system needs to encourage death reporting and the investigation of death should be focussed on systems' analysis rather than blaming any particular institution or individual.

5.5. Management capacity of Operationalizing of FRUs

Our study shows that the monitoring capacity at the regional and the district levels is very limited and hence FRUs are not fully functional. Functioning of FRUs could improve if there is a dedicated officer for maternal health in the regional office who can liaison with both the directorates at state level and the CDHO and CDMO at district level. Coordination between the Directorate of Medical Services and Family Welfare should be strengthened in order to ensure proper monitoring FRUs from the state level. It would be ideal if there is a dedicated officer for maternal health and/or midwifery at the district level. This would ensure regular visits to the FRUs and day-to-day monitoring of implementation, better management of

logistics and supply of drugs and equipment, maintenance of equipment, referral transport etc. for round the clock emergency services. These functions could be supervised by the DPMU & SPMU.

Similarly there should be a separate maternal health officer/consultant in the directorate of medical services who should be responsible for operationalising FRUs. This officer should liaise with the maternal health officer/consultant in the directorate of health and family welfare. This would go a long way to improve access, and quality of EmOC services. This maternal health officer should have been trained in Public health/obgyn/midwifery.

An officer at the state level should be designated to monitor maternal deaths and should produce an annual report showing the distribution of deaths and its causes. Regular monitoring of evidence based practices in management of maternal complications and referral would indicate actual functioning of FRUs.

The utilization of government facilities (24/7 PHCs, CHCs, FRUs and district & sub-district hospitals) has reduced because of initiatives such as the Chiranjeevi Scheme, Janani Suraksha Yojana and the Emergency Transport system which attracts mothers to the private sector. Government should plan to reverse this trend.

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Annex 1

Guidelines for Operationalizing FRUs

The FRU guidelines were disseminated in 2004 by Ministry of Health and Family Welfare although the strategy to establish FRUs was initiated during the CSSM programme (1990). The guidelines provide a FRU mapping format for districts to help prepare a district and a state action plan for FRUs. The guidelines also list the critical determinants of FRUs, the various points which are to be considered while selecting a facility to be updated as an FRU. Guidelines also touch upon human resources in terms of re-deployment and multi-skilling, referral transport, functional/financial autonomy.

The minimum requirements for a FRU as recommended by GoI:

1. Minimum bed strength of 20-30
2. Functional OT for anaesthesia, laparotomies and C-section
3. Fully operational Labour room
4. Functional laboratory
5. Blood storage unit according to GoI guidelines
6. 24 hour water supply
7. Waste disposal system in place
8. Electricity with backup in OT and Labour room
9. Cold chain and blood storage facility
10. Telephone
11. Ambulance

However there are options for human resource; 4 specialists- surgeon, paediatrician, obstetrician, and physician and an adequate number of staff nurses. The guidelines recommend multi-tasking and redeployment of human resources. It makes special reference to training MBBS doctors in anaesthesia and C-section. The guidelines devote a special section on referral transport from villages to the facilities.

The guidelines do not make any mention of staff nurses and their role as midwives in the FRU making only one reference of “adequate number of staff nurses”. The guidelines are very broad with no mention of essential monitoring systems, management information systems and records and registers to be maintained at FRUs. When a CHC is operationalised to an FRU it will have additional manpower, infrastructure to function as an FRU.

Guidelines for Operationalizing a PHC for providing 24 hour delivery and new born care under RCH II

Under the RCH II programme, GOI provided guideline to assist the state in formulating their own implementation plans regarding the operationalization of 50% of PHCs and all CHCs for 24 hour delivery and newborn care services. A similar reference is available from the Tenth Planning Commission Mission document stating that “All sub district institutions with specialist should be re- categorized as CHC/FRU and all hospitals and dispensaries without specialist should be merged or re- categorised as PHCs”.(9)

Critical determinants of a facility being a 24 hour functioning PHC:

- 24 hour delivery services , both normal and assisted *
- Essential new born care*

- Referral for emergencies*
- Antenatal care and routine immunization services for children and pregnant women (besides fixed day service)
- Post natal care
- Early and safe abortion services (including MVA)
- Family planning services
- Prevention and management of RTI/STI
- Essential laboratory services

* Critical determinants of functionality

The guidelines stress that fund available under RCH I should be utilized for all civil works related to operationalization of LR, supply of 24 hour running water and electricity etc. There should be two Medical Officers (one residing at the facility) and at least 5 staff nurses (or ANMs trained as SBAs) to be available round the clock. Some indicators of Quality of services like proper signage of services provided (24 hours), name of next higher referral centre along with transportation facilities and charges to be put on board for the information of patients and relatives, have been mentioned. There has been a special mention (under the infrastructure need) to ensure privacy while examining female patients.

It further specifies that a 24X7 PHC should have adequate delivery kits and instruments for normal and assisted delivery, EmOC drugs (Inj Oxytocin, MgSo₄, Antibiotic) facility for oxygen. In addition to the above the PHC should have inpatient facility (4-6 functional bed); operational LR with earmarked newborn care corner, attached toilet facility, residential quarters for MO, Staff Nurse and ANM and other basic facilities like uninterrupted functioning of telephone connection, electricity backup, waste disposal etc.

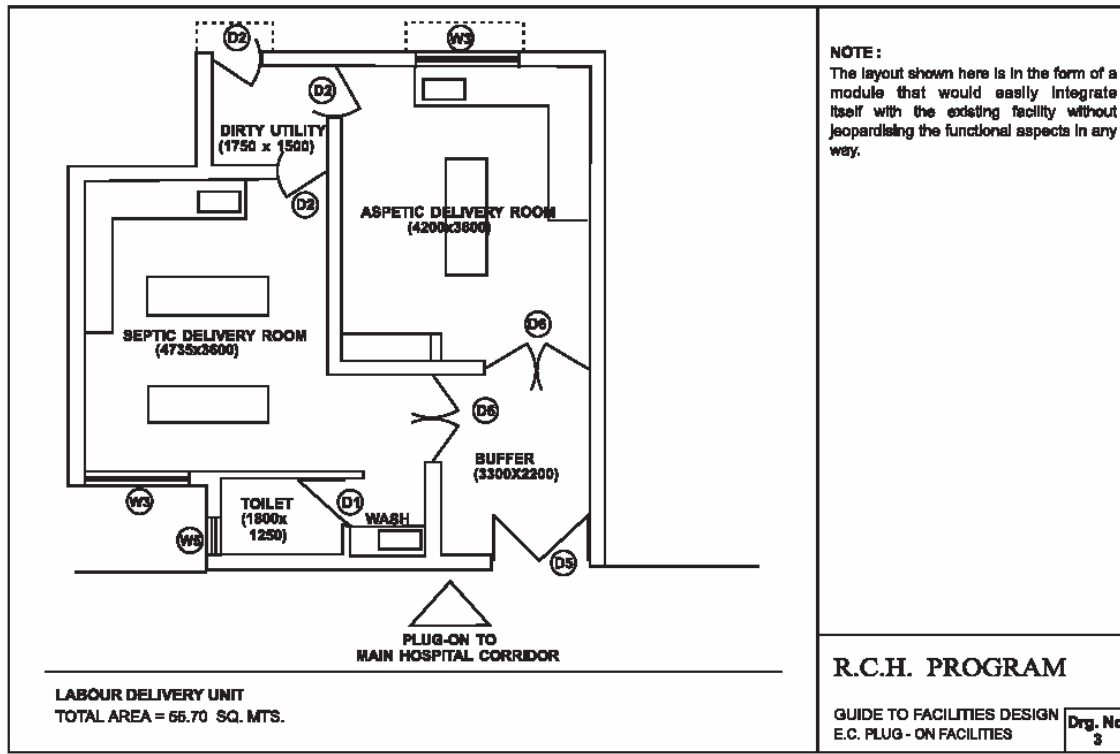
These guidelines are more like recommendation to the states and are not followed as mandatory practice.

IPHS for PHC and CHC

The guidelines for PHC (as compared to the CHC) provide much detail information with regards to delivery and obstetric care. The guidelines talk of setting minimum standards for the infrastructure of Primary Health Centres so that they deliver EmOC services effectively. They emphasize the basic requirement of infrastructure and manpower for maternal and newborn health. The document mentions that the LR should be well equipped with labour table, sets of delivery kits, separate areas for septic and aseptic deliveries, new born care corner etc. There is a specific mention of maintaining privacy in the document, however no details of privacy such as curtains on the doors and windows, windows to be placed above eye level, delivery tables should not face doors and windows etc, are given. According to the guideline the PHC should have a minimum of one MO and one staff nurse-midwife and one LHV. However it is recommended in the guidelines that to make the facility work as a 24x7 unit, one more Medical Officer (may be from AYUSH or a lady doctor) and two more staff nurses are to be added to the existing total staff strength of 15 making it to 17 (2 medical officers, 9 paramedical staff and 6 support staffs).

Though IPHS guidelines for CHC mention EmOC service as one of the functions along with normal and assisted delivery, it does not give details about the critical requirement necessary to deliver EmOC and function as a comprehensive, 24 hours delivery care unit. It generally refers that a CHC should have a Labour Room /OT. The man power (1 Obstetrician, 1 Anaesthetist, 7+2 Staff nurses or midwives) and necessary equipment requirement are mentioned briefly.

Annex 2



TYPICAL LAYOUT PLAN FOR LABOUR ROOM