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A Case Study**

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Abstract

Maternal Health Services are one of the basic health services to be provided by nay government health system as pregnant women are one of the most vulnerable victims of dysfunctional health system, India, in spite of rapid economic progress is still farm away from the goal of lowering maternal mortality to less than 100 per 100,000 live births. It still accounts for 25.7% maternal deaths. The maternal mortality in India varies across the states. Geographical vastness and socio-cultural diversity make implementation of health sector reforms a difficult task. The chapter analyses the trends in maternal mortality and various maternal health programs implemented over the years including the maternal health care delivery system at various levels including the recent innovative strategies. It also identifies the reasons for limited success in maternal health and suggests measures to improve the current maternal health situation. It recommends improvement in maternal death reporting, evidence based, focused, long term strategy along with effective monitoring of implementation for improving Maternal Health situation. It also stress the need for regulation of private sector and proper Public Private Partnership (PPP) policy together with a strong political will for improving Maternal Health.

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Introduction

Health and socio-economic developments of any country are interdependent. Yet the economic development in India has gained momentum over the last decade, but the public health system is lagging behind. Although government initiatives in public health have recorded noteworthy successes over time and the Indian health system is still ranked 118 among 191 WHO member countries on overall health performance (*WHO, 2000*). India has population of 1028 millions with decadal growth of 21 percent. The birth rate is 24 and total fertility rate is 3.2. India has high maternal mortality ratio at 301 and infant mortality rate of 58. Building health systems that are responsive to community needs particularly for the poor, requires politically difficult and administratively demanding choices. Maternal and child health services are basic health services to be provided by government health systems, as pregnant women and children are the most vulnerable victims of dysfunctional health systems. Most of the developed countries have low maternal and child mortality rates compared to developing nations. Certain developing nations like Sri Lanka and Malaysia have achieved low maternal mortality rates by adopting successful strategies such as development of community based midwives to provide skilled assistance at birth at community level within a functional health system. India, in spite of her rapid economic progress is yet to achieve goal of lowering maternal mortality less than 100 per 100,000 live births (1).

WHO estimates show that out of the 536,000 maternal deaths globally each year, 136,000 (25.7%) happen in India. In addition to these, millions suffer pregnancy related morbidity: estimates of Global Burden of Disease for 1990 show that India contributes 25% to disability adjusted life years lost due to maternal conditions. (2) Despite a series of national level safe motherhood policies and programmatic initiatives, there is a little evidence that maternity has become significantly safer over the last 20 years. Table-1 shows demographic and maternal child health indicators of India and states represented in this series. As seen in the national data, there is wide variation in demographic and health indicators in different states of India. On one end there are states such as Uttar Pradesh and Rajasthan which have high fertility rates and maternal mortality, and on other end are Kerala and Tamil Nadu that have low fertility rates and maternal mortality comparable to developed nations. Geographical vastness and socio-cultural diversity of India are two reasons for difficulty in implementing health system reforms. Status of women is generally low in India except for southern states and eastern states such as Mizoram. Female literacy is 54 percent only and women lack ability and empowerment to

take decisions especially regarding availing reproductive health services.

Table 1
Demographic and Health Indicators of India and states (Ref 3)

Indicators	India	Tamil Nadu	Gujarat	Rajasthan	Andhra Pradesh
Population in million (Census 2001)	1028	62	51	57	76
Decadal Growth rate (1991-2001)	21	12	23	28	15
Population density per sq. km (2001)	324	478	258	165	275
Birth Rate (2005)	24	16	24	29	19
Death Rate (2005)	7.5	7.4	6.9	7.0	7.3
Total Fertility Rate	3.2	1.7	2.9	3.7	2.0
Mean age of effective marriage (2005) in years	20	22	20	20	19
Literacy Rate :Total (2001)	65.3	73.4	69.1	60.4	60.4
Male	75.3	82.4	79.9	75.7	70.3
Female	54.1	64.4	57.8	43.8	53.7
Sex ratio (No of Females per 1000 Males)	933	987	920	921	978
Life expectancy at birth-Females(2005)	66	69	69	67	68
Infant Mortality Rate	58	37	54	68	57
Child Mortality Rate(2005)	17	9	16	20	15
Maternal Mortality Ratio as per SRS (2003)	301	134	172	445	195

Methodology

Objective of the case study is to describe the present situation in India regarding maternal health, to estimate the impact of safe motherhood programs implemented and suggest how to improve the situation. It is based on a review of literature, secondary data collected from national level management information system, interviews with stakeholders and a study of key institutional processes, roles and authorities of key actors, organizational structure and function and administrative support. Published and unpublished reports of government and non- government agencies were reviewed to gain insight into the maternal health situation in India. Some of the data presented in the document is from National Family Health Surveys (NFHS) and District Level Household Survey (DLHS). Information regarding health infrastructure and human resources was collected from DLHS, facility survey and national government documents/website.

Safe Motherhood programme strategies and implementation were analysed to understand their effect on performance indicators of maternal health, including past efforts and new initiatives. Reliable data on maternal mortality and morbidity in India however, are not available, and present estimates vary considerably. There are also gaps in information on process and input indicators, such as how many first referral units are functional and availability of specialists for emergency obstetric care.

Results

Maternal Health Indicators

The government's Health Survey and Development Committee report of 1946 (also known as Bhore Committee report) is one of the earliest references to maternal mortality in India. After reviewing the available evidence, the committee concluded that the country's maternal mortality ratio (MMR) was around 2000 deaths per 100,000 live births (4). Mudaliar Committee in the late 1950s estimated that maternal mortality had decreased to 1000 deaths per 100,000 live births (5). A principle cause for the decline was thought to be the decrease in the incidence of malaria, because pregnant women were especially suffered higher fatalities than those who were not pregnant (6). In the early 1970s, SenGupta and Kapoor undertook a further study of maternal mortality and determined that it had. Data from the Registrar General's surveys on cause of death in rural areas estimated that maternal mortality had declined to 400-500 deaths per 100,000 live births. The findings of a community-based study on maternal mortality in Ananthapur district of Andhra Pradesh have substantiated this view. This study estimated an MMR of 798 deaths per 100,000 live births during 1984-85 for the district (7).

In contrast, there are other studies that suggest that maternal mortality levels were not so high. Data collected from 109 hospitals from all over the country in 1992 undertaken by the Maternal and Child Health (MCH) division of the Union Ministry of Health and Family Welfare showed an MMR of 495 deaths per 100,000 live births for the country (8). Estimates of maternal mortality from National Sample Surveys (NSS) and the SRS show that maternal mortality has declined from a level of around 1300 deaths per 100,000 live births in 1957 to 301/100,000 in 2003 (5,14).

Table-2
Estimates of Maternal mortality ratio from different sources over last 50 years (9)

<i>Data Source</i>	<i>Reference Year</i>	<i>Maternal Mortality Ratio (MMR)</i>
NSS, 14 th round	1957	1287
NSS 16 th round	1960	1355
NSS, 19 th round	1963-64	1174
SRS	1972-76	892
SRS	1977-81	844
SRS	1982-86	568
PN Mari Bhat's estimate	1982-86	580
World Health Report, 1999	1990	570
NFHS-I	1992-93	437
1997-98 retrospective MMR surveys*	1997-98	398
SRS	1997	407
SRS	1998	408
NFHS-II	1998-99	540
SRS prospective household reports*	1999-2001	327
World Health Report, 2005	2000	540
SRS special survey of deaths using RHME	2001-03	301

Table 3
Regional variation of estimated MMR per 100,000 live births

Source and Year	Bhat*	Bhat*	IIHFW@	SRS	SRS	SRS
States	1982-86	1994	1998-99	1998	2001	2003
Punjab	346	289	351	244	144	138
Haryana			468	161	190	169
Uttar Pradesh	879	612	737	867	772	700
Bihar			714	651	549	486
Rajasthan	614	588	526	647	655	561
Madhya Pradesh			601	554	534	474
Orissa			552	297	367	295
Assam	709	636	762	587	403	474
West Bengal			451	251	175	148
Maharashtra	414	471	365	172	138	117
Gujarat			393	52	199	166
Andhra Pradesh	379	383	341	151	176	148
Karnataka			364	225	229	189
Tamil Nadu			284	89	115	88
Kerala			262	92	93	66
India	580	544	466	348	312	274

(Ref: 11, 12, 13)

* Regional estimates covering more than one state-based on rural households.

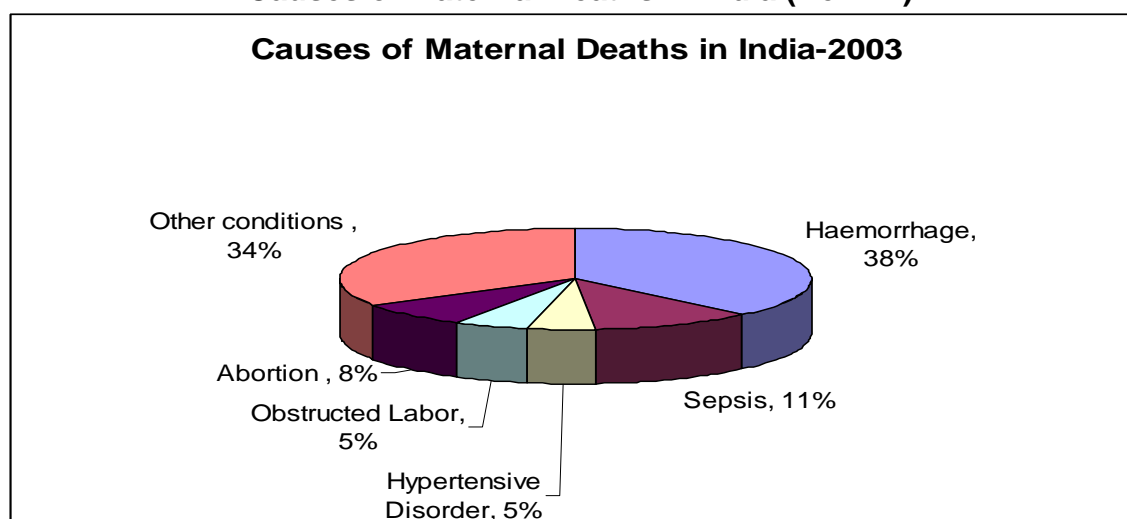
@ Estimates of MMR from a regression model based on NFHS II data

SRS=Sample Registration System; IIHFW = Indian Institute of Health and Family Welfare, Hyderabad.

It is difficult to get reliable estimates of MMR given maternal death is a rare event and vital registration system is not well organized and accurate. Not many special studies have estimated maternal mortality and international experts expect the rate to be 1.5 times higher at 450 (10). As seen in Table-3 different sources give a range of estimates for MMR for states. The Sample Registration System, a continuous demographic survey for vital data that has the largest sample size, also gives inaccurate estimates of MMR.

Other regional estimates of maternal mortality have small sample sizes but indicate that maternal mortality is much higher than that projected from the vital registration system. The same is true for NFHS data that also shows higher MMR. Although the estimates of maternal mortality are debatable, there is enough information to indicate that haemorrhage is the major killer of mothers in India. As per SRS data (figure-1) about 38 percent of women are estimated to die from haemorrhage, mostly post partum haemorrhage. Within “other conditions”, anaemia is found to be the main medical condition leading to maternal death. Anaemia is common in reproductive age due to various socioeconomic and demographic reasons such as low status of women, lack of access to good nutrition, high fertility and short gap between births. As seen in Table-4 more than 50 percent of pregnant women are anaemic.

Figure 1
Causes of Maternal Deaths in India (Ref: 14)



Deaths due to sepsis and obstructed labor may be attributed to the high proportion of home deliveries and lack of skilled birth attendance. In spite of the Indian government's liberal policy on abortion, lack of access to safe abortion leads to 8 percent of maternal mortality due to abortion related complications.

The National Family Health Surveys have been collecting data on various maternal health indicators since 1992. As seen in Table-4, from NFHS 1 in 1992 to NFHS 3 in 2006 there has been an improvement in maternal health indicators in general. Institutional deliveries have risen from 26 to 40 percent, yet more than 50 percent deliveries are taking place at home. Skilled birth attendants attend less than 50 percent births. Post natal care is the most neglected area of maternal health as only 42 percent of women received post natal care within 2 months of delivery. As seen in the table overall progress has been slow in spite of safe motherhood programs such as Child Survival and Safe Motherhood (CSSM), Reproductive Child Health 1 (RCH-1) and others discussed later.

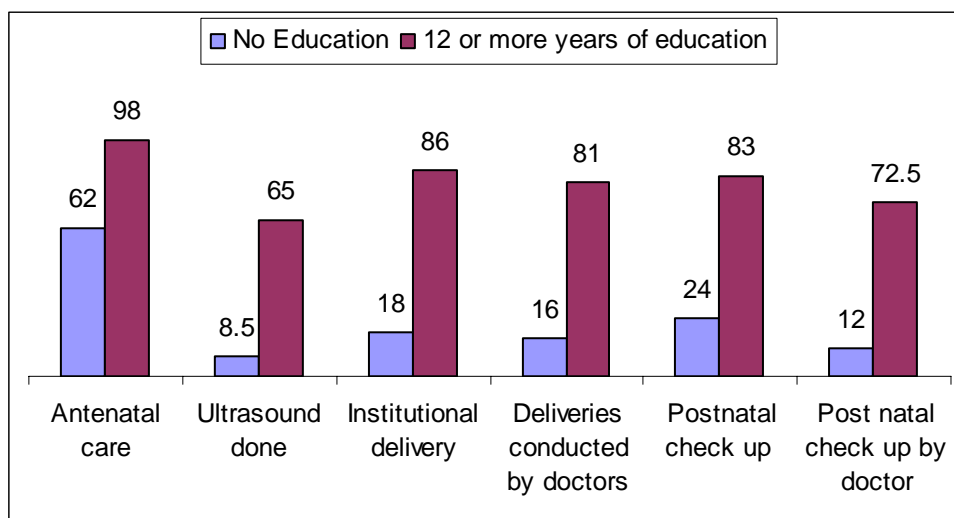
Table 4
Maternal Health Indicators in India (Ref.15)

Indicator (%)	NFHS 1 (1992-93)	NFHS 2 (1998-99)	NFHS 3 (2005-06)
Pregnant women with anaemia	NA	50	58
Three antenatal check ups	44	44	51
Institutional deliveries	26	34	39
Deliveries conducted by health personnel	33	42	48
Mothers received post natal care within 2 months of delivery	NA	16	42

Inequities in Maternal Health

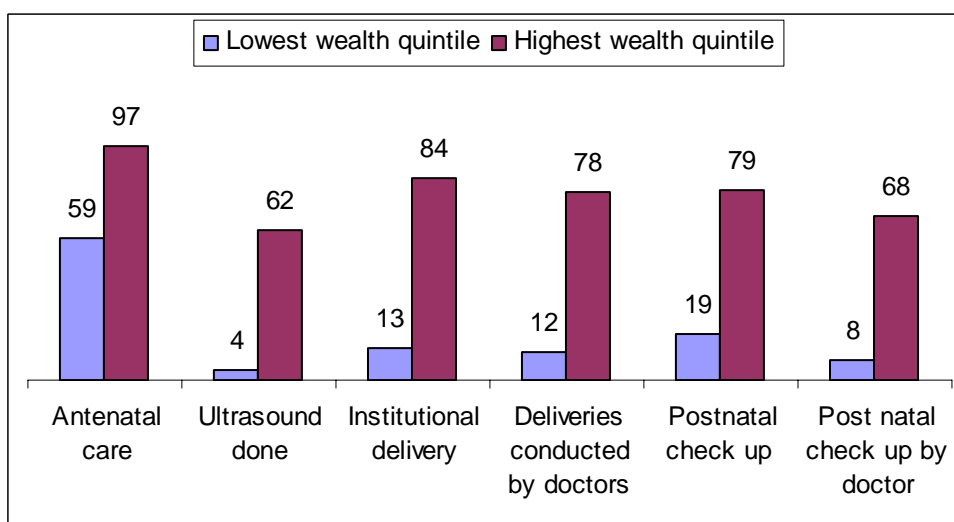
Maternal education and economic status also impacts access to care as seen in figure 2 and 3 illiterate mothers and women from lowest wealth quintile have reduced access to basic maternal health care. Only 18 percent of illiterate mothers had institutional delivery as compared to 86 percent in mothers with 12 or more years of education same difference is seen for post natal care.

Figure 2
Graph comparing access to maternal health care according to maternal education
(NFHS-3, 2005-06) Ref: 16



Women from low economic status have 13 percent institutional delivery compared to 84 percent for highest wealth quintile. Same situation is for post natal care where only 19 percent of mothers of lowest wealth quintile avail post natal care compared to 79 percent for highest wealth quintile.

Figure 3
Graph comparing access to maternal health care according to maternal wealth status
(NFHS-3) Ref-16



The incidence of anemia has increased, although coverage of antenatal check up has increased during which iron folic acid (IFA) tablets for anemia should be provided. Table-5 shows that the women receiving any IFA tablets have also increased, but obviously problems in service delivery and performance must be continuing. In spite of the

emphasis on antenatal care by the government, about half of the pregnant mothers still do not complete three antenatal visits and a quarter do not receive tetanus prophylaxis.

Table 5
Comparison of performance indicators for maternal health services in India over time (Source-Ref.17, 18)

Indicators	India		
	NFHS-I 1993	NFHS-II 1999	NFHS III 2006
Coverage of Ante Natal Services			
Tetanus Toxoid Injection (2 or more)	54	67	76
Completed 3 ANC visits	44	44	51
Received IFA tablets	50	58	65
Place of Delivery			
Institutional Deliveries	26	34	40
Domiciliary Deliveries	74	66	60
Institutional Deliveries			
Public	15	16	18
NGO/Trust	NA	0.7	0.4
Private	11	17	20
Type of Deliveries			
Vaginal Deliveries	97	93	91
Caesarean section	3	7	9
Assistance during delivery*			
Doctor	22	30	35
ANM/Nurse/Mid Wife/ LHV	13	11	11
Other Health professionals	NA	1	1
Dai (TBA)	35	35	37
Other	30	23	16

Institutional deliveries have risen but the percent of deliveries taking place in the public institutions has not shown remarkable improvement. The majority of increase is in the private sector, which is alarming as it increases the financial burden on poor women. The Caesarean section rate has increased and is now at about 9 % nationwide but the majority of increase is seen in urban India; access to comprehensive obstetric care is still a problem for rural women. The table also shows that the proportion of deliveries by traditional birth attendants has remained steady over the past decade and a half, with a slight decline in the percentage conducted by ANM/LHV.

Maternal Health Care Delivery System

Facility level maternal health care

Post independence India developed a three-tiered health care delivery system to reach out to remote areas. The aim was to provide primary care at village level, secondary care at sub district and district levels, and tertiary care at regional level. Medical colleges were

to be developed as apex institutes with specialities. Over the period of fifty years, India has expanded the public health infrastructure to include 144,988 sub centres, 22,669 Primary Health Centres (PHC) and 3,910 Community Health Centres (CHC) (19) Table-6 shows details of public health facilities. Unfortunately, there is no system of regular monitoring of functionality of health facilities at national level.

Table 6
Details of Public health facilities, 2006 (Ref 20, 21)

Health Care Institution	Population Norms	Level	Nos in India (2006)	Highest Medical Services Provider
Medical College Hospitals	5-8 million	Apex	242	Super Specialists
District Hospital	2 – 3 Million	III	370	Specialists including Obstetrician
First Referral Unit (FRU)	3,00,000 – 5,00,000	II	1926	Obstetrician
Community Health Centre (CHC)	1,00,000 – 3,00,000	II	3,910	Medical Officer/Specialists
PHC	30,000	I	22,669	Medical Officer, Staff Nurse
Sub-centre	5,000	I	144,988	ANM

The Indian public health system is fraught with basic problems such as inadequate infrastructure and a dearth of skilled staff. As seen in Table-7, less than half the sub centres and PHCs are functioning in rented buildings or do not have buildings. About a quarter of FRUs do not have facilities of telephone and forty percent do not have transport facilities. Above seventy percent of FRUs and CHCs do not have linkages with a district blood bank. More than half of CHCs, FRUs and district hospitals do not have quarters for resident medical officer (RMO). None of the national facility surveys mention maternity ward, so it is not clear how many exist.

Table 7
Infrastructure and human resources available (%) in India for
Maternal Health Care, 2006 (Ref. 22, 23, 24)

Infrastructure	Sub Centre	PHC	CHC	FRU	DH
Own Building	45.2	69	84	94.7	97
Electricity	43.1	66.4	91.8	94.3	96.7
Operation Theatre	NA	NA	87.6	93.7	99.5
Labour Room*	NA	48.4	31.0	33.3	44.4
Telephone	NA	NA	62.2	74.8	96.7
Vehicle on Road	NA	NA	57.4	56.8	89.9
Linkage with district Blood Bank	NA	NA	15.8	27.2	67.5
Quarters for RMO	NA	NA	44.0	42.2	47.1
Obstetrician	NA	NA	51	71	90.0
Anaesthesiologist	NA	NA	37	69	83.0
Paediatrician	NA	NA	54	73	90.0
Staff Nurse	NA	NA	83	88	90.0

* For CHC, FRU and DH, information is available for separate aseptic labor room availability

As seen in the table a dearth of specialists is a major issue for providing delivery care and EmOC in public health system. More than fifty percent of CHCs and thirty percent of FRUs do not have anaesthetists. On the other hand as seen in the table- 5, more than half of the institutional deliveries are taking place in the private sector. In India private sector which is unregulated, is an important provider of maternal health services. There are issues of quality, qualified staff and observation of protocols in the private sector. There are problems in obtaining data about and from private sector about services provided. Regularization of private sector and implementation of protocols across the board will help improve access and quality of care provided by both private and public sectors.

Community level Maternal Health Care

Auxiliary Nurse Midwives were envisaged to be community based midwives in 1960s. The auxiliary nursing and midwifery course for two years focused mainly on maternal and child health at the community level. The graduates were expected to provide a wide range of public health services but their priority was maternal and child health. This continued for two decades till major policy shifts between 1975-77 changed the access to maternal health services among rural poor - the introduction of the multipurpose health worker scheme; the integration of MCH into family planning or family welfare. These two policy changes resulted in drastic decline in the quality of midwifery training and practice in the country. The need for speeding up the family planning programme meant that many more health centres and ANMs were required. Under pressure from the government, the Indian Nursing Council (INC) revised the ANM course and reduced the duration from 24 months to 18 months.

The responsibilities of the ANMs underwent a drastic change along with their designation of Multi Purpose Health Workers (MPW) along the recommendation of Kartar Singh Committee (24). In fact, they were made the custodians of the sub centres and with responsibility and accountability for achievements along with running and maintaining the centres. Strong action was taken if they did not achieve the monthly target of family planning and immunization cases but no action was taken if they did not conduct deliveries or visit postnatal mothers. Community perception of ANMs changed from maternal and child health care providers to family planning/immunization workers. Along with this dilution and weakening of the ANM skills, technical supervision underwent a decline. Public health nurses (PHN) as a cadre with higher qualifications were diluted and in 1990, health visitors were promoted as PHNs without further training. The two and a half years Lady Health Visitors course was discontinued in the 70s and a six month promotional course was started according to the INC guidelines. In the 1990s the six months promotional course was converted into six weeks orientation course making public health nursing and midwifery supervision negligible and ineffective in the rural areas.

In conclusion, policy shift towards family planning changed role of ANM from community based midwife providing maternal health care to multi purpose worker providing preventive care services such as family planning and immunization (25).

Management of Maternal Health Services

At the national level there are two major divisions within the Ministry of Health and Family Welfare. These are the department of Family Welfare (DFW) and Department of Health (DH). The division of work between DFW and DH is such that maternal child health and reproductive health, rural health, primary health care, family planning come under DFW, while medical colleges, national institutes, disease control programs come under DH.

The technical unit for maternal health in the Government of India (the MH division) is composed of only four officers - one Deputy Director General (DDG) MH, and three assistant commissioners. One post of assistant commissioner has been vacant for more than 10 years resulting in only three technical officers in the MH division. This structure of MH division has not increased over time: the annual report of the ministry for the year 1998-1999 shows the same structure. The MH division is to look after all technical and administrative aspects of all the maternal health activities throughout India. Theoretically functions of a national MH unit should include –

- ❖ Provide technical advice to minister and secretary of Health & Family welfare

- ❖ Design new programs
- ❖ Set technical standards & develop guidelines
- ❖ Review research and develop new evidence-based strategies
- ❖ Review training content
- ❖ Monitoring implementation and evaluate outcomes
- ❖ Monitor program performance including quality
- ❖ Provide information for addressing parliament questions
- ❖ Provide technical information in policy, legal and other issues
- ❖ Commission special studies, review data
- ❖ Deal with professional organization, NGOs and consumer groups etc.
- ❖ Interact with donors, international agencies and development partners
- ❖ Accompany various planning and evaluation missions of donors.

Given these functions, it is clear that the MH division needs a high level of technical capacity. The present structure of MH division with only three officers is highly insufficient, even in terms of numbers. As the decision making powers are not with these technical officers, the leadership role is missing in maternal health division for safe motherhood programs.

Besides the limited numbers of national technical officers in the MH unit, it is not compulsory for them to have public health training or specific qualification in maternal health. Any officer from the Central Government Health Services can be assigned to the MH unit. Thus technical / public health knowledge and skills are not ensured and it depends on the incumbent's background and previous experience. Some may have public health experience and qualification and others may not. As all technical officers come from Central Government Health Services, which are mainly in Delhi and other union territories – all urban areas-- the officers do not have adequate field experience of implementing programs at state level. There is no fixed tenure of the officers in MH division. They can be transferred even in a short time, which affects their performance, as there is a learning period in every position. The officers of the MH unit reported that they have to spend about 40-50% of time on non-technical issues. More time is used up in administrative work because the lower level administrative support is also weak (26).

Safe Motherhood Programs in India

After independence in 1947 rural health services were established over time with primary health units (PHU) staffed by a doctor, a nurse midwife, a health visitor, a sanitary inspector and a female attendant (Aya). Trained nurse midwives were posted in hospitals or PHU. Their role in PHUs was to conduct deliveries and visit a population of 10,000. Sub centres were established below PHUs to provide basic medical care and delivery care at the field level. To place trained personnel in this newly instituted health centres, temporary workers with preliminary education were trained for shorter time and recruited

at sub centres. These workers were called “Auxiliary Nurse Midwife” Auxiliary workers are technical workers in a particular field with less than full qualifications (WHO 1961). Shetty committee suggested training auxiliary nurses and midwives for short time to work under supervision for specific duties. Twelve training centres were established by 1954 to fulfil the requirements. (27) Later on committees such as Bhore and Mudaliar suggested continuation of auxiliary cadre to provide basic health care at field level. Hence, ANMs gradually became permanent staff in public health system.

National programs have shifted the focus from comprehensive reproductive health services to preventive services. In the mid 60s family planning was integrated with MCH activities and projected as a program deserving the highest priority (GOI, Planning Commission 1968). A separate department and structures of family planning were created at the central, state and district levels with the sole function of promoting family planning through the PHC staff. This created an impression that the staffs funded by FP program was to restrict themselves to only FP activities whereas in theory all the Sub centres and PHC doctors had similar job descriptions which included MCH too. The new ANMs employed under the FP program did not feel the need to stay at SC Village since their work did not relate to any emergencies such as childbirth.

During mid 80s the immunization program called the Expanded Program for Immunization (EPI) for children below five years started to receive priority. The implementation of the program at field level was assigned to the ANM. EPI was followed by Universal Immunization Program (UIP), again supported by UNICEF. The National Child Survival and Safe Motherhood Program (CSSM) developed by Government of India and supported by World Bank and UNICEF was to provide child survival and safe motherhood services through the PHC system in India. It started in 1992 as follow up to the Universal Immunization Program. There were eight goals of the program out of which one was for maternal health viz. Reduction of maternal mortality from 4 to 2 per 1000 births. Although the package specified care at birth as a service, the work plan of the ANM at the sub centre level did not specify conducting deliveries in the list of critical activities. Similarly this was missing from the module for planning MCH services at the PHC and SC level and the sample work plan of the ANM given in the workers’ manual (28). Unknowingly the program created a conceptual conflict through its fixed day schedule by giving more priority to routine preventive services compared to emergency services.

Following the International Conference on Population and Development, 1994, the government started the process of reorienting the family planning and maternal child

health programmes into a new program called the Reproductive Child Health I (RCH I). The World Bank's sector review and project appraisal document show that a lot of background work and thinking had gone into the development of the program. To provide skilled care at birth, the RCH program incorporated additional nursing staff for primary health centres for round the clock maternal health services and incentives for institutional deliveries. Both these programs had too many components on maternal and child health for which the government health system was not equipped. Key features of the maternal health component CSSM and RCH programs are presented in Table-8.

Table 8
Key elements of maternal health component of CSSM and RCH-1
and issues in implementation (29, 30)

	CSSM	RCH-1
Duration	1992-1996	1997-2004
Strategies	<ul style="list-style-type: none"> • Upgrade existing CHCs to FRUs for providing emergency Obstetric care • Convert village level immunization to Mother and Child protection sessions • Train TBAs and skill up gradation of existing staff • Provide ANMs with sub-centre medicine kit • Educate people about the program • Provide equipment/ supplies for safe motherhood and neonatal care at CHC level. 	<ul style="list-style-type: none"> • Make FRUs functional by providing contractual staff, building renovation. • Increase availability of specialists. • Ensure availability of blood at FRUs • Provide funds given to local governing bodies to provide emergency transport facilities • Improve quality of services • Provide additional Honorarium to the PHC and CHC staff for attending deliveries after office hours • Add additional staff nurse for selected PHCs for 24/7 delivery services. • Provide mode of transportation for ANMs. • Provide fixed drug and equipment kit at each level as given in CSSM
Service package	<ul style="list-style-type: none"> • Immunization of pregnant women • Prevention and treatment of anaemia • Antenatal care & early identification of maternal complications • Delivery by trained personnel (including trained traditional birth attendants) • Promoting institutional delivery • Management of obstetric emergencies • Birth Spacing 	<ul style="list-style-type: none"> • Essential Obstetric care • Emergency Obstetric Care • 24 hours deliveries at PHC & CHC • Referral transport • Blood storage at First Referral Units (FRU) • Access to Medical termination of pregnancy

Issues in Implementation		
Training	<ul style="list-style-type: none"> • Short term (6 day) training of MOs with little focus on maternal health • Long term training for EmOC skill building of general doctors was not implemented. • Supplies and infrastructure improvement did not link with training 	<ul style="list-style-type: none"> • Training load could not be completed. • Few medical officers trained in short course for anaesthesia & resuscitation for EmOC which was not enough for skill building. • Training modules developed along with National Institute of Health and Family Welfare but practical training too short (2 week) for skill development.
Supplies	<ul style="list-style-type: none"> • Delayed supply of high quality useful equipment • Low utilization • Maintenance system not developed 	<ul style="list-style-type: none"> • No flexibility for local purchase of required supplies. • Lack of supplies and equipments • No maintenance contracts
Staffing	<ul style="list-style-type: none"> • Dearth of key staff/specialists at FRUs-making them dysfunctional • No additional staff recruited • General doctors and ANM/Nurses lacked skills in EmOC 	<ul style="list-style-type: none"> • Private anaesthetist & obstetricians not available in remote areas on contract • The role of ANMs, staff nurse hired on contract was not clear and insecurity of job.
IEC & Community Participation	<ul style="list-style-type: none"> • Limited scope & coverage of program • Limited to essential obstetric care 	<ul style="list-style-type: none"> • Communication and awareness about the program preceded improvement in service delivery which led to dissatisfaction with the system.
Service Delivery	<ul style="list-style-type: none"> • Safe Motherhood component was partially implemented or remained weak • Access to blood at FRUs was difficult because of high standards • Proposed maternal mortality review committees not established 	<ul style="list-style-type: none"> • Inadequate linkages between components like FP., Maternal Health, Child Health, and RTI/STD. • Haphazard implementation e.g. some FRUs got additional staff while others got renovated, some villages received the transport money, and others did not. • Transport money remained unutilized. • Contractual staff did not provide round the clock services. • No efforts towards improving quality of services. • Process for licensing blood storage unit at FRUs too long.

Supervision, Monitoring and evaluation	<ul style="list-style-type: none"> • Data not available for all components of the service package. • SM focused only on TT coverage and IFA distribution. • Functionality of FRUs not monitored, no service statistics for FRUs collected • Modified the existing Management Information System (MIS), but more focused on Immunization and Family planning 	<ul style="list-style-type: none"> • Independent district level household surveys commissioned to assess RCH services. • Few components were closely monitored; anecdotal evidence indicates large scale inflation of service statistics by field functionaries. • Functionality of FRUs continued to be un-monitored. • Systematic comprehensive evaluation not done.
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In 2005, with World Bank and other donors assistance RCH-2 was started. RCH 2 (2005-2012) again has many components and it revives unsuccessful strategies such as village level volunteers (ASHA). RCH-2 has also given more flexibility to states to develop strategies appropriate for them. RCH-2 is implemented under National Rural Health Mission (NRHM) which has led to decentralization and increased powers to field level workers. NRHM is an initiative to bring all health programs under one umbrella to improve implementation and monitoring. NRHM provides a thrust for reduction of child and maternal mortality and reduction of fertility rates. Efforts are being made to provide quality Reproductive Health services (including delivery, safe abortions, treatment of reproductive tract infections and family planning services to meet unmet needs, while ensuring full reproductive choices to women).

The main strategy for maternal mortality reduction of the government focuses on safe/institutional deliveries in the governmental and non-governmental sectors under NRHM. Efforts to develop competencies needed for Skilled Birth Attendants (SBAs) in the entire cadre of staff nurses and ANMs will be undertaken. Regular training of select medical officers to administer anaesthesia has been taken up. Also multi skill training of medical officers, ANMs and para-medics is to be initiated to close specialist skill gaps. Intensified IEC is to be pursued to ensure behavioural changes that relate to better maternal survival and women's health i.e. spacing, age at marriage, education of the girl child. CHCs are being upgraded to FRUs for providing referral services to the mother and child and taking care of obstetric emergencies and complications for provision of safe abortion services and for prevention, testing/counselling in respect of HIV AIDS. Reduction in MMR will also be closely monitored through social audit, which is being introduced at the village level. (31)

Blood Banking Services: Vital but Neglected

Blood transfusion services occupy a vital space in any national health services delivery system. Supreme Court Judgement in 1996 resulted in improvement in blood safety in India but it also made blood scarce in rural areas. Blood transfusion services are plagued with fragmented management as blood banks and blood transfusion centres are operating in isolation without stringent quality control. Most of the government banks are operating in hospitals and operate with minimal infrastructure with inadequate/irregular supply of blood. There is no monitoring or data on indication of blood transfusion and complications of blood transfusion. It is difficult to know use of blood in obstetric emergency and availability. Most of the comprehensive emergency obstetric care centres do not have connections with blood bank (32). Recent initiative of establishing blood transfusion councils by National AIDS Control Organization will help develop blood transfusion services and reorganize them to make safe blood available to those needy. There is a plan to have blood storage centres at most of the centres where obstetric emergencies are handled under RCH-2.

Innovations for Maternal Health Services

There have been major innovative schemes implemented in different states in past few years which have shown excellent results. Some of these efforts are described below:

Improving access, utilization and quality of EmOC:

1. The AMDD programme supported UNICEF and UNFPA in India to improve the EmOC services in the states of Rajasthan and Maharashtra, where they had ongoing programs. Key activities for upgrading the EmOC services included: repair and renovation of selected facilities, upgrading equipment and supplies, training staff in basic skills for EmOC, improving management, management information systems, and quality of services. This project showed that it is possible to improve EmOC services in India on a large scale in the government primary health system with moderate resources if focussed activities are carried out with technical inputs (33).
2. Tamil Nadu government introduced CEmONC (Comprehensive Emergency Obstetric Neonatal Care) centres at selected CHCs and made selected FRUs functional by hiring specialists on contract basis or shifting equipments and specialists. Additional staff nurses are posted at the PHC to ensure round the clock delivery care. Community mobilization and ensuring quality services has improved utilization of public health institutions. There is a separate public health

cadre for managing health care services to assure all the innovations are implemented and monitored well. Tamil Nadu government has initiated maternal death review since last 10 years and is able to capture most of the maternal deaths. These reviews have sensitized both administrators and health system and have led to many policy changes to improve maternal health care services (34).

3. The government of Gujarat has launched a social insurance scheme for delivery care for women below poverty line. The scheme has fixed fees paid to private providers per 100 deliveries for normal delivery and all interventions for obstetric complications including caesarean section. In addition the women get money for transport and the accompanying person also gets a nominal amount. This innovative scheme has expanded the available choice of providers in rural areas and has reduced the cost barrier. A public private partnership with corporate supported initiatives such as Emergency Management Research Institute (EMRI) has improved referral system. Training of general doctors for caesarean section and anaesthesia has improved access to comprehensive obstetric care (35).
4. At national level, schemes like Janani Suraksha Yojana (Financial incentives for nutrition and transport for institutional deliveries) and ASHA were launched recently. Anecdotal evidences from states suggest that there has been major increase in institutional deliveries because of financial incentives given. ASHA has been launched in some states and has improved community mobilization efforts significantly. Indian Public Health Standards (IPHS) and development of protocols for emergency obstetric care are initiatives to improve quality services provided.

Improving Human resource and logistic management:

1. The Government of India and Federation of Obstetricians and Gynaecology Societies of India (FOGSI) have started training general doctors for comprehensive emergency obstetric care in selected states since 2005. Soon this training will be expanded to national level. This will help in overcoming constraint of skilled people to manage delivery complications. There have been initiatives for anaesthesia training for general doctors by states such as Gujarat.
2. Tamil Nadu Medical Services Corporation and Rogi Kalyan Samitis are efforts to improve logistics management in public health system. These efforts have ensured smooth supplies of essential drugs and equipments and maintenance of equipment. It has also helped in decentralization of financial powers which has

improved day to day management of primary health care facilities.

In addition to these efforts there are many NGOs working on safe motherhood in India in collaboration with government and have carried out successful pilot innovations to improve maternal health indicators.

Discussion

As seen in Table 8, although strategies were in place, the fragmented approaches of both CSSM and RCH-1 meant the programmes did not live up to expectations. It has been shown in developing countries such as Sri Lanka and Malaysia that focused efforts with implementation of evidence based strategies leads to reduction in maternal mortality. (36) Unfortunately the maternal health indicators of India have not improved significantly in the past decade. Following are some of the reasons for limited success:

Programmatic and non-programmatic reasons for limited success:

1. Policy, programme priorities and Governance Issues:

Maternal health programs have suffered because of cross cutting policy and governance problems. For example, government providers are not staying at the place of posting therefore are not available round the clock for providing delivery care and emergency services. Rational posting and transfer policies are non-existent or not followed. Delegation of clinical functions is unclear at field level leading to unnecessary referrals. Until very recently nurses and ANMs were not allowed to provide basic EmOC and medical officers were not allowed to provide comprehensive EmOC, in the absence to specialists. In addition to that, new blood banking regulations has limited access to blood in rural areas. Lack of clear policies necessitates women to travel to district headquarter hospital for EmOC leading to higher mortality and morbidity.

2. Absence of independent advocates for maternal health in the civil society

Professional medical organizations of India have tried to promote maternal health but could not make much impact as collaboration between professional bodies and the government on maternal health issues has been weak. Women's groups who are active in blocking newer contraceptives have neglected the tragedy of maternal mortality. Political parties and leaders have not played any active role in promoting maternal health. Most international agencies focused on family planning (World Bank, USAID, and UNFPA) and child survival (UNICEF) with neglect of maternal health. As maternal death and disability does not cause any obvious epidemic, even mass media hardly pays any

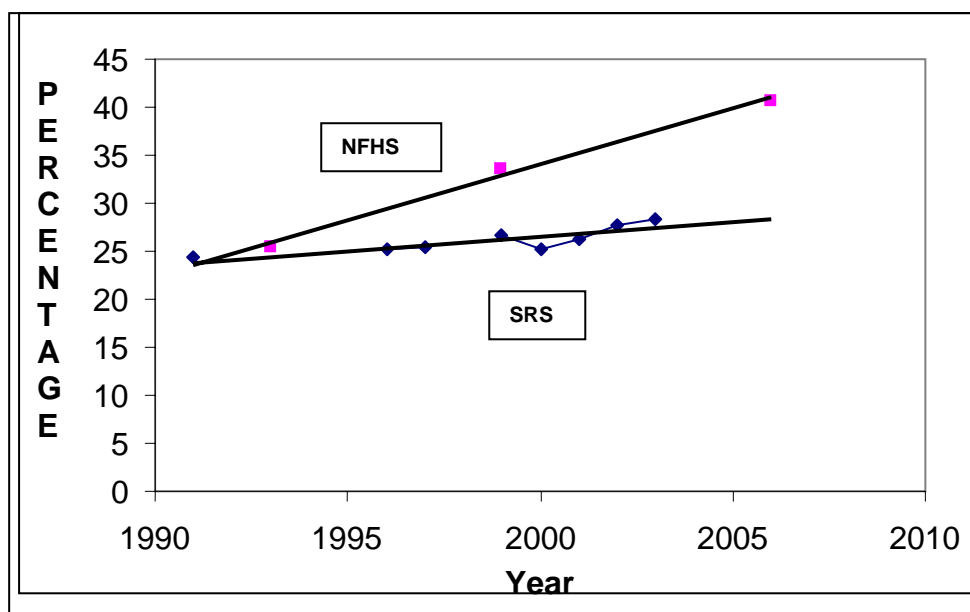
attention to this tragedy. The consumer groups, the judiciary and the members of legislative assemblies and parliaments members also ignored this massive tragedy of maternal mortality. National Human Rights Commission and National Women's Commission have paid little attention to high numbers of maternal deaths in India. Thus maternal death has not been a subject of socio-political or legal debate in India.

3. Lack of reliable estimates of maternal mortality

Establishing a reliable vital registration system is a must to achieve low maternal mortality rates. Countries such as Sweden, Sri Lanka and Malaysia established robust vital registration system at early stages of their battle against maternal mortality. India has a weak vital registration system in which the majority of maternal deaths are not recorded. Hence most estimates of maternal mortality are underestimates. It is difficult to know the impact of safe motherhood programs without reliable estimates of maternal mortality and morbidity. The Sample Registration System also does not give good estimates of maternal mortality.

Although accurate data on maternal mortality is not available, the number of maternal deaths in the world estimated by WHO, UNICEF and UNFPA for the year 2000 were 529,000. WHO estimates that of the 199,000 maternal deaths in South Asia, nearly 74% will be in India- the country with the highest number of estimated maternal deaths (ref WHO 2001 estimates). This translates to approximately 144,000 annual maternal deaths; or one death every 4 minutes, or a MMR of 540 per 100,000 live births. It is necessary to preface that an understanding of maternal mortality in India – levels, causes and patterns – is at best incomplete and unsatisfactory. In contrast to infant mortality for which estimates are available from the Registrar General of India, there is no sufficiently robust system for estimating maternal mortality on a routine basis. Perhaps the neglect of the subject itself is indicative of the position accorded to women in India. The available information is collected from the sample registration system (SRS), vital registration system, several community based surveys and hospital based data. However, no single source is complete. Available estimates range from levels as high as 540 per 100,000 live birth for the year 2000 (World Health Report 2005) to 301 for the year 2001-03 (Registrar General of India, 2006) (37).

Fig-4
Trends in Institutional Deliveries as per SRS and NFHS data (37, 38)



India has a huge government health system comprised of PHCs, CHCs / Rural hospitals, district hospitals and medical college hospitals staffed by specialists, medical officers and nurses. These public health institutions together only conduct 16% of the total deliveries (NHFS-2). As seen in Figure 4, the increase in percentages of institutional deliveries is slow and there is wide variation between the two data sources. Institutional deliveries remain less than fifty percent. One of the main reasons is the change in program priorities in the country as the focus in the last two decades has largely been family planning and child immunization, neglecting delivery care. Even when delivery care and EmOC were brought back to the global agenda, the CSSM and RCH programs had too many diffuse interventions; the safe motherhood components were further neglected because of limited managerial capacity at district, state and national levels.

Recommendations for improving effectiveness of future safe motherhood interventions

Reduction of MMR requires greater convergent action to influence wider determinants of health care like female literacy, safe drinking water, sanitation, gender and social empowerment, early child hood development, nutrition, marriage after 18, spacing of children, and behavioural changes etc. Past safe motherhood programs and policies have not changed the maternal health scenario significantly in India. To ensure that the safe motherhood agenda is not neglected in the future, the following points need to be considered for any safe motherhood initiatives for MMR reduction in India.

- **Vital registration system and maternal death reporting for quality services:**

India needs to develop a system to accurately record all births and deaths. Reliable data about mortality can be generated cost effectively and be used to improve program inputs and to know the trends in mortality rates over the time. The system of maternal death reporting should be strengthened and each maternal death should be audited to improve maternal health services. Quality assurance systems such as use of evidence-based protocols and criteria-based audits need to be instituted in each facility.

- **Addressing Policy, programme priorities and Governance Issues:**
 1. **Evidence based and focussed strategy for reducing MMR:** Past experience has shown that attempting too many interventions with limited managerial capacity does not lead to success. Future programs should focus on specific evidence based strategies, such as skilled birth attendance for all births. This in itself is a challenging task in the extensive and varied infrastructure of the Indian health system. To make substantial progress, each level of health facility and provider must prioritise maternal care as one of the basic services. Primary health centres and community health centres should provide all the basic EmOC functions while first referral units and district hospital should provide comprehensive EmOC 24 hours 7 days a week.
 2. **Annual implementation plans and monitoring progress:** The state governments need to prepare annual plans to operationalize first referral units and increase skilled birth attendance. These plans should be closely monitored to measure progress. The supervision and monitoring should include assessing the functioning of the facility, their output and quality, based on appropriate indicators such as the UN process indicators for EmOC.
 3. **Improvement in co-ordination:** The project development process should ensure that all critical inputs such as staff, drugs and equipment are provided at strategically selected locations in a timely manner for achieving the objectives. It would also ensure that all the inputs are co-ordinated. There is need for coordination not only in the different arms of ministry of health and family welfare but also between different government/non-government agencies.

4. Improved management capacity and human resource development:

For any program to succeed, four critical inputs are needed – resources, management structure and systems, correct strategy and efficient implementing organization. Resources are always a constraint in any developing country. India has a large implementing organization in form of the public health system, even though its quality and accountability are major issues. The lack of progress in reducing MMR can be attributable to these incorrect strategies selected in India. Choosing a correct strategy is a top management function. If top management capacity is inadequate then selection of right strategy becomes difficult. The management capacity of district, state and national levels should be enhanced by management skill training for existing officers and recruitment of public health professionals. There should be clear policies for staff posting and transfer, delegation of authority and accountability. The objective of the policy should be to provide high quality care, 24 hours delivery and emergency services. Skill development and empowering medical officers, nurses and midwives for EmOC services even in the absence of an obstetrician, should be quickly and effectively implemented with functional referral system. The performance of each service provider should be reviewed by all the components of reproductive child health.

5. Improved Public Private Partnership and Regularization of

Private Sector: Public private partnership is on the agenda of Indian government to improve maternal health care but uniform process has not been identified to achieve it. There are no guidelines for PPP for maternal health services. The majority of institutional deliveries are taking place in the private sector and there is a need to regularize this sector to ensure quality of care without causing further hardship to the poor.

- **Generating Political Will and advocates for maternal health:**

Health needs to be a priority issue for politicians and maternal health in particular needs attention. Women's group need to take up issue of high maternal mortality as important issue to ensure government is focussed in its efforts to reduce maternal deaths. International development agencies and national level NGOs need to join hands with professional organisations such as FOGSI to make maternity safer in India.

Conclusion

India has progressed rapidly on the socioeconomic front but progress in improvement of maternal health has been slow. The review of safe motherhood efforts in India shows that in spite of major initiatives taken by the government in last 10 years, even today nearly half of all deliveries take place at home and antenatal care services coverage is poor and maternal mortality ratio remains around 300. The challenge is how to make safe motherhood strategies in the future more successful. High priority needs to be given to safe motherhood and have policy and programs designed to implement evidence-based strategies and detailed micro-level program planning. Strengthening EmOC should be the focus of safe motherhood strategy, along with ensuring skilled care at all the births. Monitoring effective implementation and measuring progress is essential for success. It will take at least 10-15 years of consistent, concerted and committed efforts towards improving maternal health to show results.

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Abbreviations

AMDD- Averting Maternal Deaths and Disability	IFA-Iron Folic Acid
ANC-Ante Natal Care	IMR-Infant Mortality Rate
ANM-Auxiliary Nurse Midwife	INC- Indian Nursing Council
ASHA-Accredited Social Health Activist	IPHS- Indian Public Health Standards
BPL-Below Poverty Line	JHPIEGO-Johns Hopkins
CDHO-Chief District Health Officer	LHV-Lady Health Visitor
CDMO-Chief District Medical Officer	MBBS-Bachelor of Medicine
CEmOC-Comprehensive Emergency Obstetric Care	Bachelor of Surgery
CHC-Community Health Center	MCH-Maternal Child Health
CMR-Child Mortality Rate	MMR-Maternal Mortality Ratio
CSSM-Child Survival and Safe Motherhood	MO-Medical Officer
CY-Chiranjeevi Yojana	MPW-Multipurpose Health Worker
DDG-Deputy Director General	NFHS-National Family Health Survey
DFW-Department of Family Welfare	NGO-Non Governmental Organization
DH- Department of Health	NHP-National Health Policy
DLHS-District Level Household Survey	NRHM-National Rural Health Mission
DoHFW-Department of Health Family Welfare	NSS-National Sample Survey
DP-District Panchayat	PHC-Primary Health Centre
EmOC-Emergency Obstetric Care	PHN-Public Health Nurse
FHW-Female Health Worker	PHU-Primary Health Unit
FOGSI-Federation of Obstetrics and Gynecology Societies of India	RCH- Reproductive Child Health
FRU-First Referral Unit	RMO-Registered Medical Officer
GOI-Government of India	SC-Sub Centre
GSACS-Gujarat State AIDS Control Society	SRS-Sample Registration System
HMIS-Health Management Information System	TBA-Traditional Birth Attendant
IAS-Indian Administrative Services	TFR- Total Fertility Rate
	UIP-Universal Immunization Program
	UNFPA- United Nations Population Fund
	USAID- United States Agency for International Development
	WHO-World Health Organization