



**Summer Training at
Indian Institute of Public Health, Gandhinagar (IIPH-G)
(March 28-May 31, 2014)**

**Understanding Organization Structure
&
“Mixed Method Study of „Three Delays“ in Maternal Mortality in Tribal
Rural Area of Gujarat.”**

**By
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**Under the guidance of
Dr. Vijay Pratap Raghuvanshi**

**MBA- Hospital & Health Management (MBA-HM)
2013-2015**



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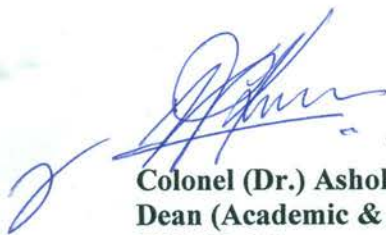
CERTIFICATE

This is to certify that **Dr. Vatsal Chhag (pt)** has completed the summer training at **Indian Institute of Public Health - Gandhinagar (IIPH-G), Gujarat** From 1.04.14 to 31.05.14 and was involved in the following projects under the guidance and supervision of Dr. D. Mavalankar and Dr. Kranti Vora at IIPH-G.

- **Project-1:** MATIND Gujarat: Quantitative studies of "Impact of Chiranjeevi yojana (CY) Programme.
- **Project-2:** Project on: Baseline assessment of practices of selected health issues in slums of Ahmadabad.

His approach to the projects has been sincere, scientific and analytical. This work is partial fulfilment to the course requirements, recommended for the Post Graduate Diploma in Health and Hospital with specialization in Health Management.

I wish him all the success in future endeavours.



Colonel (Dr.) Ashok Kaushik
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Preface:

The postgraduate diploma in hospital/health management (PGDHM) at Institute of Health Management Research (IIHMR-Jaipur) is two years programme. After completing 1st year academic session and attending 14 modules, student sent to an identified health sector organization for two month of training referred as Summer Training Programme (STP).

Main purpose of STP is to get exposure to functioning of the organizations. By this STP one should also understand the management structure of the organization and grass root level learning from various department of the organization.

Objective of STP:

- To understand health delivery system (public and private sectors) and functional units like Sub-Centre (SC), Primary Health Care (PHC), Community Health Centre (CHC), District Hospital (DH), Tertiary Care Centre (TCC), etc
- To have in depth knowledge of different field of operation of a health organization.
- To learn the roles and responsibilities of different functionaries and organizations effort for manpower development and deployment.
- To observe logistic system.
- The inputs for effective communication and marketing of healthcare institutes.
- To get deep insight of financial and budget management.
- To understand bottleneck and impediment encountered at different level of health sector in terms of human resources, supply management, change of behaviour & communication and maintaining information system, disease profile and components of effective patient care.

During STP, I had an overview of IIPH-Gandhinagar's organization structure and various programmes that conducted by it. Besides that I have also done field visits for maternal death review in rural area of Gujarat and conduct survey in urban slums of Ahmedabad. I also carried out small study with entitled "Mixed method study of 'Three Delays' in maternal mortality in tribal rural area of Gujarat." under guidance of Dr. D. Mavalankar and Dr. Kranti Vora. I also got the opportunity to work in CMHS department of IIM-A under guidance of Ms. Parvathi Raman.

Acknowledgement:

I extend my sincere gratitude to Dr. Dileep Mavalankar, Director Indian Institute of Public Health, Gandhinagar (IIPH-G), for giving me the opportunity to do this study and undergoing the process of learning at IIPH-G. I thank him for all the trust and faith he posed in me and I only hope that I have been able to live up to his expectations. His guidance and support was helpful in enhancing my work.

I extend sincere gratitude towards Dr. Kranti Vora, Associate Professor Indian Institute of Public Health, Gandhinagar (IIPH-G), who has been my mentor for the summer internship program & has been instrumental in helping me shape this study in a desirable way.

I would also like to thank Ms. Parvati Raman (CMHS dept, IIM-A), Dr. Sandeep Chauhan (Project manager, MATIND), Mr. Mayur Trivedi (Assistant Professor), Mr. Gaurav Kumar (Research coordinator), and Mr. Vijay Panchdhane (Senior programme officer) at IIPH-G for supporting my work all along and help me throughout my STP.

Last but not the least, I would like to thank the entire staff of Indian Institute of Public Health Gandhinagar, for their support and guidance.

I would like to express my sincere thanks to Dr. S.D. Gupta, Director, IHMR, my mentor Professor Vijaypratap Raghuvanshi, IHMR and Prof for the proper guidance and cooperation extended by him. I accept the sole responsibility for any possible error of omission and would be extremely grateful to the readers of this project report if they bring such mistakes to my notice.

List of Acronyms/Abbreviations

ANM	Auxiliary Nurse Midwifery
ASHA	Accredited Social Health Activists
AWW	Anganwadi Workers
BMNO	Block Medical Nodal Officer
BMO	Block Medical Officer
BPL	Below Poverty Line
CBMDR	Community Based Maternal Death Review
CMHS	Centre for Management of Health Services
CY	Chiranjeevi Yojana
DIC	Disseminated Intravascular Coagulation
DNO	District Nodal Officer
DST	Department of Science and Technology
EmOC	Emergency Obstetric Care
FBMDR	Facility Based Maternal Death Review
HDI	Human Development Index
HSSU	Health Systems Support Unit
ICMR	Indian Council of Medical Research
IIHMR	Institute of Health/Hospital Management Research
IIM-A	Indian Institute of Management – Ahmedabad
IIPHG	Indian Institute of public health- Gandhinagar
MCH	Maternal Child Health
MDG	Millennium Development Goals
MDR	Maternal Death Review
MMR	Maternal Mortality Ratio
MoHFW	Ministry of Health and Family Welfare
NHRC	National Human Rights Commission
OBC	Other Backward Cast
PHFI	Public Health Foundation of India
PPP	Public Private Partnership
SC	Scheduled Cast
SPSS	Statistical Package of Social Science
ST	Scheduled Tribal Cast
STP	Summer Training Program
TBA	Traditional birth Attendant

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Section-A

1. About Public health foundation of India (PHFI):

The Public Health Foundation of India (PHFI) is a public private initiative that has collaboratively evolved through consultations with multiple constituencies including Indian and International academia, state and central governments, multi & bi-lateral agencies and civil society groups. PHFI is a response to redress the limited institutional capacity in India for strengthening training, research and policy development in the area of Public Health.

Structured as an independent foundation, PHFI adopts a broad, integrative approach to public health, tailoring its endeavours to Indian conditions and bearing relevance to countries facing similar challenges and concerns. The PHFI focuses on broad dimensions of public health that encompass promotive, preventive and therapeutic services, many of which are frequently lost sight of in policy planning as well as in popular understanding.

The Prime Minister of India, Dr. Manmohan Singh, launched PHFI on March 28, 2006 at New Delhi. PHFI recognizes the fact that meeting the shortfall of health professionals is imperative to a sustained and holistic response to the public health concerns in the country which in turn requires health care to be addressed not only from the scientific perspective of what works, but also from the social perspective of, who needs it the most.

1.1) Vision of organization:

Vision is to strengthen India's public health institutional and systems capability and provide knowledge to achieve better health outcomes for all.

1.2) Mission of organization:

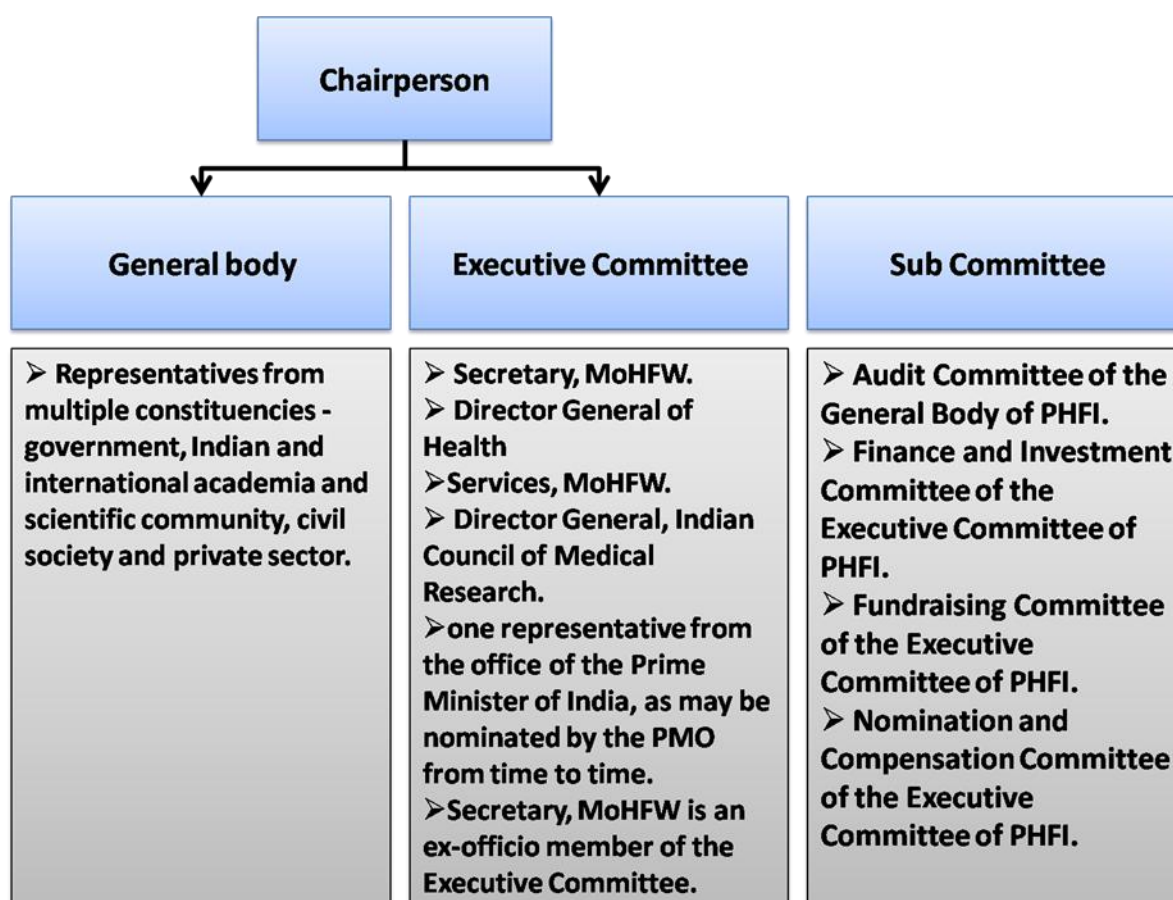
- Developing the public health workforce and setting standards
- Advancing public health research and technology
- Strengthening knowledge application and evidence-informed public health practice and policy

PHFI had set out its Charter focused on building institutional capacity in India for strengthening education, training, research, and policy development in the area of Public health.

1.3) The Charter goals:

- Establishing new institutes of public health.
- Assisting existing institutes to enhance their capacity and output.
- Promoting research in prioritised areas of public health to inform policy and empower programmes.
- Facilitating policy development, programme evaluation, and advocacy on public health related issues.
- Enabling the setting of standards in public health education.

1.4) Organization structure:



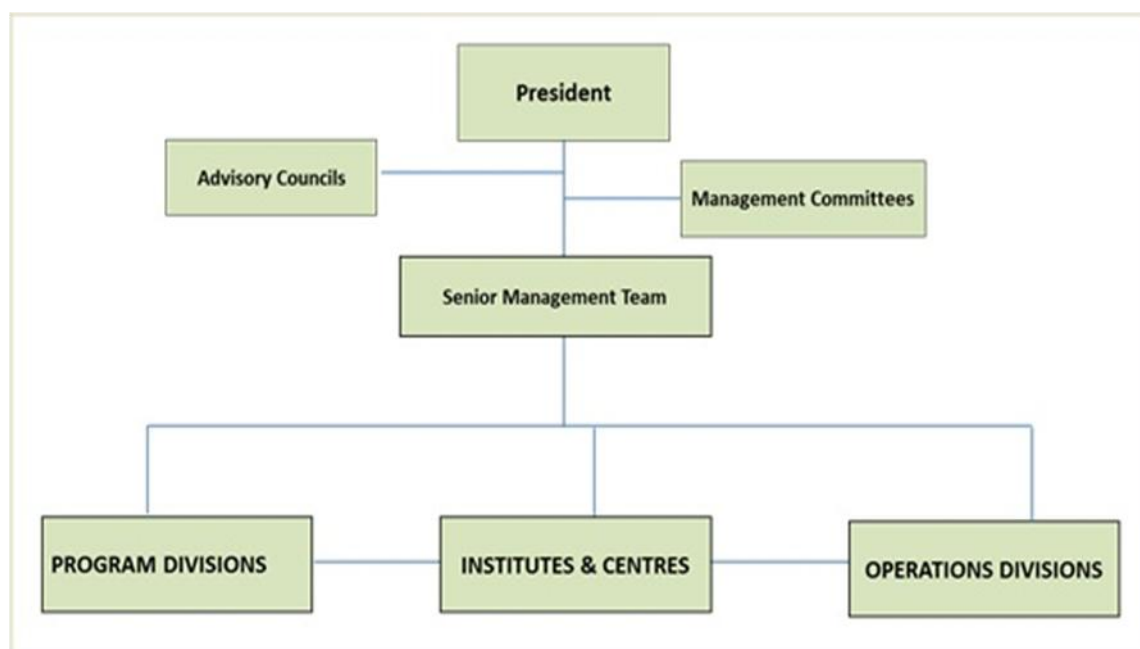
(Figure: A1) Organization structure

PHFI is an autonomously governed public private initiative registered as a Society under the Societies Registration Act 1860. The Foundation is governed by a fully empowered, independent, General Body (comprising of all the members of the Society).

The management of the affairs of the Society is entrusted to the Executive Committee, the governing body of PHFI that is elected by the Members of the society in accordance with the Rules and Regulations. The Chairperson of the General Body also chairs the Executive Committee. The President of the Society is a nonvoting, ex-officio member of the Executive Committee and holds the position of the Member Secretary. Sub-committees aid the functioning of the Executive Committee and General Body.

1.5) PHFI Management team:

- Academic Advisory Council
- Research Advisory Council
- Advisory Council at IIPHs
- Academic Management Committee (AMC)
- Institutional Ethics Committee (IEC)



(Figure: A2)PHFI Management team

1.6) Activities of PHFI:



Academic programmes:

The Public Health Foundation of India, through **the current network of four Indian Institutes of Public Health (IIPH)**, is delivering four full-time postgraduate diploma, and numerous short-term, courses. Besides the existing IIPHs, plans are on to launch more institutes in the next few years. An upcoming IIPH is at Shillong under the MOU with Government of Meghalaya

Public Health Training at PHFI

Capacity building in public health is one of the primary mandates of the Public Health Foundation of India. Besides the ongoing academic courses, there is a need for conducting short term courses/ in service training on various public health areas of topical importance. The Training Division at PHFI was established in 2008 with the goal of meeting the short term training needs of public health practitioners and professionals of the health and allied sectors in India.

Research & centre:

The Public Health Foundation of India (PHFI) from its inception is mandated to establish a strong national research network of public health and allied institutions which would undertake policy and programme relevant research that will advance public health goals in prioritized areas - with suitable international partnerships wherever useful and appropriate. In this direction, the research wing at PHFI has been undertaking projects in multiple areas of public health importance.

Research projects are done in collaboration with central and state government partners, national and international universities and institutions, and enable provision of direct and indirect inputs into national and state level policy

making. Major national funding agencies/partners include Ministry of Health and Family Welfare (MoHFW), Indian Council of Medical Research (ICMR), National Human Rights Commission (NHRC), Department of Science and Technology (DST), and some State level organizations.

Health Communication:

Public health advocacy action platforms are an equally critical requirement. The Health Communication and Advocacy Division (HCA Division) at the Public Health Foundation of India is involved in public health education, programmes and initiatives, training and research in consonance with National and State Health programmes and community needs.



(Figure: A3) Health communication

Major partners and funding are from **The Government of India**; Central and State, **Multilateral agencies** like UNDP, UNICEF, World Bank, WHO. **Donors** like MoHFW, UNDP, World Bank, The Bill and Melinda Gates Foundation, Packard Foundation, UNICEF, UNFPA, USAID, World Justice Project, MSD, European Union.

Health Systems Support:

The purpose of establishing a Health Systems Support Unit (HSSU) at PHFI is to leverage and learn from research, education, advocacy and training, and

provide a platform for offering technical support for strengthening initiatives across the country.

System support is essentially broad-based, sector-wide and long term effort with the following characteristics:

- Multidimensional
- Interconnected and interdependent monitoring indicators

HSSU will develop thematic health systems support projects for activities/geographies/stakeholders based upon:

- Standalone timelines
- Indicators, budgeting and funding support
- Ability to design projects along with a long-term roadmap

2. About IIPH-Gandhinagar:

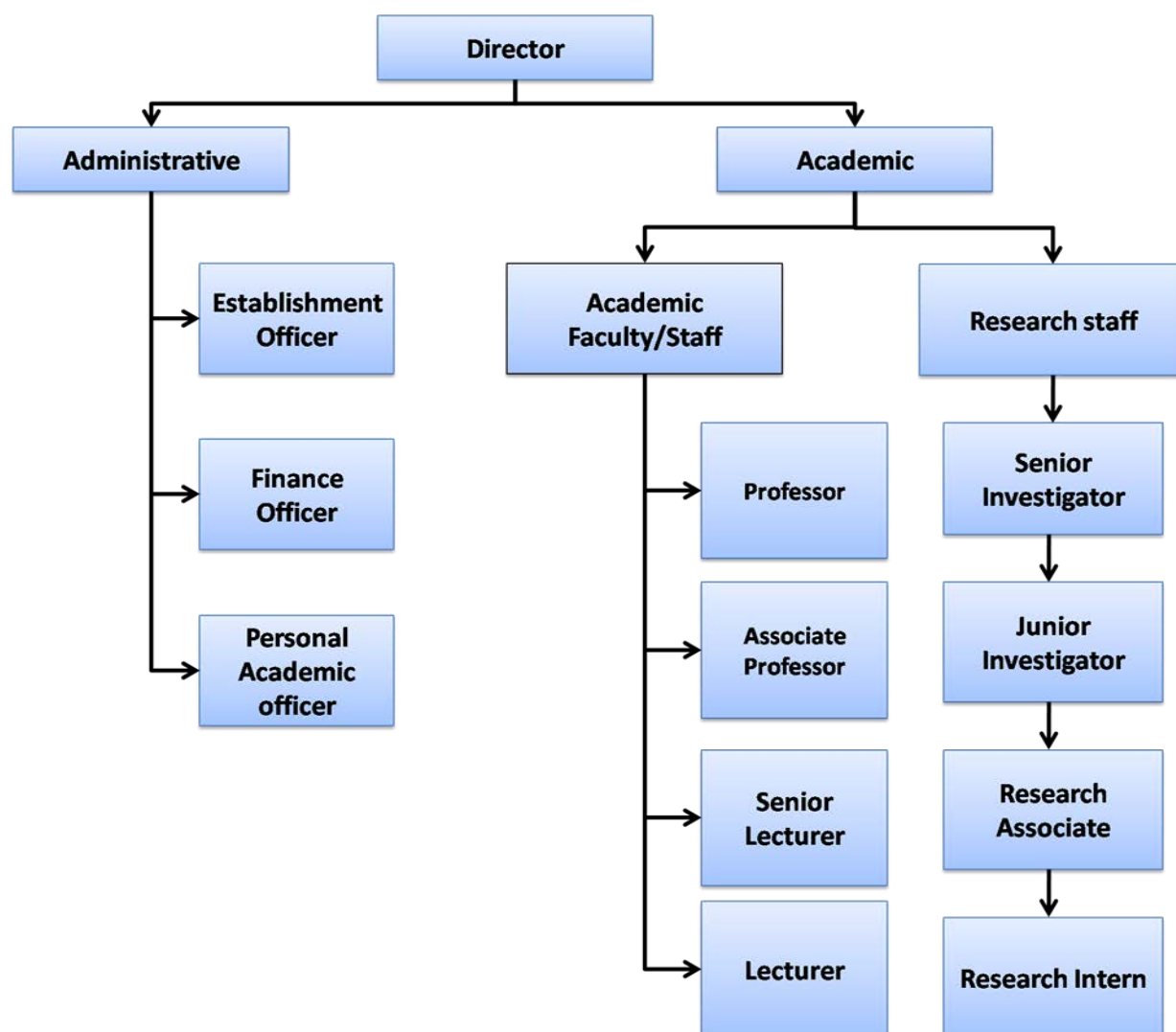
The Indian Institute of Public Health – Gandhinagar (IIPH-G) started on World Health Day – 7th April 2008. The first academic program that was, launched in July 2008 was called Post Graduate Diploma in Public Health Management.

In order to train in-service managers/ staff, the institute has been conducting short-term training programmes and workshops in various fields related to public health. The institute's activities have received funding support from NRHM/ Ministry of Health and Family Welfare, and Medical Council of India, CSIR, NABARD, Karoliska Institute, NRDC, IPH Bangalore, etc.

The faculty members are involved in several research grants/projects in the areas of MCH, disease surveillance, nutrition, micro-finance, monitoring health programs and advocacy, heat stress and health due to climate change etc. In addition IIPH G has developed research and academic collaborations with Karolinska Institute Sweden, Aberdeen University, UK, NRDC USA, Boston University, and Columbia University USA.

IIPH-G has also been providing research based health policy advice to Government of Gujarat. The faculty members are on various government committees, NGO boards and international advisory committees. They also help in teaching programs and conducting workshops at other IIPHS and other academic institutions.

2.1) Organization Structure:



(Figure: A4) IIPH organization structure

2.2) List of persons met during STP:

Dr. Dileep Mavalankar	Director, IIPH-G
Dr. Kranti Vora	Associate Professor
Ms. Parvati Raman	CMHS department , IIM-A
Dr. Sandeep Chauhan	Project Manager, MATIND
Mr. Mayur Trivedi	Assistant Professor
Mr. Gavurav Kumar	Research Coordinator
Ms. Shahin Saiyad	Research Associate
MR. Vijay Panchdhane	Senior Programme Officer

2.3) Tasks assigned at IIPH-G:

- Attend **EPI-Info** Data analysis system operating seminar.
- Literature review regarding MCH in Gujarat.
- Find references for MCH research work.
- Data entry, Rearrangement of variable and analysis on SPSS.
- Literature review and reference collection for research paper on Chiranjeevi yojana by Dr. D. Mavalankar.
- Finding of recent data of mortality rate of reproductive age group population in Gujarat for research paper work.
- Attend meeting on **School Health Consultation - Preparing Adolescent as Change agents of Health in Community.**

2.4) About Projects involvement during STP:

- 1.) MATIND Gujarat: Quantitative studies of “Impact of Chiranjeevi yojana (CY) Programme.

The ChiranjeeviYojana (CY) benefit package consists of cashless delivery facility to all women who are able to produce proof of belonging to Scheduled Tribes (ST) or Below-Poverty-Line (BPL) categories at accredited private EmOC facilities.

This community based study allows for the creation of counter-factual groups of program non-users in the community, thus enabling a range of comparisons between program users and non-users. This will study the prevalence of complications between

- Eligible (holding ST or BPL cards/documentation) program users
- Eligible (holding ST or BPL cards/documentation) program non-users
- Non-Eligible (not holding ST or BPL cards/documentation) non-users who are nevertheless poor
- A sample of Non-eligible (not holding ST or BPL cards/documentation) non-users who are not poor

Tasks accomplish during involvement:

- Attend **MDR audit** and field visits:
 - Block: Limdi, District: Surendranager.
 - Block: Devgadh-baria, District: Dahod.
- Wrote Case summaries and conclusion from MDR audit recording. Report on field visit and discussion observation.
- Entry of missing data in SPSS system.
- Wrote report on: “Mixed method study of Three ‘Delayed’ in maternal mortality in tribal rural area of Gujarat.”

2.) Project on: Baseline assessment of practices of selected health issues in slums of Ahemdabad.

This project has been conduct in partnership of IIPH-Gandhinagar and “Darpana Academy”. Basic object of this project is to provide awareness regarding health issue through interventions like street plays in urban slums of ahemdabad.

Sample population: Two urban slums “Kumbhaji chali” and “Mangal talav chapra” were selected for case and control group respectively.

Sampling technique: Snow ball technique: Respondent’s response was used for sample collection.

Data collection tool: Two questionnaire tools was developed by IIPH-Gandhinagar in which ‘Tool-A’ was for house hold with pregnant women child within one year of age, another ‘Tool -B’ was for the house hold adjoin to that household which is eligible for ‘TOOL-A’.

Tasks accomplish during involvement:

- Took training and done pilot study before conducting survey.
- Visit AWW and link worker at urban health centers.
- Participate sample listing and data collector for pre-intervention survey of case group of project.
- Work as data collector and supervisor for pre-intervention survey of control group of project.

Section-B

Report: “Mixed method study of ‘Three Delays’ in maternal mortality in tribal rural area of Gujarat.”

1.) Introduction and background:

Maternal death is saddest event as almost half million women die every year in this world mainly during pregnancy and child birth, and these deaths are avoidable with proper measurement and early action. For developing country like India high Maternal Mortality Ratio (MMR) is one of the major concern as almost 50000 maternal deaths were recorded in India in 2013 according to WHO report. Present scenario shows significant declined in MMR in last few years, according to Sample Registration System India's MMR reduce from 212 per 100,000 live births (2007-2009) to 178 (2010-2012) [1].

Gujarat Population is 6.04 Crore which is approximately 4.99% of total Indian Population, rural population in the state in 2011 was 57.4%, Gujarat's MMR reduce from 148 per 100,000 live births (2007-2009) to 122 (2010-2012) [1].

This declined in rate is appreciable but not enough to achieve millennium development goal (MDG 5). Millennium Development Goal 5 is to reduce the maternal mortality ratio by three quarters between 1990 and 2015 [2]. In spite of having Gujarat state government's initiative toward maternal death prevention like Janani shishu Kalyan Yojana (JSY) and Chiranjeevi Yojana (CY) and successful implantation of it, there is limited progress against high MMR.

Main cause of maternal death in India is haemorrhage with contributing 38% of total deaths [9]. Among other condition anaemia was main medical condition which leads to maternal death.

Reasons of failure in achieving expected efficiency and effectiveness in reduction of MMR are difficult to measure due to lack of information about underlying cause and factors of maternal death at facility, district, community, regional and national level that are needed to be identified and collected to reduce maternal deaths. Normally information which are collected through medical report only able to show biological cause of maternal death where as

other factors like personal, familial, socio-cultural, economic and environmental which remain undiscovered.

2.) Literature review:

Over the past decade interest in examining influences on care-seeking behaviour has increase. "Three delays" model is useful for to measure this care-seeking behaviour, it has mainly three components.

1. The delay in deciding to seek care.
2. The delay in reaching an adequate health care facility.
3. The delay in receiving adequate care at that facility.

Maternal death is a situation that can prevented by timely given medical treatment, but delays that occurs from all three phase can be fatal. These delays happen due to some factors which need to measure.

The first delay may be due to a lack of understanding of danger signs, the absence of the decision maker from the household. In country like India the low status of the woman especially in rural areas, cost, previous unsatisfactory experience with the health care system and perceived low quality of care. Also educational and social status of mothers and their family can affect on delay. [7]

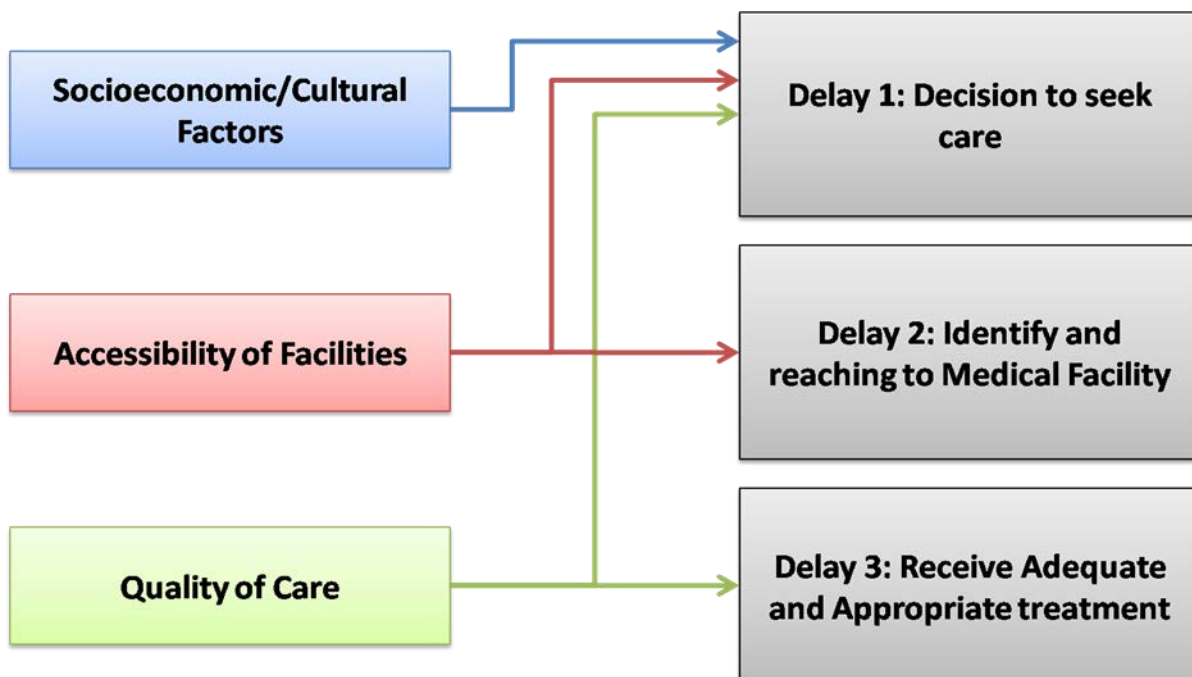
Second delay may be due to distance from facility, lack of transportation, difficult journey, difficult geographical area, bad weather and the high cost of travel. [3, 7]

The third delay mostly occurs due to inadequacies within the health system itself. It can be happen by lack of properly trained medical personal, transfusion equipment, and insufficient infrastructure. Late or wrong diagnosis and incorrect action by staff also major factor of this delay. [4, 7]

2.1) Three delayed model structure:

By doing in depth study and Analysis of maternal deaths can identify the delays that cause maternal deaths at various levels. For that Maternal death review (MDR) is most recent and effective initiative which can be

able to find and fill the information and throw a light on various missing factors that helps to improve MMR reduction.



(Figure: B1) Three delays model

3.) Rationale of Study:

Women's status is composed of the educational, cultural, economic, legal and political position of women in a given society. In developing country like India women's status generally underlies and that make women's access to health services more difficult especially in rural area, it directly creates the life threatening condition among mothers from this population.

This study helps to throw some light on the factors like socio-economic, cultural and environmental which are directly or indirectly responsible for delayed in taking preventive measures against maternal health of women.

Here we explore these factors by community level verbal autopsy. Identifying gaps in health system that need to fill to reduce maternal mortality, and also affects of these factors on three major 'delayed' that lead to maternal health crisis.

4.) Research questions:

1. What are the community level factors that can influence maternal mortality in rural area of Gujarat?
2. What are the major delays that lead to maternal death in rural Gujarat?
3. Is there a need to focus on the gaps and inadequacy in health system that can create hurdle in accessibility for maternal and child health care?

5.) Research objective:

- Explore the major socio-economical and cultural factor that lead to maternal mortality in rural Gujarat.
- Identify the main delays and its phase that can affect the most on maternal healthcare delivery.
- Find gaps and inadequacy in health care system and their solution that can help to reduce maternal mortality.

6.) Methodology:

6.1) Sampling design: Purposive sampling

6.2) Study area:

Aim of this was mainly focused on the tribal population in rural Gujarat, as these areas have less accessibility of maternal health care compare to other area of same state.

Three districts of Gujarat have been chosen for survey, which are Dahod, Banaskantha, and Surendranagar.

6.3) Socio-demographical detail of chosen area:

District	No. of block tracked	No. of Village Tracked	Population	Maternal Death
Dahod	3	47	104251	8
Sabarkantha	4	46	81263	4
Surendranagar	5	43	102514	2
Total	12	136	288028	14

(Table- B1)

6.4) Sampling method:

From each of three districts, 4-5 blocks were selected. all blocks with CY hospitals and adjacent blocks with no CY presence if needed. In each block about 20,000 population were covered. If village with more than 1000 population were selected then 10-20 villages will be identified in each block.

Villages having more than 40% BPL population and having more than 1000 population were randomly selected (as we are expecting about 20 births per year for 1000 population, villages having lower population will increase logistic burden and higher BLP population ensures capturing more eligible women.)

6.5) Sample size:

During data collection 14 maternal death were occurred in selected area and maternal death review audit was taken by MATIND project department, IIPH-Gandhinagar

7.) Data collection:

Purpose of this study was to explore the factors that cause maternal deaths which are normally difficult to identify with any bio-medical report, to accomplish this purpose community based verbal autopsy which is a type of maternal death review was suitable technique to collect data. Maternal death audit was conducted from April 2013 to May 2014 by MATIND project department, IIPH-Gandhinagar

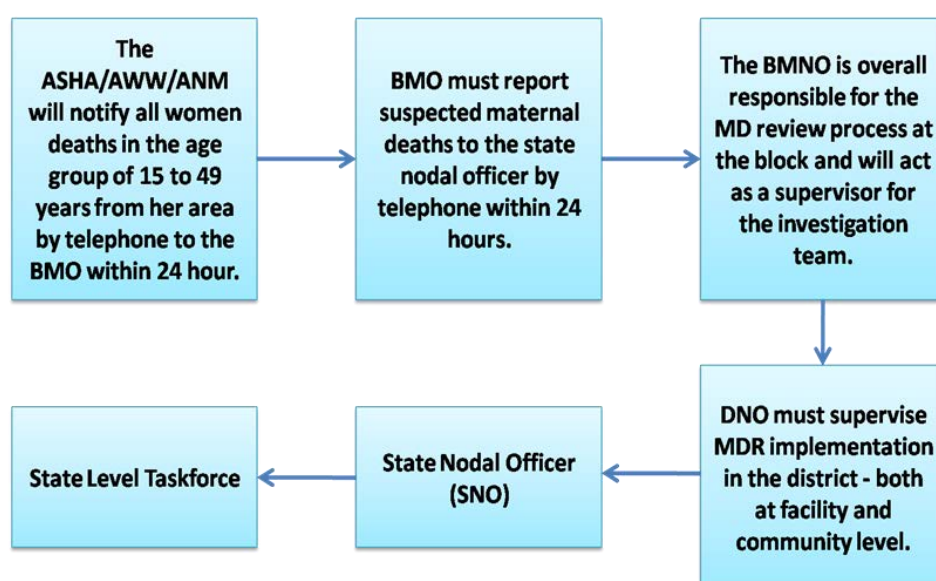
7.1) Data collection technique:

Technique like maternal death review (MDR) mainly base on strategy of detailed verbal autopsy questionnaire that can be done at community. Husband or family member who was present most of the time with deceased mother were expected to be participant for verbal autopsy and provide information regarding maternal death event, this will mainly help in capture the loops in the existing health care system and restructuring health services by prioritizing factors and redevelop intervention strategies.

“Community level verbal autopsy is structured verbal autopsy questionnaire used to interview relatives and those who were close to the deceased woman. The findings can be aggregated, and, based on the inferences drawn, corrective action taken at the block, district, state and national levels.” [5].

“Presently Government of India is using mainly two type of maternal death review that is Community based maternal death review (CBMDR) and the Facility based maternal death review (FBMDR) which would help in identifying the gaps in the existing health care delivery systems, prioritize and plan for intervention strategies and to reconfigure health services.” [6].

Steps of Community based maternal death review (CBMDR) by Government of Gujarat:



(Figure: B2) Steps of CBMDR by Gov. of Gujarat

However, data collection for this study was done by the MATIND project department at IIPH-Gandhinagar as part of project. Whenever maternal death occurred in selected area, data collector of MATIND project were informed by ASHA/AWW/ANM and data collector inform to district coordinator and project manager. Project manager is the one who is responsible for maternal death review (MDR).

7.2) Data collection tool:

For this study, Verbal autopsy questionnaire was taken which was developed by the Maternal Health Division, Ministry of Health and Family Welfare, Government of India.

According to government of India, Maternal death review guide lines, verbal autopsy questionnaire which contain open & close ended questions. These questionnaires were supposed to fill by interviewer according to respondents answer.

This tool mainly contain three modules,

1. General information of deceased mother.
2. Used if death occurred during abortion or prenatal period.
3. Used if death occurred during child delivery or postnatal period.

8.) Data consent form & confidentiality:

According to Government of India's guidelines for MDR interviews, all respondents have the right to determine for themselves whether or not they will participate in the interview. Also they must be at least 18 years old, to help ensure that they are capable of making this decision. Part of the job as an interviewer is to make sure they make them aware of 'consent form' and take approval by signature of respondents [6].

This means they were fully inform about the MDR and the interview process before asking any questions, also all respondents were fully understood the purpose and expected duration of the interview, the risks and benefits of being interviewed, and their right to not answer any or all questions [6].

Confidentiality: All information obtained from the MDR interviews remains strictly confidential. It is necessary to protect the respondents from any repercussions that might occur as a result of the information they have provided. It is also necessary to maintain the trust of the community and assure that people will be willing to talk openly to us about the maternal deaths.

9.) Data analysis:

For this study two type of data analysis done with two methods:

1. Descriptive data analysis: After retrospective data collection, quantitative data were analyzed by using SPSS analysis software, frequency and percentage of variables that present various factors, and show relationship between them.
2. Exploratory data analysis: data that obtained by community base verbal autopsy interview and its recording. Case stories that help to discover inadequacy and defects and the present scenario of maternal health care delivery system.

10.) Results and Discussions:

By this study total 14 maternal death reviews were conducted in tribal rural area of selected three district of Gujarat, all socio-economical and cultural factors were covered by verbal autopsy questionnaire.

10.1) Details of maternal deaths in April 2013–May 2014:

Total 14 deaths were occurred in selected rural area of three districts, those are Dhahod, Sabarkantha, Surendranagar.

- Eight deaths were recorded from Dahod district, four deaths from sabarkantha, and two death from Surendranagar.

- Seven mothers were from schedule cast (SC), and other seven were from Tribal cast (ST).
- Eleven mothers died in different health care centres (one in CHC, one in sub district hospital, one in district hospital, five in medical college and hospital, two in private hospital, and one in other health care institute).
- One died at home and other two on the way to facility.

10.2) Basic information about the mothers who died:

	No. of women (n=14)
Age group	
15-19 years	0
20-24 years	5
25-29 years	5
30-34 years	2
35-39 years	2
above 40 years	0
Education status	
Illiterate	6
Up to 8th std	8
Up to 12th std	0
Graduate	0
Social categories	
General	0
SC	0
ST	7
OBC	7

(Table- B2)

No. of ANC visits	
Nil	2
1	1
2 to 3	2
4 and above	9
Don't know	0

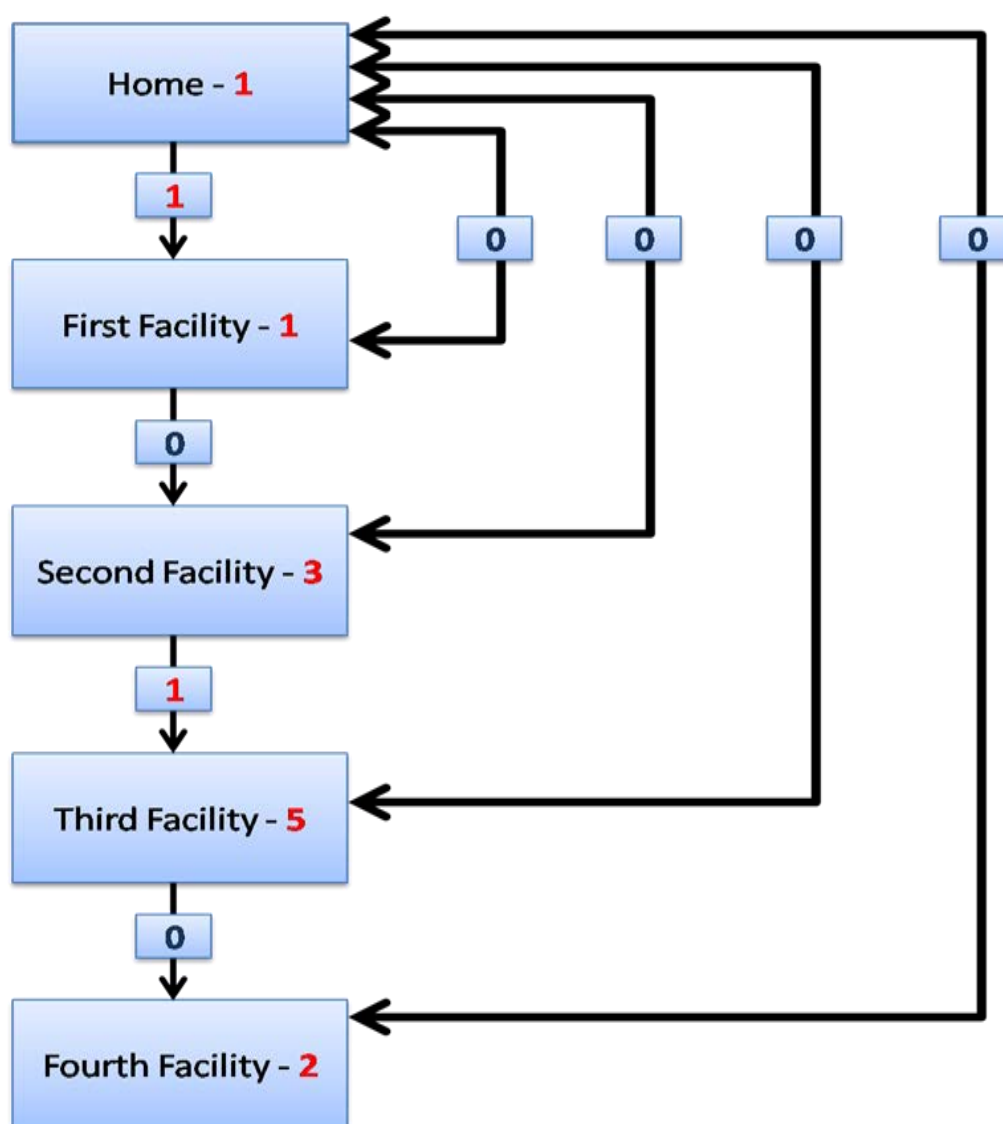
(Table- B3)

Above tables shows some general details about deceased mothers,

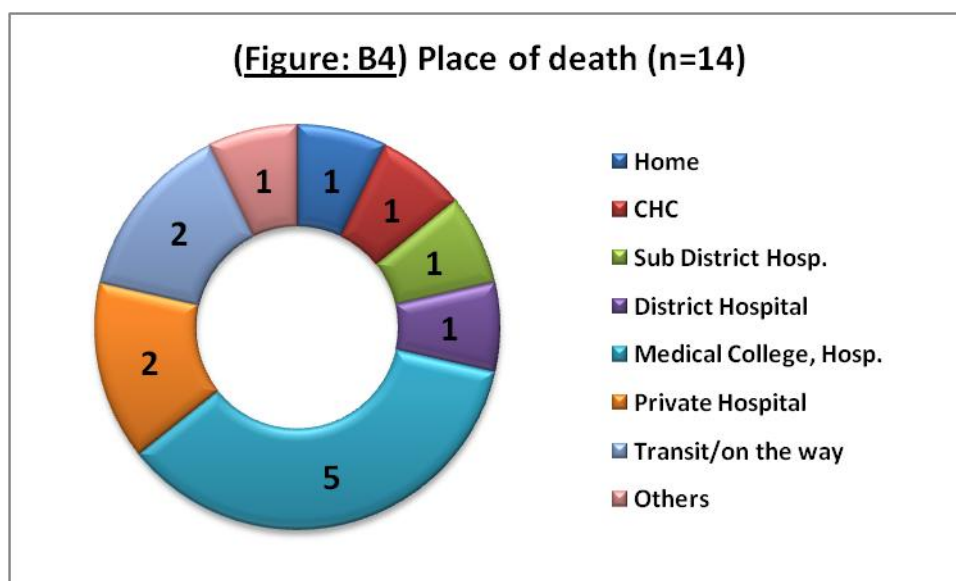
- 10 out of 14 mothers were in age between 20-29 years.
- All mother's education was not above primary level, from that six (43%) mothers were illiterate, this shows very low education level among women from tribal rural area of Gujarat.
- 7 mothers out of 14 (50%) were belong to Schedule tribal cast (ST) and other 7 (50%) were from other backward cast (OBC), this shows that

women from this social categories are more exposed to danger of maternal complications.

10.3) Road to maternal death:



(Figure: B3) Road to maternal death

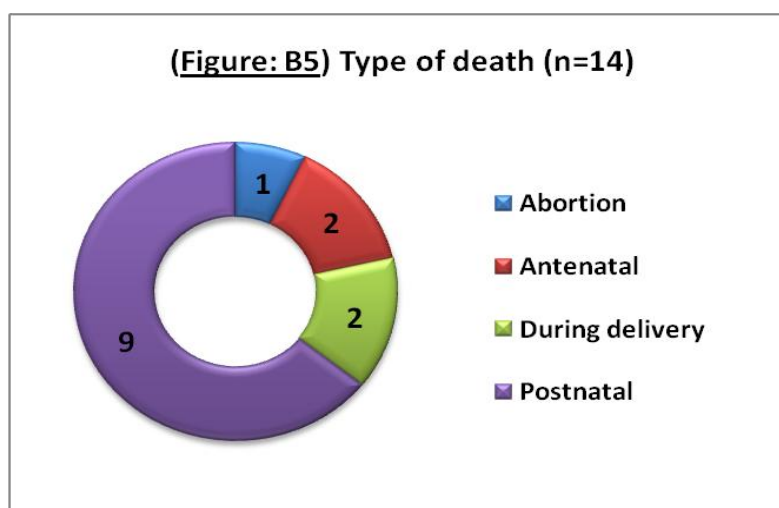


As per figure (B3, B4) shows that, out of 14 maternal death 1 died at home without reaching any healthcare facility, where as 2 died on the way to reach facility, while from rest 1 died in 1st facility, 3 died in 2nd facility, 5 died in 3rd facility and 2 died in 4th facility.

From 14 maternal deaths majority occurs after reaching 2nd and 3rd facility, as per three delayed frame work, most of mothers were able to get treatment at 3rd facility after attending previous two, also as per table () most of mother were died in tertiary health care centre (medical college and hospital).

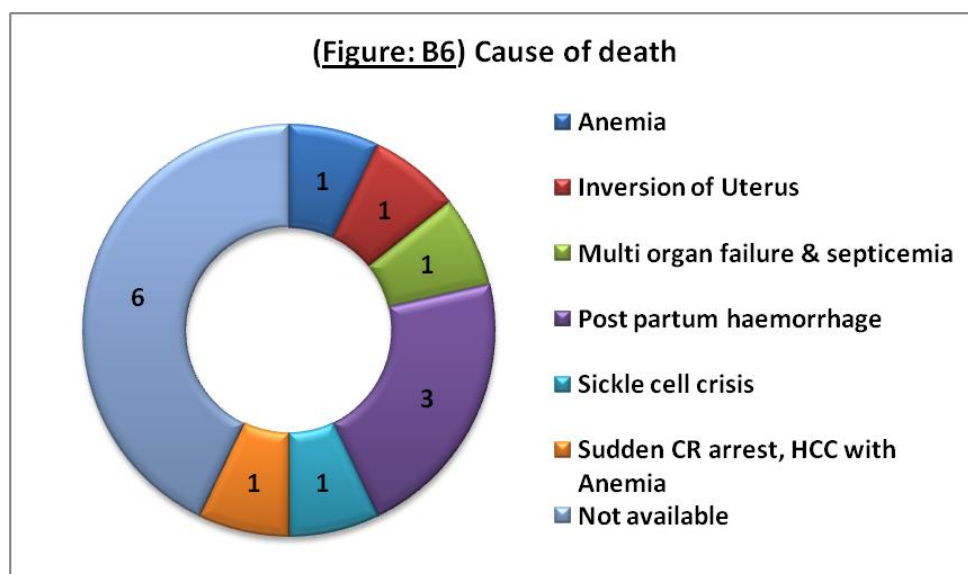
This situation may occurs by 2nd delayed that is delayed in referral to higher medical facility or by 3rd delayed that is lack of trained medical staff or late or wrong diagnosis and treatment.

10.4) Type and causes of death:



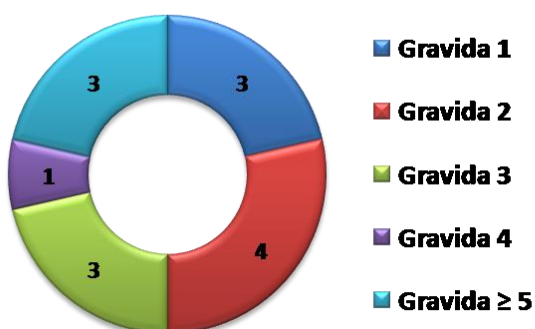
As per (figure: B5), it shows that majority maternal deaths in rural area of Gujarat were occurred in postnatal phase, which is 9 out of 14 mothers (65%). Focus on postnatal maternal health care is needed the most. Usually after delivery complication are need to rule out and treated, prenatal checkups are also equally important for early detection of any complication.

6 out of 14 cases, cause of death were not detected and if was detected was not informed to family members of deceased mother. Medical records were not available with family members as it may collect by medical officer or frontline workers for investigation,

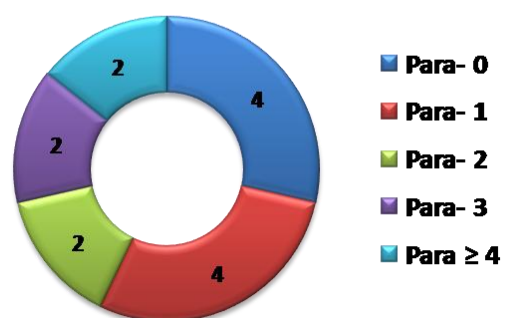


10.5) Maternal status of women who died:

(Figure: B7) Gravida

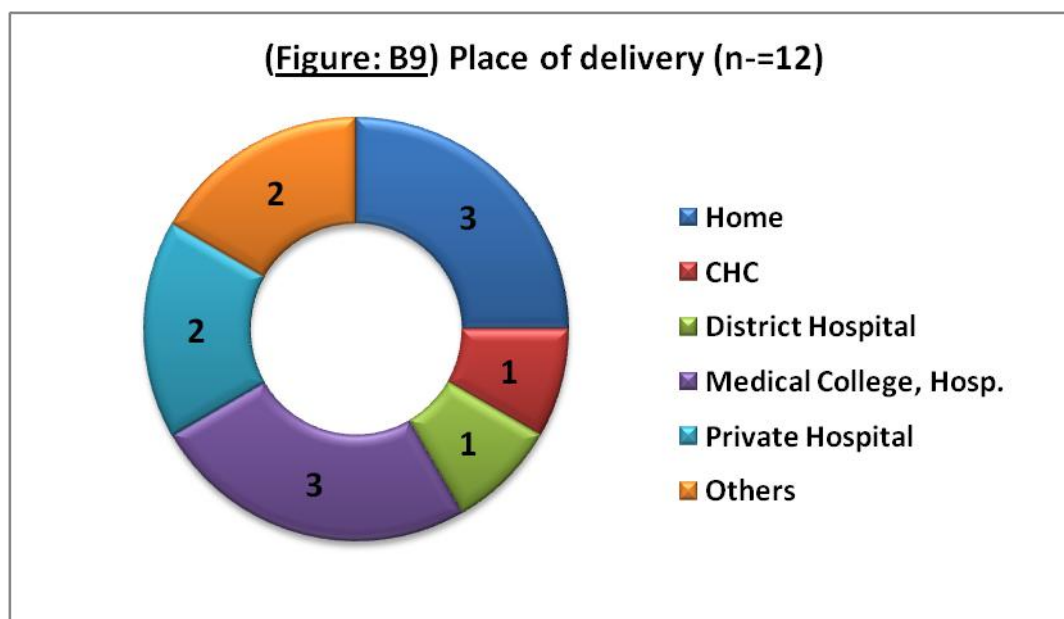


(Figure: B8) Para



- Seven out of 14 deceased mothers from given data were gravida one or two, and also 6 out 14 of mothers were 1 or 2 para, this shows that maternal death in this area is prone to occur in young women during their 1st or 2nd pregnancy.

10.6) Place of delivery:



As per (figure: B9), 12 mother (excluding two antenatal deaths), 3 went for child delivery at home while other 9 have gone through institutional delivery. This result shows that even after implication of health schemes like JSY and CY, one fourth of mothers from available data prefer to go for home delivery. Even if mothers prefers to go for institutional delivery they are not getting inadequate maternal health care, as 9 mothers from available maternal death review sample had chosen institutional delivery.

10.7) Expenses and Institution visits:

According to (Table:B4), information about expenses was available with 9 household of deceased mother out of them 5 household spend more than Rs. 25,000 in order to save mother's life, there was only 1 household got all life saving treatment of mother free of charge.

Also, (Table; B5) shows the number of medical facility visited by mothers before she died, there were 2 mothers who died without attending single medical institution. Furthermore there was 9 mothers out of 13 (data for 1 mother is not available) were attended more than 3 institute before she died and from them 2 mothers attended 4 institute before death.

Expenses (n=14)	No. of women
Nil	1
Rs. Up to 5000	2
Rs. Up to 10000	1
Rs. Up to 25000	1
Rs. Up to 50000	2
Rs. Up to 100000	2
Rs. >100000	
NA	5
Total	14

(Table- B4)

No. of institutions visited before death (n=14)	
No. of institutions	No. of mothers
0	2
1	2
2	5
3	2
4	2
NA	1

(Table- B5)

These results clearly direct that although there are public health facilities and government schemes for MCH and cashless healthcare services, utilization are very limited among needed population. Still BPL families have to pay for maternal care and pushed into debts in order to save the mother.

Also results shows that deceased mothers lives couldn't get saved even after visiting more then 2 to 4 facilities. This indicator directs the lack of facilities in medical institutions, inadequacy of trained men power and lack of decision making capacity for proper treatment and referral.

11.) Case stories:

1) District: Dhahod, Block: Devghadh baria

Respondent: Jayantaben's husband

Jayaben (Name changed), 27, female, resident of dudhiya village (block-baria), she was third time pregnant with history of one live birth (baby girl) and one stillbirth, and she went to her natal place devghad-bariya for delivery. She had complained of weakness, headache and giddiness throughout her pregnancy.

Her husband shared information that she was showing symptoms of jaundice 4-5 days before delivery, mild fever and chills were also present two days before pregnancy however no medical treatment was given to her and took her to temple for her wellness.

She went in labour pain at 11 o'clock in the night before she died (11/8/13). She delivered at home with help of TBA (Traditional birth attainer) and she gave stillbirth (baby boy) at around 1 o'clock. TBA was trained almost 25 years back and had no basic medical instrument for birth delivery, she used sterile blade to cut umbilical cord. Mother was complaining for stomach pain after few hours of delivery, and then she vomited and was blabbering semiconsciously and died after sometime around 4 o'clock in morning.

There was no medical record or documentation of her past medical history or treatment history available with her husband or relatives, she visited private hospital 2-3 times for prenatal check up with her husband, but neither husband nor relatives had information regarding mother's health status properly, No approach had been done to any health centre for any complain or precaution.

Conclusion: In this case home delivery by untrained TBA was not able to detect complication during or after delivery, normally after delivery TBA left immediately without any postnatal care instructions and emergencies. Status of women in such scenario play major role in maternal death, care seeking decision is taken by head of the family which create the 1st phase delayed that lead to maternal death. Here her prenatal illness was not treated medically and after delivery complication, no action was taken by family. Reason to this non medical approach and against care-seeking behaviour can be due to socio-economical status of family, lack of awareness and also can be by lack of medical facility nearby. Also there is no proper documentation and record of prenatal checkups that may detect and rule out complication.

2) District: Dahod(1), Block: Fatehpur, PHC: Madhava
Respondent: Radha's Husband, Radha's Mother

Rekha (Name changed), 30 year old female, agricultural labourer from Dahdhela village, she had maternal history of getting 5 times pregnant (including her last pregnancy before she died) with 4 live births. According to her husband during her 5th pregnancy she had no complication or complains. She was not going for regular prenatal checkups or immunization.

In early morning (4:00 am) her water breaks but there was no pain, she was taken to the private hospital (5:30 am) in 108 ambulance, where her delivery took place after half hour (around 6:00 am) and gave birth of child (baby girl) . According to her mother's information, delivery was normal but doctor inform to her relatives that there is uterus ruptured and they have to remove it, due to unavailability of procedure facility they referred her to another hospital for further treatment, so she was taken to private hospital along with two nurses. (Treatment cost: Rs. 2500, Transportation: 1000)

To another private hospital (around 8:30 am), blood transfusion was done but they advice to took her to civil hospital. (No charge taken by private hospital)

Her family decide to take her to the civil hospital as per advice, but she died on the way during transportation (around 9:00 am). (Transportation charge Rs.1550) She visited 2 institutions before death, she gave birth of child (girl) who died within 24 hours after delivery, and total expenditure cost was around Rs.5000 mainly on transportation.

FYI: According to gynaecologist at 1st facility, she was in disseminated intravascular coagulation (DIC).

Conclusion: she was fifth time pregnant with four children alive by previous deliveries, this shows the insecurity child survival and son preference is still major concern in rural population. Use of ambulance for EmOC has increased but still not available every time. Here diagnosis were done on time but lack of facilities that can do life saving procedures, also delayed in referral make the condition worse. Lack of infrastructure and equipments at health care facilities make them useless even if they exist.

3) District: Dahod, Block: Devghadh baria, PHC: Bainakuva
Respondent: Anita's mother

Nitaben (Name changed), 24 year old female labourer from Redhana village, according to her maternal history this was her 2nd pregnancy, she had a child from previous delivery, according to her mother she had no complain during her pregnancy. She was never gone for prenatal checkups and immunization.

She gave normal delivery in noon (12:00 pm) at home with help on TBA (delivery charge around Rs.650), she gave birth of healthy child (baby boy). On the same night of delivery she vomited twice followed by unconsciousness.

She was taken to the private medical centre in next morning (4:00 am) as vehicle was not available, during her treatment she starts showing convulsions. Then she was referred to civil hospital. (Treatment cost: 1600, Transportation: 400)

She was taken to civil hospital in 108 ambulance (paid Rs.200), from there she was referred to another civil hospital. She was taken there in the same morning around (11:00 am) (No transportation cost)

From there she was again referred to the government medical college as her health was getting critical. In same day afternoon (1:00 pm), she was admitted there in ICU and treated. she died in hospital in noon after fourth day of admission (12:00 pm). (Treatment cost: Rs.9000, Transportation of dead body to home: 2500)

She visited 4 institutions before her death, patient relatives don't know the cause of death and all medical documents were submitted to the same hospital. Total expenditure on transportation was around Rs. 2700 (Including 108 ambulance charge Rs.200) and Rs. 10600 on treatment.

Conclusion: In this case, mother never gone for prenatal checkups, after delivery at home postnatal complication occurred but due to lack of transportation or lack of awareness of ambulance services, and delayed in care-seeking decision, lead to prevention of getting treatment on time. There was no proper diagnosis and any treatment protocol applied till she reached to fourth medical facilities and even after getting tertiary health care she didn't survive may be due to inadequate treatment or late treatment, this shows the lack of diagnosis on time or delayed in diagnosis, also lack of trained medical staff are major reasons of her death. Today even after reaching to proper medical facility, quality care was not provided on time and preventive measures were not been taken to save mother.

4) District: Surendranagar(3), Block: Wadhwan
Respondent: Sonalben's mother-in-law

Kusumben (Name Changed), 21 year old female from karangadh village, she was agricultural labourer, it was her first pregnancy. As per her family member's verbal information, she was going for regular prenatal checkups in private hospital every month, also she was attending 'mamata din' at VHND regularly (around 7 times).

Day before the day of delivery she went for check up to private hospital. On the day of delivery she went to same private hospital with complains of mild fever and breathlessness in morning but as doctor refused to treat her.

she was shifted to another private hospital at around 4:30 pm, where after some medical tests doctor referred her to medical institute for further treatment o same day evening at 8:30 pm , here she normally delivered a healthy child on same day (baby girl) (10:30pm).

After delivery she complains of breathlessness, stomach pain and mild fever, after 4 days treatment she was shifted to district general hospital in evening at 4:00 pm. There she was admitted and treated for 2 days before she died (1:30pm).

As per Govt. Medical Officer (Who had seen the case papers), reason of death were Jaundice and multi organ failure with septicaemia. She visited 4 institutions before death, total expenditure on her treatment was around Rs.50000 and on transportation was 5000.

Conclusion: In this case even after regular prenatal checkups, complication remains undetected. Available private health centre fail to follow standard referral protocol. Delayed in diagnosing and providing needed treatment, this clears the picture of deficiency in our health delivery system. Mother died even after visiting four institutes and after getting tertiary healthcare. Unavailability of trained medical staff and proper infrastructure is one of the main reasons of this delayed.

Section- C

Conclusion:

After the analysis of available data and case stories that are studied, maternal status in rural Gujarat is still need get improve a lot, of course there are some progression happen in maternal health care delivery in Gujarat but that is not sufficient.

Data analysis shows that all three delayed are present in some or other way and connected to each other, these delayed are major cause of preventable maternal deaths.

Lack of maternal care-seeking behaviour among population still exist, people need to get more awareness and education regarding maternal complication and its severity especially among women. Socio-cultural status of women is need to get improved for positive behaviour change and improve decision making ability when it's come to maternal and child health.

Poor socioeconomic and education status of rural population and low women status in society, lack of institutional delivery preference, irregular prenatal checkups, improper records and follow-ups of pregnant women are the main reasons of early detection of maternal complication and delayed in care-seeking decisions in rural area of Gujarat.

Presently transportation facilities has improved and ambulance services like 108 also become very helpful factor to reduce maternal deaths, but still in some remote tribal area difficulty in getting transportation on time is one of the major hurdle to get maternal care. Delayed in decision making for seeking of care and reaching to proper medical facility is major problem which lead to risk mothers' life. Cost of transportation among poor population is also major concern before approaching to medical facility.

Third delayed that is delayed receiving appropriate treatment and quality mother and child care has majorly seen in most of cases from available samples. Lack of trained medical staff at primary level facilities, lack of regulation and update of maternal health of pregnant women in their area, lack of proper life saving protocol for mothers, lack of proper equipments and transportation, these all factors leads to late or wrong diagnosis or sometime no diagnosis and that prevent effective quality treatment to needy mother on time.

Some **Suggestions** that can be helpful to reduced affect of above discussed factors are,

- Improve the quality of life of people from tribal rural areas mainly women, improve social-cultural status of women by woman development programmes.
- Regular maternal death reviews and investigation to identify the probable cause of deaths as in most of them remain undetected mainly in tribal rural population. Proper monitoring and regulation for medical record of deceased mother for every medical facilities.
- Proper tracking and monitoring of pregnant women especially in rural area by frontline health workers and make mothers aware and educate about antenatal care and postnatal care by focused counseling.
- Early detection of maternal complication during pregnancy and correct referral should be given by medical personal during mother's prenatal checkups.
- Rule out major causes of maternal death, mainly anaemia and other indirect cause and treat them before it create maternal complication.
- Improve transportation that is easily accessible and affordable mainly in private facilities; make people aware about ambulance services like 108.
- Improve quality of care by specific Training regarding child birth and postnatal complication and early detection for TBA and also for medical staff of public or private medical facilities.
- Create public private partnership (PPP) with private practitioners; provide incentive and benefits to make them follow standard treatment and referral protocol for maternal case.
- Monitoring schemes like JSY and CY for its proper implication so that every eligible mother can get benefit from it.

References:

1. Sample Registration System (2009-2012)
2. United Nations, Millennium Development Goals website:
[<http://www.un.org/millenniumgoals/>].
3. Kesterton *et al.* *BMC Pregnancy and Childbirth* 2010: Institutional delivery in rural India: the relative importance of accessibility and economic status. Amy J Kesterton, John Cleland, Andy Sloggett and Carine Ronsmans.[<http://www.biomedcentral.com/1471-2393/10/30R>].
4. Article on “three delayed as framework for critical analysis of mother near miss and maternal mortality. Saira Yunus, Shahanaz Kausar, Shazia Ali. Journal of south Asia federation of obstructive and gynaecology, [may-august 2013]
5. Maternal and prenatal death inquiry and response, UNICEF.
6. Maternal death review guide book, Maternal Health Division Ministry of Health and Family Welfare Government of India.
7. TOO FAR TO WALK: MATERNAL MORTALITY IN CONTEXT, Sereen Thaddeus’ and Deborah Maine.
8. Maternal Deaths in Underserved Areas of Gujarat State, Smita Bajpai, CHETNA Regional Resource Centre (CRRC).
9. Midwifery & maternal Health in India, Published by CMHS department of IIM-A.