Prevalence and determinants of postpartum morbidities in rural block of Jhagadia, Bharuch, Gujarat.

Ms. Gayatri Giri

Dissertation submitted in partial fulfilment of the requirements for the award of the degree of Master of Public Health

Achutha Menon Centre For Health Science Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology
Thiruvananthapuram, Kerala, India

October 2009

DECLARATION

I hereby declare that this dissertation work titled **"Prevalence and determinants of postpartum morbidities in rural block of Jhagadia, Bharuch, Gujarat"** is the result of an original research and it has not been submitted for the award of any degree in any other institution.

Ms. Gayatri Giri

Thiruvananthapuram, Kerala **October 2009**

Certificate

I hereby certify that the work embodied in this dissertation titled "Prevalence and determinants of postpartum morbidities in rural block of Jhagadia, Bharuch, Gujarat", is a bonafide record of original research work undertaken by Ms. Gayatri Giri in partial fulfillment of the requirements for the award of the Masters of Public Health degree under my guidance and supervision.

Guide:

Dr. Mala Ramanathan
Additional Professor
Achutha Menon Centre for Health Science Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology
Thiruvananthapuram – 695011 Kerala, India.

October 2009

ACKNOWLEDGEMENT

At the outset I would like to put on record my deep sense of appreciation for the unconditional support and the great contribution from the respondents for having given voice to personal postpartum morbidity in the prevalent culture of silence.

I would like to express my deep sense of gratitude to my guide Dr. Mala Ramanathan, Additional Professor, AMCHSS for providing invaluable guidance at the every stage of this study. My special thanks to my co-guide Dr. Pankaj Shah for the guidance and facilitation of provision of organisational support for my stay at SEWA-Rural for the field work.

I wish to express my heartfelt thankfulness to the entire faculty Dr. Ramankutty, Professor, Dr. P. Sankar Sarma, Additional Professor, Dr. K.Srinivasan, Associate Professor, Dr. Biju Soman, Associate Professor and Dr. Manju R Nair, Senior Scientist, for the critical reviews and valuable suggestions from time to time.

I am indebted to and humbly convey my special thanks to Dr. K. R. Thankappan, Professor and Head, AMCHSS, Dr. K Mohandas, Ex-Director, AMCHSS, SCTIMST and Dr. K. Radhakrishnan, Director, SCTIMST for providing me an excellent opportunity to be a student at the premier Institute and to complete the study.

I am grateful to Shri. Sundar Jaisingh, Deputy Registrar for facilitating all the administrative support both for my studentship and the study.

The dissertation would not have seen the light of day without the thorough and sustained support from all field investigators who untiringly carried out field work in interior villages in various difficult circumstances. I would like to especially thank Mr. Shailesh, Ms. Madhuri, Ms.Veena, Mr. Kamlesh, Mr. Nilesh and Mr. Ramesh, and all other staff of

SEWA-Rural who provided all the support even beyond their duty hours. The members of their families especially the children made my stay at Jhagadia a memorable one.

I would be failing my duty if I do not acknowledge the help provided by Dr. Dhiren Modi and Dr. Shobha Shah in diagnosing the cases and facilitating day to day activities in the field. I would like to gratefully acknowledge the contributions of Ms. AR Archana, Research Officer, AMCHSS, SCTIMST, who helped me to understand the data structures and the analysis required.

I owe warm personal thanks to Prof. Sundari Ravindran, Honorary Professor, AMCHSS for being an inspiration for my professional pursuits in the field of public health and encouraging me to study relatively unexplored issues- having public health relevance.

Dr. Maya Hazra, Ex-Professor and Head of the Department of Obstetrics & Gynaecology of Sir Sayaji Rao Gaikwad Hospital and Government Medical College of Baroda, made me learn the nuances of community obstetrics both at the government medical college, Vadodara and at SEWA-Rural Jhagadia. I do not have words to communicate my feelings for her continued support and extremely useful feedback on the study undertaken.

The then Principal Secretary (Family Welfare) and Commissioner (Health and Family Welfare), Government of Gujarat Dr. Amarjit Singh, IAS has always been a source of inspiration and sustained motivation for affirming my faith in the system; its capacity to reach the unreached. I would like to take this opportunity to express my deep gratitude to state government for granting permission to carry out this study in Gujarat and its keenness to know the findings of the study for programme improvement.

Dedicated to

All my professional endeavours including my present study are dedicated to my late parents who taught me the importance of education, empathy and sensitivity for people, commitment and dedication to the cause of women's health, confidence in self and due respect for humankind by being role models.

ABBREVIATIONS

AMCHSS	Achutha Menon Centre for Health Science Studies
ANC	Antenatal care
ANM	Auxiliary Nurse-Midwife
APH	Ante partum haemorrhage
ASHA	Accredited Social Health Activist
BOC	Basic Obstetric Care
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CHC	Community health centre
CSSM	Child Survival and Safe Motherhood
DALYs	Disability Adjusted Life Years
EmOC	Emergency Obstetric Care
FRU	First Referral Unit
ICPD	International Conference on Population and Development
MDG	Millennium development goal
MMR	Maternal Mortality Ratio
NFHS	National Family and Health Survey
NGO	Non- governmental organization
NRHM	National Rural Health Mission
PHC	Primary health centre
PNC	Postnatal care
PPH	Post-partum haemorrhage
SC	Scheduled caste
ST	Schedule tribe
SLI	Standard of Living Index
WHO	World Health Organisation
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund

TABLE OF CONTENTS

ABSTRACT

Background: Postpartum morbidity is an issue of public health relevance interwoven with maternal mortality and disability. The study estimated the prevalence of self reported postpartum morbidity and its determinants among women aged 18-49 in a rural block of Gujarat.

Methods: A community based cross-sectional survey was conducted among 514 women in the reproductive ages that had a delivery between April-June 2009 in Jhagadia, Gujarat. Demographic characteristics, social-economic status, obstetric history, self reported morbidity during postpartum and health seeking behaviour were studied through pre-tested, semi-structured interview schedule.

Results: Amongst the respondents, the prevalence of antenatal morbidity was 52.0 percent, intrapartum morbidity 41.0 percent and postpartum morbidity 48.6 percent. The women with intra-partum problems had also experienced antenatal problems. The women who did not have problems in the antenatal and intrapartum period were more likely to experience postpartum morbidity.

The scheduled caste women had least postpartum morbidity (33.9%). It was higher amongst schedule tribe (51.1%) and other backward castes (50.0%). Anaemia was the most frequently reported condition during antenatal period and postpartum period inspite of high (97 %) levels of IFA intake. Caste is a strong predictor for morbidity in all the periods – antenatal, intra-partum and postpartum. Women of other backward castes who did not have an institutional delivery had a greater chance of having intrapartum complications. There were 24.7 percent of women who had postpartum morbidity with neither antenatal nor postpartum problems.

Conclusion: To reduce the prevalence of postpartum morbidity (found to be quite high in the study); determinants like lack of utilisation of health services in the antenatal and intrapartum period have to be addressed particularly among minority groups. Anaemia increases women's vulnerability to other problems. A strong health system focus targeting every woman to be at risk for postpartum complications and particularly women among minority groups is called for.

CHAPTER 1
INTRODUCTION

1. Introduction

"*Governments have the capacity to improve and save women's lives, their failure to do so, is an abdication of their duty to ensure women's enjoyment of the rights to life and health*".[1]

-Centre for Reproductive Rights, 2008

Inspite of having governments pioneering initiatives to promote safe motherhood, still India accounted for at least a quarter of maternal deaths reported globally and many more hidden maternal morbidities. Due to geographical vastness and socio-cultural diversity maternal mortality varies across the states, within states, districts and in community at large.[17] Health systems strengthening in isolation will not be able to make a dent in the gigantic problem. It is essential to supplement that with a strong political commitment-managerial effectiveness, meaningful and relevant partnerships with civil society organisations and a strong focus on the central role of the community in designing of appropriate interventions to improve maternal health.[2]

1.1 Background

For every woman who dies due to pregnancy, childbirth or unsafe abortion, there are 20-30 who endure injury, infection disease and disabilities that cause lifelong suffering.[3] Over 300 million women in developing countries suffer from short or long term illnesses brought about by pregnancy or childbirth.[4] India's maternal mortality ratio of 301/100,000 live births translates into about 80,000 women dying annually during pregnancy, childbirth or shortly thereafter.[5] Every 5 minutes, one woman somewhere in India dies from complications of child birth. The 65% of deliveries still occur at home. Of all pregnant women in India 15% develop life threatening complications. Of 60 percent of all maternal deaths occur after delivery but only one in six women receive postnatal care.[6] Many families that experience deaths believe that it was in women's 'fate' to die in childbirth process. If all these women had access to appropriate health care, seventy five

percent of the totally avoidable deaths could have been prevented.[7] Only 37% of mothers had a postnatal check up within 2 days of birth and most of the mothers receive no postnatal care PNC. [8] Early PNC can reduce maternal mortality and morbidity.

Gujarat's Maternal Mortality Ratio is 172/100,000 live births.[9] Infant Mortality Rate is 52.[10] Total Fertility Rate is 2.42.[8] The proportion of mothers who receive PNC within 2days for their last birth is 54.0% (urban-72.7%; rural-43.8%).[8]

Bharuch is one of the oldest of the 26th districts of Gujarat State. SEWA-Rural is a leading NGO supplementing the health care services being provided by the governmental health centres in the Jhagadia taluka which is a predominantly tribal block of Bharuch district. In the field operational areas of SEWA Rural, 55 percent of total deliveries are home deliveries while institutional deliveries are 45 percent. Out of total institutional deliveries 70 percent of the deliveries are conducted at the SEWA-Rural hospital.[11]

1.2 Global and Indian Situation-Facts and Figures

Cause of maternal death global: The major global burden of maternal deaths is due to obstructed labour-11%, eclampsia-16%, unsafe abortion-18%, infection- 21% and haemorrrhage-34%.[12] The risk of woman dying because of pregnancy or childbirth ranges from one in six in Afghanistan and Sierra Leone to one in 100 in India and one in 17,400 in Sweden.[13] The studies conducted in developed countries like UK and Canada shows incidence of sever obstetric morbidity ranging from 12 to 4.38 per 1000 deliveries.[14,15] Globally for every woman who dies approximately 20- 30 women suffer injuries, infection and disability.[12] Maternal death is like a tip of an ice-berg, hiding the grim reality of maternal morbidities.

South East Asia Region (SEARC): In these countries births attended by skilled health personnel varies, 13% in Nepal to 98.6% in DPR Korea while it is 42.3% in India.[16]

Major Cause of Mortality: A major cause of maternal mortality in rural India is Anaemia-24%, postpartum haemorrhage-23%, Abortion-12%, Toxemia-12%, Puerperal sepsis-10% .[17]

Major Causes of morbidity: In India, various studies conducted in Haryana, Andhra Pradesh, Maharashtra show a prevalence of postpartum morbidity of 74%, 61% and 42.9% respectively.[18,19,20] The NFHS-II reports 14.8% prevalence of self reported postpartum morbidities. The major reported morbidities were weakness, lower abdominal pain, perineal pain, abnormal vaginal discharge, high fever, excessive bleeding, discharge smells, breast problems and insomnia from 7.4%-43%.[18,19,20] Other studies from Chennai and Goa show postpartum depression of 33.4% and 23% while psychosis is 6.5%.[21, 22]

Hospital level study on Postpartum morbidity: A hospital study conducted in Zambia shows puerperal sepsis-34.8%, Malaria-14.5% and pneumonia-6%.[23] The major morbidities reported in studies conducted in tertiary care hospital in Wardha and Delhi on re-admitted postpartum cases were eclampsia, haemorrhage, sepsis, severe anaemia and infected episiotomy.[24, 25]

Gujarat Scenario: Gujarat Maternal Mortality Ratio is 172/100,000 live births. Percentage of mothers receiving postnatal care within 2 days of delivery is 54.0% (urban-72.7% while rural 43.8%).[8] Hospital deliveries in SEWA-Rural's project area are 44%. In last five years Maternal Mortality Ratio has declined from 594 to 196 in the project area. Out of 3396 women, 17.2% had one or other types of maternal morbidities within 6 weeks of postpartum.[11] The study aims to measure prevalence, causes and health seeking behaviour of self reported postpartum morbidities.

1.3 Determinants of postpartum morbidities

Apart from the medical cause for maternal deaths are poverty, inadequate, inaccessible, or unaffordable health care, poor hygiene and care during childbirth, women's poor health before pregnancy, unequal access to resources, low status, restricted choices and inadequate information and knowledge for recognizing danger signs. As in the beginning it is mentioned that after one single death there are 20-30 women who survive may suffer morbidity or disability throughout their life spans. The determinants of the maternal mortality are the same one which makes women vulnerable for the postpartum morbidities.[26] There is, however, a strong need to identify and address the determinants of maternal morbidity.

1.4 Policy initiatives

To address women's health in general and for the safe motherhood in particular various policies and programmes were formulated on the basis of various international deliberations. Many governments are signatories of such conventions and treaties. An attempt has been made to examine various policies, programme initiatives and the present scenario of maternal health.

India launched its Child Survival and Safe Motherhood programme (CSSM) in 1992 to reduce Maternal Mortality Ratio (MMR) which was prior to global initiative on promotion of the same. The focus was given to institutional strengthening FRUs and service provision at the community level.[27] The Reproductive and Child Health (RCH) Programme-I, 1997 followed the above as a five-year programme to reduce MMR to 300/100,000 by 2002. Apart from other strategies an emphasis was laid on the midwifery care at PHCs levels. Though CSSM and RCH-I, did attempt to address MMR through the promotion of institutional deliveries and access to essential obstetric care. There were however, no significant declines in the MMR and IMR.[27]

The Reproductive and Child Health (RCH) Programme-II, 2004 set a goals to bring down the maternal mortality ratio up to 150/200,000 emphasize increasing the demand for quality health care and for greater community participation in the planning of public health interventions. The National Rural Health Mission (NRHM), 2005 a major new reforms initiative focuses on maternal health care and has subsumed the former RCH-II programme. Under the NRHM new strategies have been developed for reduction of maternal mortality which provide for a range of "concrete service guarantees'' for the rural poor. The free care to the rural poor before and during childbirth and postnatal was promoted through *Janani Suraksha Yojna*. A cadre of Accredited Social Health Activists (ASHAs) in every village as mobilizers, presence of skilled attendants at the time of child birth and conduction of institutional deliveries and availability of Comprehensive Emergency Obstetric Care (CEmOC) for 24hours X 7days to deal with different levels of complexity.[28,29] Improving EmOC is one of the many activities of the NRHM lacking clear strategy or focus.[30] Though average figures have come down in recent years, the actual figures continue to be exceptionally high particularly marginalised scheduled caste (*Dalit*), other lower caste and tribal communities.[7]

The WHO Commission's on social determinants of health report, 2008 recommendations to improve daily living conditions, tackle the inequitable distribution of power, money, and resources and measure and understand the problem and assess the impact of action.[31]

1.5 Rationale for the study

The role of postpartum care in reducing Maternal Mortality evidence indicates that the postpartum period is the most critical time for both maternal and neonatal survival. Yet, it remains the most neglected component in maternal and infant care. Postpartum morbidities and maternal morbidities are used overlapping. These morbidities are having many dimensions such as etiology, severity, duration of onset of illness, time,

accumulation and squeal with different cause, consequences and implication of treatment.[26]

Women who survive severe life-threatening complications, may suffer from a lifelong trauma, may face long-term physical, psychological, social and economic consequences. The chronic ill-health of a mother also has an effect on their families, children's lives who depend on their mothers for food, care and emotional support.[3] Haemorrhage and sepsis are the two important reasons for deaths and long term morbidities among women. These are preventable if identified in time.[4]

The evidence shows that around the late 1930s, with the introduction of antibiotics, safe blood transfusions for haemorrhage and improved surgical techniques for caesarean section etc., the women of the UK saw an improvement in survival and morbidity. Similarly women in other European countries, including Sweden, saw improvements a bit earlier around 1900 Century with the number of births attended by professional midwives increasing coupled with strong political will to tackle the problem. [32]

As far as the role of postpartum care in reducing maternal mortality is concerned, evidence indicates that the postpartum period is the most critical time for both maternal and neonatal survival. Yet, it remains the most neglected component in maternal and infant care. The terms postpartum morbidities and maternal morbidities are used in an overlapping manner. Relatively unknown is the prevalence of morbidity in the population as a whole due to difficulties in designing, implementation and analyses. These morbidities are having many dimensions such as etiology, severity, duration of onset of illness, time, accumulation of different causes with varying sequels and consequences, poverty, gender inequalities and the socio-political milieu determining them besides the implication of treatment.[26]

Any single morbidity often points towards a causal pathway with multiple possibilities for intervention. Example: Intake of poor diet in – childhood and adolescents may lead to improper physical development in terms of contracted pelvis which predisposes to obstructed labour, vesico-vaginal fistula leading to social ostracism, divorce and suicidal depression.[33] Women who survive severe life-threatening complications, may suffer from a lifelong trauma, may face long-term physical, psychological, social and economic consequences.

The chronic ill-health of a mother also has an effect on their families, children's lives who depend on their mothers for food, care and emotional support.[3] Haemorrhage and sepsis are the two important reasons for deaths and disability among women. These are preventable if identified in time.[4] Very little research has been reported on community based studies to measure the prevalence and determinants of self reported or otherwise postpartum morbidities from India. This study aims to measure prevalence of postpartum morbidity and its determinants**.** The findings may be useful for further designing and implementation of interventions subsequent to advocacy with various stakeholders. Investing in women's health makes social and economic sense.[32]

1.6 SEWA – Rural, Jhagadia, Bharuch

SEWA-Rural, a non-governmental organisation believes that each mother counts and their lives are worth saving. It has been working among the population of Jhagadia Block, Bharuch District; Gujarat state providing comprehensive community health care through a comprehensive network of community based workers, 100 bedded hospital and community development programmes. The organisation aims to demonstrate comprehensive service for safe motherhood and new born care, promoted through community based intervention models that can be up scaled. The organisation has a continuous record of data on maternal health and well being through its community based

intervention project on maternal health. This study was located in the study area of 168 majority tribal villages of Jhagadia block of Bharuch district where the SEWA-rural community based intervention is operationalised.

1.7 Objectives

The objective of this study is to estimate the prevalence of self reported postpartum morbidity and its determinants among the women aged 18-49 in a rural block of Gujarat state.

1.8 Chapterisation plan

The first chapter of this dissertation deals with extent of postpartum morbidity, policy initiatives to reduce it and the implications of these polices in brief. The second chapter contains the review of literature, identifying what is known regarding the topic under study and what are the knowledge gaps. The third chapter discusses the blue print of the methodology adopted for the studying the stated topic. In fourth chapter we have shared the results and analysis of the study. The last chapter discusses the results and policy recommendations.

CHAPTER 2
REVIEW OF LITERATURE

2. Introduction

In this chapter, existing literature has been reviewed in terms of relevant articles and recent studies pertaining to the topic of prevalence of postpartum morbidity. Subsequently the definitions, classification and magnitude/burden of postpartum morbidity have been elaborated upon describing prevalence, incidence and health seeking behaviour. The last part of the chapter explores the social determinants of postpartum morbidities.

2.1 Definitions of Postpartum/maternal morbidity

Maternal morbidity is defined as morbidities that occur during pregnancy or childbirth or within 42 days after giving birth. They can be acute, or chronic, lasting for months or even years. Many of these are conditions that may cause difficulty in pregnancy, and aggravate existing morbidities, which can lead to more severe consequences for women.[32]

We have found multiple existing definitions of postpartum morbidity and often each of them has been disputed, but the term roughly means women's illnesses and injuries related to pregnancy and childbirth. For the promotion of safe motherhood concept of maternal mortality has been emphasised as it is more straightforward to measure, they are only the tip of iceberg.[32]

A simple definition frequently used in the measurement of PPM from the dictionary of Epidemiology is "any departure, subjective or objective, from a state of physiological or psychological well-being during pregnancy, childbirth and the postpartum period up to 42 days or 1 year."[34]

The World Health Organization has defined PPM as "obstetric morbidity as morbidity among women who have been pregnant (regardless of the site or duration of the pregnancy) from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes".[36]

2.2 Classification of postpartum/maternal morbidity

"To define the maternal morbidity accurately is difficult due to misclassifications. Maternal morbidity has many interwoven causes that range from physiology and anatomy to status of woman and political priority. Perceptions of what constitutes morbidity vary. Research to date has focused on complications that are measurable and potentially 'life threatening'. The so-called minor complaints of pregnancy are rarely addressed even though these conditions may significantly impair women's well-being and their ability to work. Different persons classified maternal morbidities differently. Some preferred to classify based on its severity, others based on duration"[19]. A comprehensive analysis of the burden of obstetric mortality and morbidity needs to address both direct and indirect causes of death and disabilities.

Direct (conditions) obstetric morbidity

Temporary: Antepartum and postpartum haemorrhage, eclampsia, obstructed labour, rupture uterus, sepsis, ectopic pregnancy, molar pregnancy etc.[35,37]

Permanent (chronic) conditions: Vesico-vaginal and recto-vaginal fistulas, urinary or faecal incontinence, scarred uterus, pelvic inflammatory disease, palsy, dyspareunia, utrine prolapse, secondary infertility, obstetric palsy, Sheehan's syndrome.[37]

Indirect (conditions) Obstetric morbidity: These conditions are only expression of aggravated previous existing diseases like malaria, hepatitis, tuberculosis, anaemia, cardiovascular disease etc. by the changes in the various systems during pregnancy.[35, 37]

Psychology obstetric morbidity: Puerperal psychoses, postpartum depression (baby blues), suicide, and strong fear of pregnancy and child birth resulting from eg. Obstetric complications, interventions or cultural practices moderate to severe depression, anxiety disorders, postnatal psychosis.[37]

2.3 The global burden of postpartum morbidity

It is estimated that for every woman who dies due to pregnancy, childbirth or unsafe abortion, there are 20 who endure injury, infection disease and disabilities that cause lifelong suffering.[3] Over 300 million women in developing countries suffer from short or long term illnesses brought about by pregnancy or childbirth.[4]

2.3.1 Estimates of postpartum/maternal mortality

150,000 women die annually from PPH.[32] WHO estimates for 2000 that globally over 68,000 women die from complications of unsafe abortion each year.[38] Fifteen per cent of maternal deaths are the result of infections. In the world every year 63,000 maternal deaths are the result of pre-eclampsia, totalling 12 per cent of all maternal deaths.[32] Even in the UK where maternal deaths are infrequent, 17 percent of all maternal deaths are due to psychiatric causes.[39]

WHO, UNICEF and UNFPA estimates for the year 2000 indicate that of most of the 529, 000 maternal deaths globally; 67% occur in just 13 countries, India having highest estimated number (136,000) followed by Nigeria, Pakistan, Democratic Republic of Congo and Ethiopia, the United Republic of Tanzania, Afghanistan, Bangladesh, Angola, China and Kenya, Indonesia and Uganda (10,000).[37] Maternal death is like a tip of an ice-berg, hidden grim reality of maternal morbidities.[32]

2.3.2 Estimates of postpartum/maternal morbidity

Of the 120 million women who give birth every year, half experience a complication and 20 million develop disabilities. Two million women suffer from obstetric fistula, mostly in Africa and the Indian subcontinent.[32]

WHO estimates that more than 2 million women around the world suffer from fistula with between 50,000 and 100,000 new cases emerging each year.[32] causing heartbreaking morbidity. Two to 20 per cent of women of reproductive age suffer from prolapsed uterus.[40] Urinary stress incontinence is not only common with prolapsed uterus but

common following any childbirth, with or without complications. In many societies stress incontinence is perceived as an inevitable consequence of motherhood, including in the developed world, where it is estimated that half of pregnant women suffer from it and one in three women suffer from it post delivery.[32]

Other complications include obstetric fistula, perineal damage, prolapsed uterus, stress incontinence, puerperal infection and sepsis, haemorrhage, hypertensive disorder (pre-eclampsia) and fits, anaemia, infertility and ectopic pregnancy, depression and suicide can be easily prevented or treated.[32] WHO estimates that about 24 million women are currently infertile because of an unsafe abortion.[41]

There are 18-20 million abortions carried out illegally per year and almost 60 per cent of all unsafe abortions in Africa are among young women under the age of 25 and this would contribute to increasing the burden of PPM indirectly.

There is little evidence on the incidence of morbidity caused by pre-eclampsia.[32] World-wide, 42 per cent of pregnant women are anaemic (Ref 11). It disproportionately affects women living in the developing world. Malaria, malnutrition and worms are three of the factors that contribute to this high prevalence. Anaemia increases the risk of death from haemorrhage and causes over 13 per cent of maternal death in Asia and four per cent in Africa.[42] In sub-Saharan Africa, malaria is estimated to cause up to 400,000 cases of severe maternal anaemia and an estimated 10,000 deaths per year.[43] Serious maternal under-nutrition is common in sub-Saharan Africa, South Asia and South-East Asia and is critical in Bangladesh, Eritrea and India.[39]

Many women who develop depression are coping with many other complications in their lives such as poverty, a lack of social support, abusive partners, or bereavement. Women with a history of mental illness are more likely to suffer serious post-natal mental illness than other women. In addition, other maternal morbidities can, not surprisingly, have a

negative effect on mental health. The mental health of new mothers can adversely affect their ability to breastfeed and children of depressed mothers are more likely to suffer from stunting.[39] Currently, little understanding of the problem or support is available and research shows that as few as five per cent of women in the developing world with mental health disorders, arising from pregnancy, receive any support.[44]

There are very little data on mental health disorders in the developing world. However some research suggests the problem is as prevalent in the developing world as in the developed world. The prevalence of peri-natal depression is 20 to 30 per cent in developing countries and suicide is a leading cause of pregnancy-related death.[45]

It is estimated that annually about two million women with syphilis become pregnant in sub-Saharan Africa. Approximately 15 per cent of the babies born to women in a study in Bolivia had congenital syphilis (WHO written evidence). Syphilis can cause insanity and death in the adult and congenital syphilis in the newborn, with blindness, deafness and brain damage.[32]

2.3.3 Cause of maternal deaths and disabilities global

The major global burden of maternal deaths is due to obstructed labour-11%, eclampsia-16%, unsafe abortion-18%, infection- 21% and haemorrrhage-34%.[12] The risk of woman dying because of pregnancy or childbirth ranges from one in six in Afghanistan & Sierra Leone to one in 100 in India and one in 17,400 in Sweden[13]. Globally for every woman who dies approximately 30 women suffer injuries, infection and disability[12].

2.3.4 Global scenario of postpartum morbidity

Inequity of maternal health: One-third of the burden of disease experienced by women globally is the result of reproductive ill-health. Maternal health is one strong inequality that separates the developed and developing world.[40]

The studies conducted in developed countries like UK and Canada shows incidence of sever obstetric morbidity ranging from 12 to 4.38 per 1000 deliveries.[14,15]

In the developing world as a whole, a woman has a one in 76 lifetime risk of maternal death, compared with a probability of just one in 8,000 for women in the developed world. By way of comparison, the lifetime risk of maternal death ranges from just one in 47,600 for a mother in Ireland, to one in every seven in Niger, the country with the highest lifetime risk of maternal death.[46]

2.4 Economic burden due to postpartum morbidity

The medical benefits of Sexual and Reproductive Health (SRHR) interventions in*DALY's: SRHR problems account for 18 per cent of the total burden of disease and 32 per cent of the burden among women of reproductive ages (15-44). Women who suffer are less productive and maternal morbidity erodes precious human capital. Maternal conditions (haemorrhage or sepsis, obstructed labour, pre-eclampsia and eclampsia and unsafe abortion) account for two per cent of all DALYs* lost (13 per cent of all DALYs lost among reproductive-aged women).[32].The DALY methodology excludes all indirect obstetric complications, which have been estimated to cause 20% of all maternal deaths or more (WHO, 1998a).

Reproductive ill health accounted for 22% of the global disease burden (GBD) among women of reproductive age (15-44) and 3% for men (WHO, 1998a). Maternal conditions for 14.5% of GBD. Sub-Saharan Africa and India, accounted for 24.4% and 10.2% of GBD respectively.[47]

2.5 Burden in developing countries

Postpartum haemorrhage continues to be the dominant cause of maternal death in Africa and Asia, costing an estimated 140, 000 women their lives each year and leaving nearly 2 million more women struggling to recover from the debilitating effects of anaemia.[48] While infection accounts for a small proportion of maternal deaths in the industrial world,

it still causes 10-12% of maternal mortality in Africa and Asia. Hypertensive disorders of pregnancy, manifest mainly in pre-eclampsia and eclampsia (PEE), account for about 9% of maternal deaths in Africa and about one-quarter of maternal deaths in Africa and Asia and about one-quarter of maternal deaths in Latin America and the Caribbean.[49] Indirect causes are responsible for 19.3% of maternal deaths in India, 23.5% in Nepal and 45.0% in Sri Lanka.

Often, residual or long-term morbidity is neglected in most health systems. It is estimated that 15 million women annually develop long-term disabilities due to pregnancy related complications.[47] About 1 to 6 million women in Nepal suffers from utrine prolapse and recent studies have shown that its prevalence ranges from 10 to 40 per cent.[40]

Skilled birth attendants: In the SEAR countries births attended by skilled health personnel varies, 13% in Nepal to 98.6% in DPR Korea while it is 42.3% in India.[16] There are variations across the country in terms of proportion of births attended by skilled birth attendants, with a high of 24.7 in Nagaland to 99.4 in Kerala.[8]

2.6 Major cause of maternal mortality in India

Maternal mortality in India has been reported as those due to direct causes and those due to indirect causes for the period 1997.[17] (SRS, 2000)

Direct causes: The leading direct cause of maternal mortality was haemorrhage 27.6%, Puerperal complications (including sepsis) found to be 13.0%. Obstructed labour accounted for 10.7% of the maternal mortality in India followed by abortion 7.3% and toxaemia of pregnancy 6.6%.

Indirect causes: A major leading indirect cause of maternal mortality is anaemia 17.3%. The other conditions were pregnancy with tuberculosis, malaria and hepatitis B 9.6%. Other causes were 7.0%. [17]

A similar analysis for the period 2001-03 estimated that haemorrhage- accounted for 38.0% of the maternal mortality, sepsis – 11.0%, hypertensive disorders – 5.0%, obstructed labour – 5.0%, abortions 0 8.0% and other conditions accounted for 34.0% of the mortality.[17.]

2.7 Prevalence of postpartum morbidity in India

India's maternal mortality ratio of 301/100,000 live births translates into about 80,000 women dying annually during pregnancy, childbirth or shortly thereafter[3]. Every 5 minutes, one woman somewhere in India dies from complications of child birth. Close to two thirds (65.0%) of deliveries still occur at home. Of all pregnant women in India 15.0% develop life threatening complications. Even though 60% of all maternal deaths occur after delivery but only one in six women receive postnatal care.[4] Only 37.0% of mothers had a postnatal check up within 2 days of birth and most of the mothers receive no PNC [5]. Early postnatal care (PNC) can reduce maternal mortality and morbidity.

2.7.1 Prevalence of postpartum morbidity in Indian states

In India, various studies conducted in Maharashtra, Haryana, Andhra Pradesh show a prevalence of postpartum morbidity of 74%, 61% and 42.9% respectively.[18,19,20] The NFHS-II reports that the proportion of postpartum morbidities was 14.8% in 1998-99. The major reported morbidities were weakness, lower abdominal pain, perineal pain, abnormal vaginal discharge, high fever, excessive bleeding, discharge smells, breast problems and insomnia from 7.4%-43%.[18,19,20] Other studies from Chennai and Goa shows postpartum depression of 33.4% and 23% while psychosis is 6.5%.[24, 25] The major morbidities reported in studies conducted in tertiary care hospital in Wardha and Delhi on re-admitted postpartum cases were eclampsia, haemorrhage, sepsis, severe anaemia and infected episiotomy [24,25].

2.7.2 Prevalence of postpartum morbidity in Gujarat

Gujarat's Maternal Mortality Ratio is 172/100000 live births[5] Infant Mortality Rate is 52.[10] The state had a Total Fertility Rate of 2.42.[8] Percentage of mothers receiving postnatal care within 2 days of delivery is 54.0% (urban-72.7% while rural 43.8%).[8]

Hospital deliveries in SEWA-Rural's project area are 44%. In last five years maternal mortality ratio has declined from 594 to 196 in the project area. Out of 3396 women, 17.2% had one or other types of maternal morbidities within 6 weeks of postpartum.[11]

Bharuch is one of the oldest of the 26th districts of Gujarat State. SEWA-Rural is a leading NGO in Gujarat supplementing the health care services being provided by the governmental health centres in the Jhagadia taluka which is a predominantly tribal block of Bharuch district. In the field operational areas of SEWA Rural, 55 percent of total deliveries are home deliveries while institutional deliveries are 45 percentages out of which 70 percentage are conducted in SEWA-Rural hospital. [11]

2.8 Health seeking behaviour/treatment

Studies indicate that between 25 to 33 percent of women with postpartum morbidities were treated at home by an elderly family member, neighbour or traditional birth attendant. The private sector and paramedic at private hospitals were involved in treating between is 14%-33%. The government facility was used for 6.8 to 42 percent of the case in the studies carried out in villages in North India and West Bengal respectively (SC/PHC/DH) 42%-6.8%. [18, 50]

In India many births take place at home out of which significant proportions of deliveries are assisted by unskilled persons. This and other factors render women in India vulnerable to complications in the postpartum period because they lack effective care. More women in India access maternal health services during pregnancy than during delivery or after childbirth. Because of these in life threatening situations/complications women may not

receive life –saving emergency services which increases the chance of maternal deaths or morbidity.[26]

The four delays are:

First Delay: Delay in recognizing the problem (lack of awareness of danger signs).

Second Delay: Delay in deciding to seek care (inaccessible health facility, fear of costs, lack of resources to pay for services, supplies and medicines).

Third Delay: Delay in reaching the health facility (no transport available, unaware of appropriate referral facility).

Fourth Delay: Delay in receiving adequate treatment once a woman has arrived at the health facility (health facility not adequately equipped, lack of trained personnel.[26]

2.9 Social determinants of health and postpartum morbidity

Maternal health is inextricably linked to development, poverty reduction and social inclusion. Out of all the Millennium Development Goals, unfortunately, it is the MDG- 5 pertaining to improvement of maternal health has still left a lot be desired.[30]

Maternal mortality is the result of a set of factors that arise in the social, economic, educational, political and cultural sphere. The prevailing gender inequity in many societies, the state of physical infrastructure that is rather poor, the difficult geographic terrain and the weakness of the health system all contribute to enhancing the maternal mortality rates. Women's lack of power, poor access to information and care, restricted mobility, low political priority, heavy physical workloads and early marriage all contribute to the neglect that persist at all levels of society.

Similarly maternal morbidity is causally associated with gender inequality, gender based violence, poor access to education to girls, early marriage, adolescent pregnancy, poor access to comprehensive quality sexual and reproductive health services and other socio-economic, cultural and environmental determinants. Among the many structural problems

in maternal health, the lack of qualified health personnel, drugs and supplies, economic inequity, remote populations, the low status of women and a lack of political will and ideologically driven policies.[32,17]

Apart from the medical cause for maternal deaths, the underlying causes for maternal mortality are poverty, inadequate, inaccessible, or unaffordable health care, poor hygiene and care during childbirth, women's poor health before pregnancy, unequal access to resources, low status, restricted choices and inadequate information and knowledge for recognizing danger signs[26.]

The prospective study conducted in village of north India Patra et al.[18], reported that the postpartum morbidity was greater among lower socioeconomic status. The obstetric predictors like women having multipara (>4) had high prevalence of PPM. It was also found that women who had >36 months birth interval were found to be more vulnerable. Those women who had breach or caesarean delivery or delivery conducted by relatives or neighbour had greater postpartum morbidity. The same study reported significant association with age and non maintenance of five cleanse during delivery.[18]

The study reports that during the postpartum period the health seeking behaviour of women found to be low than antenatal period. Women having painful perineum, urinary incontinence and haemorrhoid not easy subjects for women to disclose.[19] The Bang study reported that those women who had adverse perinatal outcome had higher infection, fits, psychosis and breast problem.[20] The Wardha hospital based study observed that those women who delivered at health care found to have infected episiotomies. While in the case of home delivery it was vaginal and perineal infected tear. Thus the place of delivery, quality of services was determining factors for the postpartum morbidity (sepsis-51.0percent).[24]

A study conducted at Chennai found that husbands occupation, unskilled worker had 8.2 percent prevalence compared to skilled worker 2.2 percent to have psychiatric illness. The types of family found as important determinants. Those women who lived in nuclear families had 9.4 percent psychiatric illness than women who of jointly had 1.2 percent.[21]

The West Bengal study on utilisation of postnatal care services by tribal women reported that greater the religiosity lesser is utilisation f the institutional services. It was found that traditional healer was charging so high; to get health services they have to skip their meals. The author reported that the tribal population have distinct problems, not because they have special kind of health but because of special placement in difficult areas and the circumstances in which they live. Women who were married living with husband were utilising health services than their counterparts.[50]

The study conducted by Rama Padma reported that age, parity, women's work status, poor infrastructure facilities, access of health workers, lack of women doctor, lack of adequate staff, availability of health services etc. are key determinants adversely affecting maternal morbidity.

The Mapedir maternal and perinatal death inquiry- the UNICEF report has enlisted key determinants of perinatal deaths-consequences of anaemia, multi pregnancies, pregnancies among unmarried young girls. Social, economical and cultural, biological, medical factors, faulty diet habits, son preference, ignorance regarding reproduction and contraception.[6]

Long-term physical, psychological, social and economic problems leave many women being abandoned and/or ostracised. Maternal morbidity can be effectively reduced by addressing the above determinants and by ensuring universal access to family planning and safe abortion, skilled attendance at birth, and basic and comprehensive emergency obstetric care.[32]

CHAPTER 3
METHODOLOGY

3. Introduction

The methodologies used to collect the data and complete the analysis in order to estimate the prevalence of self reported postpartum morbidity and its determinants among women aged 18-49 in a rural block of Gujarat state are detailed here.

3.1 Study Design

The study used a cross sectional study design to conduct a community based survey of women who delivered during a specified period.

3.2 Study setting

There are 26 districts in Gujarat state. Bharuch district, where the site of the present study is located, is one of the districts of Gujarat which is surrounded by three districts Vadodara, Surat and Narmada respectively north, south and east and bay of Cambey in the west. Some portions of Jhagadia block are hilly; while the remaining portions are plain and flat.

As per census 2001 total population of district is 1370104. Out of which urban population is 352719 and rural population is 1017385. Population of schedule castes in this area is 61491 and that of scheduled tribes is 444043. The district has total eight blocks and 662 villages. The Sex ratio is 920 females per 1000 males. Over all literacy rate is 74.4% while male literacy is 83% and female literacy levels is 65.1%. There are 7 CHCs and 37 PHCs in 8 Blocks (*Taluka*) of the district. Jhagadia is one of the blocks of the Bharuch district and had been chosen for the study. The block has one CHC, 7 PHC and 44 sub centres.[51]

The study was undertaken under the collaborative project on “Safe motherhood” of AMCHSS, Trivendrum, CSER, Mumbai and SEWA-Rural, Jhagadia. The area is served

by the First Referral Unit (FRU) at Jhagadia which is run by SEWA-Rural. This consisted of a total of 168 villages having a population of 1,75,000 in Jhagadia block in Bharuch district of Gujarat, were included in the study

3.3 Sample frame

All women in the age group of 18 to 49 years (a total of 35,436) out of which those having delivered (with any outcome) at hospital or at home in the last three months viz, April, May and June, 2009; registered under the Safe motherhood project of SEWA-Rural, Jhagadia and residing in Jhagadia block, Bharuch were included in the sample frame.

3.4 Sample size

The sample size estimation was done using the following formula:

$$\frac{1.96^2 \text{ X PQ}}{D^2} . = \frac{3.8416\text{X}0.43\text{X}0.57}{0.0025}$$

Using the prevalence of postpartum morbidity as 43%[19] with C.I. 95% in the above mentioned formula, the sample size was calculated to be 376.6. Assuming a loss of 10% response (37) was added to calculate the final sample size which was rounded off to 415. There were 582 women who were identified and out of that 514 respondents who fulfilled the inclusion criteria and expressed their willingness to participate were included in the study.

3.5 Sample selection procedures

The participants were selected from a total of 168 villages with a total population of 175,000 situated in the tribal and rural areas of Jhagadia block.

The area is served under the second phase of Family Centered Safe Motherhood and Newborn Care Project of SEWA-Rural, which aims to reduce maternal and neonatal mortality and morbidity. The first phase of the project was from October 2003 to

September 2006 while phase-II is from October, 2007 to September, 2010 supported by the Mac Arthur Foundation, Delhi.

Under this project, a Village Health Worker (*Arogya Sakhi*) maintains maternal and child health (MCH) records of all the women amongst the eligible couples within the project area. The list of all women (582 in number) who have delivered during the period of 1st April to 30th June, 2009 was prepared and handed over to field investigators (*Setu Karyakar)* who subsequently contacted these women. From among this group, 514 women consented to participate and were recruited for the study. There were total 68 women who were not recruited for the study. The reasons for not being in study were; 36 women were out of village/migrated for labour at the time of survey. While 22 women were residing in villages but at the time of survey they were not at home and were not contactable as they were in field for labour. Nine women had not consented as some of them were not happy with the health service while few had adverse perineal outcome. There was one maternal death; and this being serious, information about this woman was not available.

The sample included only those women who are resident of the villages where the project is operational and are married in project villages. The women of project villages married to men residing in the non-project area were excluded as they came for delivery to their parental home and after the delivery (normally after 45days) they went back to their in laws' home; hence they were not considered for interview. In addition to this group, women who are usual residents of Jhagadia block within the project area and went to their maternal homes within the same block were included and interviewed.

3.6 Study instrument/tools

A pre-tested interview schedule has been developed and translated into Gujarati for use in the study. Recording of special events like postpartum maternal death; experiences of

women having survived serious postpartum morbidities/complications were recorded in a case study form. To measure the socio economic status, the validated Standard of Living Index (SLI) was used.

3.7 Data collection techniques

The structured interview schedule in Gujarati was used to collect data. SEWA-Rural, Jhagadia's existing twenty link workers *(Setu Karyakars)* (based at village level with most of them having educational level of 10^{th} standard) have been trained on issues pertaining to safe motherhood and have experience of similar surveys collected the data at the field level. Only those who consented to participate in the study were included in the study. The data collection process was monitored by the researcher with the assistance of the SEWA-Rural project supervisors.

3.8 Outcome variable

Prevalence of the postpartum morbidity.

3.8.1 Measurement of outcome variable

Self reported and validated postpartum morbidity through medical diagnosis of reported signs and symptoms.

3.8.2 Definition of postpartum/maternal morbidity

Definitions of maternal morbidity: any departure, subjective or objective, from a state of physiological or psychological well-being during pregnancy, childbirth and the postpartum period up to 42 days or 1 year.[34]

The World Health Organization (1992) has defined "obstetric morbidity as morbidity among women who have been pregnant (regardless of site or duration of the pregnancy) from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes."

Operational definition of postpartum period: first hour after delivery of a baby and placenta and up to the (42^{nd} day after delivery) three months after delivery.

Operational definition of postpartum morbidity: any problem/illness reported by the postpartum woman (up to 42 days after the child birth) during the postpartum period related to reproductive health and non reproductive health.

An adverse event: any serious morbidity which would have adverse effect on postpartum woman may in terms of physical or psychological causing suffering, disability or death.

3.9 Measurement and relevance of respondent's predictor variables

1. **Age:** Age was assessed by self reported age by the participant in completed years. The same was not confirmed by any other documents available at household.
2. **Caste:** This variable is a surrogate marker for socioeconomic class differential, becomes an important social determinant of maternal health.
3. **Marital Status:** Data were collected to analyze its influence on prevalence of postpartum self reported current marital status at the time of interview. It was categorized into Unmarried (never married) and married (ever married that includes married with spouse, separated, divorced and widowed) for further analysis.
4. **Nuclear family:** A nuclear family is a group consisting of a father and mother and their children as separate from non-nuclear families (like extended family/joint family/two generation family etc).
5. **Other adult women in household other than respondent:** This was taken to mean the presence of a woman of 15 plus age group who is in position to help respondent in case of health emergency within her household.
6. **Education:** Knowledge, attitude and perception were greatly determined by education which in turn influences health seeking behaviour. Since the women's education status is low in area, information was collected on self reported completed years of schooling. For the further analysis it was grouped appropriately.

7. **Occupation:** The respondents' main occupation during the past one year was taken to be the occupation. It was further grouped into wage remunerative and non-remunerative work categories.
8. **Standard of Living Index (SLI):** The standard of living index was calculated by using the standard of living (SLI) matrix of National Family Health Survey (NFHS-2) with slight modification for the rural population. Standard of living of respondents' houses was assessed by enquiring about ownership of land, house and other assets and availability of facilities like toilet, drinking water, and electricity. The SLI scores according to this matrix fell between 0 (lowest) to 67 (highest). They were then grouped into low (0-14), medium (15-24) and high (25- 67) SLI group.
9. **Gravida:** This represents the number of times the respondent had got pregnant and has a direct correlation with several postpartum outcomes.
10. **Availability of emergency transport:** Information has been elicited about the availability and access to emergency transport whether at household or community level. Delay in transport is one of the four critical reasons for the adverse maternal outcomes.
11. **Birth intervals:** More number of births within short intervals has adverse impact on women's health. Postpartum morbidity is directly linked to childbirth hence the information was obtained on the interval between this delivery and the previous one. It was further grouped as $\leq$ 24months $\geq$ = 25 months for the purpose of analysis.
12. **Nature of delivery:** This is associated with the maternal morbidity. The information was collected on types of delivery with or without episiotomy, forceps-vacuum or caesarean section. It was further categorized into invasive procedures and non-invasive procedures.

13. **Place of delivery:** The information of place such as home/on the way and in hospital was gathered. It was further classified as institutional delivery and non-institutional delivery to correlate its association with postpartum morbidity.
14. **Delivery conducted by whom:** It is promoted and desired that all the delivery should be conducted by the Skill birth attendant. Hence information was collected on the delivery was conducted by; the information was further analysed in terms of deliveries conducted by SBA and Non-SBA.
15. **Obstetric history:** Bad obstetric history (BOH) has a bearing on the outcome of delivery and maternal health. The information was analyzed to see the association between the respondents having BOH and PPM and with those who did not have. (anaemia, multi-parity, young/old age, HT, Diabetes, Previous caesarean, pre-eclampsia, Heart problem, T.B., Night blindness, Malaria).
16. **Outcome of pregnancy:** The status of child in terms of live birth, stillbirth and sex of child (in local area if women have a male child they wait for female child and if female they wait for male child) has direct effect on maternal emotional and mental health.
17. **Use of disposable delivery kit (DDK) in case non-institutional delivery:** DDK meant for conduction of a septic delivery at household level or where resources are scarce/mother is not able to reach institution for delivery.
18. **Number of Ante-natal care received** (100 T.I.F.A. appropriate doses of TT and 3 visits by trained health care professional FHW): Women having complete ANC tend to have better outcome/health and will have access to PNC.
19. **Health seeking behaviour and service utilisation during ANC, INC& postpartum:** Maternal morbidity is many times considered as part of birth process

and women won't seek any treatment. The information was asked on HSB, traditional practice, access to private, public health care services.

20. **Postpartum visit:** Postpartum visit made by FHW/community based health worker may rule out presence of any maternal illness and advice and referral can be done as per the need. The information was collected on the PP visit day by the personnel. It was further analyzed as per the postpartum visit done on 1-2 day or after that to determine the association with postpartum morbidity.

3.10 Measurement and relevance of Husband's predictor variables

1. **Education:** It is believed that the awareness level of husband influences decision making at the household level. Hence husband's educational status is used as a proxy indicator. Further it was categorized as illiterate and literate for the analysis.

2. Occupation: Reflects the income, availability of husband for postpartum period/care or in case of maternal emergency. For the analysis it was further grouped into remunerative and non-remunerative work pattern.

3.11 Inclusion criteria

All women above 18 years of age (as reported by them) who had a delivery after 28 weeks of gestational age (with any outcome) and are from the project villages and married in project villages within Jhagadia were included. Thus all women 18 years of age or more with pre-term, post term, live births and still births were included in the study.

3.11.1 Exclusion criteria

Because of the eligibility for benefits, there was a possibility that all women would have reported themselves as being above 18 years. Verifying this could have been a problem as the hospital providing services is also the one giving benefits to the women. Moreover, for those reporting themselves as below 18, need to find the legal guardian for obtaining

consent which is quite difficult as most of the family members go for labour/agriculture work. In order to avoid these problems women below 18 years were excluded. All the MTPs and abortions were also excluded.

3.12 Data storage and statistical analysis

All the information collected from the respondents was checked by the researcher before the data entry. After the data entry, data cleaning was carried out prior to proceeding for the analysis. Quantitative data were analyzed using SPSS version 17.0. For bivariate analysis p-value ≤ 0.05 considered as statistically significant.

To know the sample characteristics, an initial descriptive statistical analysis was carried out followed by application of chi-square test. The self reported postpartum morbidity and the postpartum morbidity validated/diagnosed by symptoms were grouped for further analysis.

To do statistical analysis, a comparison was done between the women with postpartum morbidity those without them. Within each group comparison was done for the demographic and health related characteristics. Chi square test was done to compare proportions in the two groups.

A similar bivariate analysis was undertaken between experience for morbidity in the antenatal period and intrapartum period and relevant predictors like socio-demographic characteristics, risk during ante partum, and intrapartum periods.

Amongst the women self reported postpartum morbidity the prevalence of anaemia was found to be a major cause for postpartum morbidity and found significant during pregnancy and intrapartum period. Descriptive analysis done with the stratification by caste was also undertaken to examine the differences by caste groupings. The pathways to postpartum morbidity was traced, starting from antenatal care and morbidity experienced

through the postpartum period. Specific adverse events (3 cases) that throw light on the nature of postpartum morbidity experiences were documented in depth.

3.13 Ethical considerations

In addition to the necessary permissions from the partner NGO (SEWA-Rural), Department of Health and Family Welfare, Government of Gujarat; approval of the Institutional Ethic Committee (IEC) was obtained from the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthpuram with a careful consideration of the following issues:-

3.13.1 ***Confidentiality:*** The identity of the respondent/participant is not to be entered for data analysis. The SPSS sheet containing the data will have only the interview number/identity. It was assured to the respondents that confidentiality will be maintained regarding the information given by all the respondents which would remain in the safe custody of principal investigator and would be used only for the research purposes at any stage. In a few cases where the respondents had severe morbidity and had not accessed health care, confidentiality could not maintained as the investigator (*Setu Karyakar)* referred them to SEWA-Rural hospital and ensured further referral to another district's teaching hospital, but with the consent of the respondents.

3.13.2 ***Privacy*****:** The interviews were conducted at the residence of the respondents. While interviewing, privacy was ensured.

3.13.3 ***Consent:*** Informed written consent was obtained in local language i.e. Gujarati. The participant was free not to give answer to a particular question or could have withdrawn from the study unconditionally. Verbal and written informed consent in local language was obtained in almost all cases. In case of illiterate respondent having agreed to participate, witnessed consent was taken.

3.13.4 ***Referral:*** Participants with severe morbidity of any nature were referred to SEWA-Rural Hospital/ other institutions or wherever the patient/relatives wanted to go.

3.13.5 Data storage, transfer and management: Hard and soft copy of the data will be preserved for the three years. The identities of respondents have been delinked using code for villages**.**

3.14 Project Management

3.14.1 Staffing and work plan: The existing link workers (*Setu Karykars)* of the collaborative NGO (SEWA-Rural) based in Jhagadia were recruited for the study. These link workers are local women having education about 10^{th} or plus. They were trained on issues pertaining to safe motherhood and recruited for the data collection. The data collection in field was monitored by the investigator.

For ensuring quality collection of data, each investigator filled up two to three forms per day. The process of data collection from 514 respondents took about 45 days. The researcher has randomly planned field visits for supportive supervision and monitoring. Additionally, monitoring of the quality of data collection by the field investigators, guidance and clarifications were carried out during their scheduled weekly headquarter meetings. The supervisory visits by the investigator were also used for cross verifications and scrutiny of the filled up interview schedules. The validations of postpartum morbidity were done periodically.

3.14.2 Administration: The Principal Investigator conducted the training of 20 field investigators (*Setu Karyakars*). The training was conducted over a period of 4 days and included field based training and feedback. The project staff of SEWA-Rural was involved during the field visit made for the training. Primary data collection through household survey was conducted by these trained investigators. All the 514 women fulfilling the inclusion criteria were interviewed after obtaining their consent. Each field

investigators (*Setu Karyakar)* conducted survey in 10 villages and covered respondents in a number ranging from 8 to 35. All the filled up forms were scrutinized by the principal investigator on a regular basis. At least 2% of the filled forms were randomly considered for cross verification by the principal investigator. An honorarium of Rs. 10 per interview was paid to all the field investigators by the principal investigator from her fellowship grant from AMCHSS, SCTIMST, Kerala. For the adverse events the principal investigator has interacted with various stakeholders and documented those cases.

CHAPTER 4
RESULTS

4. Introduction

This study proposed to estimate the prevalence of self-reported postpartum morbidity among women and examine the determinants of this morbidity. In this chapter, the result of statistical analysis of 514 cases (postpartum women) delivered during April to June, 2009 are discussed. Detailed analyses of complications during pregnancy, intra partum and postpartum period have been undertaken.

This chapter consists of four sections. The first section details the profile of the 514 participants of the study in terms of those who experienced postpartum morbidity and those who did not experience postpartum morbidity. The second section details a descriptive analysis of the health problems experienced in the antenatal, intrapartum and postpartum period and identifies the specific factors that are associated with morbidity in each period. The third section includes an analysis of the problems experienced in the antenatal, intrapartum and postpartum period stratified by caste. Lastly we describe the pathways to reproductive morbidity in terms of the timing of the experience and the treatment sought.

4.1 Profile of participants

This part of the chapter explains the characteristics of women who delivered in April – June 2009 by their experience of postpartum morbidity.

4.1.1 Demographic characteristics of the study participants

The mean age of the study participants was 23.72 $\pm$ 3.1years and the median age was 23 years. The age of the participants ranged from 18 to 40 years. Ninety eight percent of the women were currently married and about a two percent were divorced, separated, unmarried, were in a live-in relationship or had been widowed. The level of post partum morbidity was higher in the younger ages and it declined with age. However it should be

remembered that women below 19 were few in number (3.7%). The association between postpartum morbidity age was not statistically significant.

Table 4.1: Percentage distribution of women by demographic characteristics and experience of postpartum morbidity, Jhagadia, 2009 (n = 514)

Demographic characteristics	Postpartum morbidity			
Age (23.72 ± 3.1)	Yes (%)	No (%)	Total	(%)
18-19 years	11(57.9)	8 (42.1)	19(100.0)	(3.7)
20-24 years	150 (50.0)	150 (50.0)	300(100.0)	(58.4)
25-29 years	77 (47.2)	86(52.8)	163(100.0)	(31.7)
30 or more than 30 years	12 (37.5)	20(62.5)	32(100.0)	(6.2)
Total	250 (48.6)	264(51.4)	514(100.0)	(100.0)
Chi-square = with 3 d.f = 2.591; p = 0.459				
Gravida				
Primi	71(48.3)	76(51.7)	147(100)	(26.8)
Multi (2 to 4)	158(47.4)	175(52.6)	333(100)	(64.8)
Grand Multi (≥5)	21(61.8**)**	13(38.2)	34(100)	(6.6)
Total	250(48.6)	264(51.4)	514(100)	(100.0)
Chi-square = with 2 d.f = 2.541; p = 0.281				
Spacing between this delivery and previous one				
< 12 Month	22(56.4)	17(43.6)	39(100)	(10.6)
13 to 24 Month	68 (43.9)	87(56.1)	155(100)	(42.2)
25 to 60 Month	73(50.7)	71(49.3)	144(100)	(39.2)
Above 60 Month	16(55.2)	13(44.8)	29(100)	(7.9)
Total	179(48.8)	188(51.2)	367[#](100)	(100.0)
Chi-square = with 3 d.f = 3.089; p = 0.378 (# - 147 women were primi gravidas)				
Place of delivery				
Non institutional delivery	102(49.0)	106(51.0)	208(100)	(40.0)
Institutional delivery	148(48.4)	158(51.6)	306(100)	(59.6)
Total	250(48.6)	264(51.4)	514(100)	(100.0)
Chi-square = with 1 d.f = 0.022; p = 0.881				

Source: Primary survey, 2009 Jhagadia

The gravida, spacing between the last delivery and previous one and place of delivery were included as key demographic characteristics that could impact the experience of postpartum morbidity.

About a quarter of the women were primi gravidas and it was found that postpartum morbidity was lower amongst them when compared to grand multipara (5 or more

pregnancies). After excluding those who were primi gravidas, postpartum morbidity was higher among those with short and extended birth intervals.

The prevalence of postpartum morbidity did not vary by site of delivery (institutional vs. non-institutional).

4.1.2 Social economic characteristics of the study participants

The proportion of women who had experienced postpartum morbidity was least amongst the scheduled caste women (33.9%) and relatively higher among those who belonged to schedule tribe (51.1%) and other backward castes (50.0%). The difference in prevalence across caste groups was not statistically significant to indicate an association between postpartum morbidity and caste.

Postpartum morbidity was higher among those who lived in nuclear households than among those who lived in joint households (50.6% vs. 44.2%).

Prevalence of postpartum morbidity was relatively higher among those with less education (50.6% among the illiterate) when compared to those with slightly higher education. However, it was, 54.5% among those with higher secondary and above education. This could be related better reporting of morbidity by this group. The prevalence of postpartum morbidity by education status was not statistically significant.

Table 4.2 Percentage distribution of women by SES Status of the women and experience of postpartum morbidity, Jhagadia, 2009 (n = 514)

SES Characteristics	Postpartum morbidity			
Caste	Yes (%)	No (%)	Total	(%)
Schedule caste	19(33.9)	37(66.1)	56(100.0)	(10.9)
Schedule tribe	193(51.1)	185(48.9)	378(100.0)	(73.5)
Other backward caste	25(50.0)	25(50.0)	50(100.0)	(9.7)
General	13(43.3)	17(56.7)	30(100.0)	(5.8)
Total	250(48.6)	264(51.4)	514(100.0)	(100.0)
Chi-square = with 3 d.f = 6.112 ; p= 0.106				
Type of family				
Nuclear family	182(50.6)	178(49.4)	360(100.0)	(70.0)
Joint family	68(44.2)	86(55.8)	154(100.0)	(30.0)
Total	250(48.6)	264(51.4)	514(100.0)	(100.0)
Chi-square = with 1 d.f = 1.768 ; P value = 0.184				
Women's education				
Illiterate	86(51.19)	82(48.8)	168(100.0)	(32.7)
Primary (upto 4 Std)	37(50.0)	37(50.0)	74(100.0)	(14.4)
Middle (5-7 Std)	61(45.2)	74(54.8)	135(100.0)	(26.3)
Secondary (8-10 Std)	48(46.6)	55(53.4)	103(100.0)	(20.1)
Higher Secondary and above	18(54.5)	15(45.5)	33(100.0)	(6.4)
Total	250(54.5)	263[#](45.5)	513(100.0)	(100.0)
Chi-square = with 4 d.f = 1.587; p= 0.811(one woman was not able to respond to the question about her education)				
Women's occupation				
Not engaged in remunerative work outside the house	137(46.9)	155(53.1)	292(100.0)	(58.8)
Agriculture work own farm	30(56.6)	23(43.4)	53(100.0)	(10.3)
Landless agricultural wage labour	33(45.2)	40(54.8)	73(100.0)	(14.2)
Other labour	50(52.1)	46(47.9)	96(100.0)	(18.7)
Total	250(48.6)	264(51.4)	514(100.0)	(100.0)
Chi-square = with 3 d.f = 2.493; p = 0.477				

Source: Primary survey, 2009 Jhagadia

There was no clear relationship between women's occupation and experience of post partum morbidity. Almost 56.6 percent of women engaged in agricultural work in their own farm experienced postpartum morbidity and the lowest level of post partum morbidity was among those who did agricultural wage labour on others land. The difference in prevalence by occupation of the women was not statistically significant.

4.1.3 Social economic status of women's household

We found that postpartum morbidity was slightly higher among women who belonged to the highest SLI (51.6%) as opposed to those in the lowest category (47.2%).

Table 4.3 Percentage distributions of women's household by SES Status and women's experience of postpartum morbidity, Jhagadia, 2009

SES status of women's household	Postpartum morbidity			
Standard of living index	Yes (%)	No (%)	Total	(%)
Low	59(47.2)	66(52.8)	125(100)	(24.3)
Medium	110(47.4)	122(52.6)	332(100)	(45.1)
Upper	81(51.6)	76(48.4)	157(100)	(30.5)
Total	250(48.6)	264(51.4)	514(100)	(100.0)
Chi-square = with 2 d.f = 0 .791; p = 0.673				
Motorised vehicle owned by household				
Yes	73(53.7)	63(46.3)	136(100)	(26.5)
No	177(46.8)	201(53.2)	378(100)	(73.5)
Total	250(48.6)	264(51.4)	514(100)	(100.0)
Chi-square = with 2 d.f = 1.887; p = 0.389				
Husband's education				
Illiterate	34(42.0)	47(58.0)	81(100)	(15.8)
Primary (upto 4 Std)	37(50.7)	36(49.3)	73(100.0)	(14.3)
Middle (5-7 Std)	56(48.7)	59(51.3)	115(100.0)	(22.5)
Secondary (8-10 Std)	86(50.6)	84(49.4)	170(100.0)	(33.1.)
Higher Secondary and above	37(50.7)	37(49.3)	74(100.0)	(14.3)
Total	250[#] (48.6)	263 (51.4)	513(100.0)	(100.0)
Chi-square = with 4 d.f = 1.895; p=0.755(6 women could not report their husband's educational qualification, therefore their husband's educational levels have been prorated using the existing distribution of husbands of women with postpartum morbidity)				
Husband's occupation				
Not engaged in remunerative work outside the house	2(66.7)	1(33.3)	3(100.0)	(0.6)
Agriculture work in own farm	43(51.9)	39(48.1)	82(100.0)	(16.0)
Landless agricultural wage labour	25(48.0)	26(52.0)	51(100.0)	(9.9)
Other labour	148(46.3)	168(53.7)	316(100.0)	(61.6)
Service	32(51.7)	29(48.3)	61(100.0)	(11.8)
Total	244[#](48.1)	263(51.9)	513(100.0)	(100.0)
Chi-square = with 4 d.f = 1.571; p = 0.814(6 women could not report husband's occupation)				

Source: Primary survey, 2009 Jhagadia

In addition to the SLI of the household, information on the availability of a motorised vehicle at household level was obtained. Slightly more than a quarter of the households (26.5%) owned a vehicle and the prevalence of post partum morbidity was slightly higher in these households than in households that did not own a motorised vehicle. There was no statistical significant association found between the prevalence of postpartum morbidity and type of family, SLI ownership of motorised vehicle by the family.

Education and occupation of the women's husband were collected as indicators of household socio-economic status. No clear association between women's post partum morbidity experience and husband's education and occupation was found.

4.2 Morbidity experience during antenatal, intrapartum and postpartum period

The prevalence of various types of morbidity the subjects experienced during the antenatal, intrapartum periods and postpartum periods are provided in subsequent tables (tables 4.4-4.6).

Table 4.4 Percentage distribution of women by types of antenatal health problems experienced, Jhagadia, 2009 (n=268)

Morbidity conditions	No. of women (%)
Nutrition deficiency	184(35.8)
False labour pain	41(8.0)
Pre-eclampsia	35(6.8)
Headache	32(6.2)
Infectious disease	23(4.5)
Burning micturation	22(4.3)
Antepartum haemorrhage	5(1.0)
Other complications	62(12.1)

Source: Primary survey, 2009 Jhagadia

Of the 514, the 268 (52.1%) women had experienced complications in the antenatal period. More than a third of the women (35.8%) had nutrition deficiency related problems (complaints such as anaemia, weakness, night blindness, breathing problem were grouped together). A small number of the women - 41 (8.0%) had false labour pain, 35 (6.8%) had pre-eclampsia (oedema and convulsion), 32 (6.2%) had headache, 23 (4.5%) had

infectious disease (jaundice, malaria, no case had TB), 22 (4.3%) had burning micturation, 5 (1.0%) had APH and 62 (12.1%) had other complications.

Table 4.5 Percentage distribution of women by types of intra partum morbidity experienced, Jhagadia, 2009 (n=210)

Morbidity conditions	No. of women (%)
Prolong labour	70(13.6)
Gabhraman[@]	64(12.5)
Weakness	62(12.1)
Leaking pv/premature rupture of membranes (PROM)	40(7.8)
Perinatal tear	26(5.1)
Preterm delivery	23(4.5)
Heavy bleeding during delivery	14(2.7)
Caesarean section	9(1.8)
Bleeding before delivery	7(1.4)
Cord around neck[1]	6(1.2)
Absence foetal movement[1]	3(0.6)
Still birth[1]	3(0.6)
Transverse-lie[1]	2(0.4)
Twins[1]	2(0.4)
Retained placenta	2(0.4)
Mal-presentation[1]	1(0.2)
Other complication	29(5.6)
Various malpresentations of foetus (including cord around the neck, absence of foetal movements, stillbirths, transverse lie, twins and malpresentation)	13(2.5)

Source: Primary survey, 2009 Jhagadia
@ - a state of feeling anxious with severe palpitations

About forty percent of the women experienced some form of complication in the intrapartum period (210 women). Prolonged labour was the most frequently occurring complication affecting 13.6% of the women. The next most frequently occurring condition was Gabhraman (a folk condition described as a heightened feeling of anxiousness accompanied by severe palpitations) - 12.5% had experienced it and 12.1% had weakness, 7.8% had leaking pv, 5.1% had perineal tear and 2.7% had a preterm delivery. The remaining intrapartum problems which constituted a very small percentage were mostly due to the type of delivery and malpresentations of the foetus.

Table 4.6 Percentage distribution of women by types of postpartum morbidity experienced, Jhagadia, 2009 (n-250)

Morbidity conditions	No. of women[$] (%)
Anaemia	152(29.6)
Fever	46(8.9)
Breast problem	39(7.6)
Infection	29(5.6)
Postpartum haemorrhage	19(3.7)
Urinary tract infection	17(3.3)
Other postpartum morbidities	84(16.3)

Source: Primary survey, 2009 Jhagadia
=$- multiple morbidities did exist

Of the 514 women who had given birth, 250 had experienced some postpartum morbidity or the other; bring the prevalence of self reported postpartum morbidity to 48.6%. Anaemia was the most frequently reported postpartum morbidity with 152 (29.6%) women reporting it (the individual frequency of anaemia, severe anaemia and sickle cell disease were grouped together). Fever was less frequently reported 46 (8.9%), while 39 (7.6%) had breast problems (breast engorgement, cracked nipple, retracted nipple, breast abscess were clubbed together). Nearly 29 (5.6%) had infection (obstetrics wound infection, puerperal sepsis), while 19 (3.7%) had postpartum haemorrhage (PPH), 17 (3.3%) had urinary tract infection and 84 (16.3%) had other postpartum morbidities (backache, lower abdominal pain and headache contributed significantly to this group).

4.2.1 Factors associated with pregnancy related morbidity

Since anaemia was the most frequently reported postpartum condition, there was reason to believe that women's lack of nutritional inputs predates the postpartum problems. To examine whether or not the experience of health problems in the antenatal and intrapartum period were precursors to the reports of postpartum morbidity, the associations between occurrence of morbidities in these periods and the postpartum period were examined.

Problems in the antenatal and intra partum period as potential predictors for postpartum morbidity:

Table 4.7: Percentage distribution of women having complications during

Complications	Antenatal period (%)	Intrapartum period (%)	Postpartum (%)
Yes	268(52.1)	210(40.9)	250(48.6)
No	246(47.9)	304(59.1)	264(51.4)
Total	514(100.0)	514(100.0)	514(100.0)

Source: Primary survey, 2009 Jhagadia

Of the 514 study subjects, 268 (52.1%)reported problems in the antenatal period, while about 41 percent experienced complications during intra partum period and far more than that – 250 of them (48.6%) reported morbidity conditions in the postpartum period.

Table 4.8: Percentage distribution of women who reported morbidities in the antenatal period by experiences of morbidity in the in the intrapartum, 2009

Complications	Complication in intrapartum period (%)	No complication in intrapartum period (%)	Total (%)
Complication in antenatal period	143(53.4)	125(46.6)	268(100.0)
No Complication in antenatal period	67(27.2)	179(72.8)	246(100.0)
Total	210(40.9)	304(59.1)	514(100.0)
Chi square =	OR=3.1[2.1-4.4], X^2 with 1d.f = 36.222; p= 0.000		

Source**:** Primary survey, 2009 Jhagadia

Women who reported problems in the intrapartum period were most likely to be women who also experienced problems in the antenatal period. This association was found to be statistically significant. It remains to be seen if problems in the antenatal period and in the intrapartum period were precursors of the possibility of reported morbidity in the post partum period. This association was also examined.

Table 4.9: Percentage distribution of women who reported antenatal and intrapartum morbidities by the experience of postpartum morbidity, Jhagadia

Complications	Reported Postpartum morbidity (%)	Did not report postpartum morbidity (%)	Total (%)
morbidity in antenatal period	94(35.1)	174(64.9)	268(100.0)
no morbidity in antenatal period	156(63.4)	90(36.6)	246(100.0)
Total	250(48.6)	264(51.4)	514(100.0)
Chi square =	OR=0.3[0.2-0.4], X^2 with 1d.f = 41.237; p= 0.000		
Morbidity in the in intra partum period	66(31.4)	144(68.6)	210(100.0)
No morbidity in the intrapartum period	184(60.5)	120(39.5)	304(100.0)
Total	250(48.6)	264(51.4)	514(100.0)
Chi square = OR=0.3[0.2-0.4], X^2 with 1d.f=42.095; p= 0.000			

Source: Primary survey, 2009 Jhagadia

Women who did not have problems in the antenatal and intrapartum period were more likely than those who did have problems – to experience post partum morbidity. This association was found to be statistically significant.

4.2.2 Factors associated with morbidity during antenatal, intrapartum and postpartum period

Anaemia was the most commonly occurring postpartum morbidity. We therefore examined the incidence of postpartum morbidity in terms of those related to anaemia and those not related to anaemia. These conditions in the post partum period and morbidity in the antenatal and intrapartum period were examined in terms of the relationship with other demographic and socio-economic predictors at the individual and household level.

Table 4.10: Demographic predictors of morbidity in the antenatal, intrapartum and postpartum period, Jhagadia, 2009

Independent Variables	Antenatal period problems	Intrapartum period problems	Postpartum problem Anaemia	Postpartum problems excluding anaemia
Age	X^2 with 3d.f=0.066 (p=0.996)	X^2 with 3d.f=4.818 (P=0.186)	X^2 with 3d.f=2.093 (p=0.553)	X^2 with 4d.f=0.933 (p=0.920)
Woman's education	X^2 with 4d.f=0.322 (p=0.988)	X^2 with 4d.f=7.594 (p=0.108)	X^2 with 4d.f=3.519 (p=0.475)	X^2 with 4d.f=1.393 (p=0.845)
Woman's occupation	X^2 with 3d.f=3.126 (p=0.373)	X^2 with 3d.f=5.188 (p=0.159)	X^2 with 3d.f=0.897 (p=0.826)	X^2 with 3d.f=1.180 (p=0.758)
Husband's education	X^2 with 4d.f=2.178 (p=0.703)	X^2 with 4d.f=2.517 (p=0.642)	X^2 with 4d.f=0.563 (p=0.967)	X^2 with 4d.f=3.485 (p=0.480)
Husband's occupation	X^2 with 4 d.f=8.958 **(p=0.062)**	X^2 with 4d.f=2.080 (p=0.721)	X^2 with 4d.f=6.354 (p=0.174)	X^2 with 4d.f=2.097 (p=0.721)
Gravida	X^2 with 2d.f=2.136 (p=0.344)	X^2 with 2d.f=10.452 **(p=0.005)**	X^2 with 2d.f=0.573 (p=0.751)	X^2 with 2d.f=2.188 (p=0.335)
Spacing period	X^2 with 3d.f=0.840 (p=0.840)	X^2 with 3d.f=10.484 **(p=0.015)**	X^2 with 3d.f=1.477 (p=0.688)	X^2 with 2d.f=7.101 (p=0.069)
Tablet Iron Folic Acid (TIFA)	X^2 with 2d.f=0.176 (p=0.916)	X^2 with 2d.f=0.294 (p=0.863)	X^2 with 2d.f=3.924 (p=0.141)	X^2 with 2d.f=10.854 **(p=0.004)**
Injection Tetanus Taxied (TT)	Odds= 1.541 [0.483-4.919] X^2 with 1d.f=0.540 (p=0.462)	Odds=0.966 [0.303-3.087] X^2 with 1d.f=0.003 (p=0.088)	Odds=0.580 [0.181-1.856] X^2 with 1d.f=0.863 (p=0.353)	Odds=1.106 [0.151-8.076] X^2 with 1d.f=0.010 (p=0.921)

Source: Primary survey, 2009 Jhagadia

Table 4.10 summarises the results of bivariate analysis of morbidity experiences of women in the different periods with demographic characteristics. Husband's occupation was found to be another predictor for the experience of antenatal morbidity.

Gravida is a strong predictor of problems in the intrapartum period and consumption of IFA tablets is a strong predictor of problems other than anaemia in the postpartum period

– perhaps because anaemia is resolved, the other problems dominate? This needs further examination.

Table 4.11: Individual and household level socio-economic predictors of morbidity in the antenatal, intrapartum and postpartum period, Jhagadia, 2009
Socio-economic variables and pregnancy related morbidity

Independent Variables	Antenatal problems	Intrapartum period problems	Postpartum problem Anaemia	Postpartum problems excluding anaemia
Caste	X^2 with 2d.f=9.900 **(p=0.007)**	X^2 with 2d.f=19.510 **(p=0.000)**	X^2 with 2d.f=12.793 **(p=0.002)**	X^2 with 2d.f=4.880 (p=0.087)
Type of family	Odds=0.885 [0.609-1.291] X^2 with 1d.f=0.404 (p=0.525)	Odds=1.003 [0.683-1.473] X^2 with 1d.f=0.000 (p=0.987)	Odds=1.021 [0.675-1.542] X^2 with 1d.f=0.009 (p=0.923)	Odds=1.053 [0.519-2.136] X^2 with 1d.f=0.021 (p=0.886)
Other women in household	Odds=0.878 [0.572-1.348] X^2 with 1d.f=0.355 (p=0.551)	Odds=0.689 [0.448-1.058] X^2 with 1d.f=2.911 (p=0.088)	Odds=0.772 [0.490-1.219] X^2 with 1d.f=1.236 (p=0.266)	Odds=1.137 [0.526-2.457] X^2 with 1d.f=0.107 (p=0.743)
Standard of living index	X^2 with 2d.f=2.127 (p=0.345)	X^2 with 2d.f=0.376 (p=0.829)	X^2 with 2d.f=1.856 (p=0.395)	X^2 with 2d.f=0.956 (p=0.620)
Vehicle owned by household	OR=1.373 [0.927-2.034] X^2 with 1d.f=2.507 (p=0.113)	OR=1.436 [0.955-2.159] X^2 with 1d.f=3.035 (p=0.081)	OR=1.262 [0.877-1.964] X^2 with 1d.f=1.064 (p=0.302)	OR=1.154 [0.767-1.735] X^2 with 1d.f=0.472 (p=0.492)

Source: Primary survey, 2009 Jhagadia

The results of table 4.11 show that there was no statistically significant association between socio-economic factors and morbidity in the different periods of pregnancy. However, caste has been a strong predictor for almost all forms of pregnancy related morbidity in all the periods – antenatal, intrapartum and postpartum (for anaemia related conditions) and this perhaps subsumes many other socio-economic factors.

Table 4.12: Type of delivery related Predictors of morbidity in the antenatal, intrapartum and postpartum period, Jhagadia, 2009

Pregnancy related morbidity

Independent Variables	Morbidity in the antenatal period	Morbidity in the intrapartum period	Postpartum problems - Anaemia	Postpartum problems - excluding anaemia
Place of delivery	Odds=0.891 [0.626-1.291] X^2 with 1d.f=0.408 (p =0.523)	Odds=1.846 [1.279-2.666] X^2 with 1d.f=10.805 **(p =0.001)**	Odds=0.841 [0.573-1.235] X^2 with 1d.f=0.782 (p=0.377)	X^2 with 4d.f=2.799 (p=0.592)
Type of attendant SBA/NSBA	Odds=0.377 [0.039-3.691] X^2 with 1d.f=0.756 (p =0.385)	X^2 with 1d.f=3.293 (p =0.070)	Odds=0.135 [0.014-1.328] X^2 with 1d.f=3.988 **(p =0.046)**	Odds=1.141 [0.554-2.348] X^2 with 1d.f=0.128 (p=0.721)
Mode of delivery	****	****	X^2 with 3d.f=2.457 (p=0.483)	X^2 with 2d.f=0.680 (p=0.712)
Use of DDK	****	****	X^2 with 2d.f=3.391 (p=0.184)	Odds=2.400 [0.686-8.397] X^2 with 1d.f=1.922 (p=0.166)
External massage	****	X^2 with 2d.f=4.542 (p=0.103)	X^2 with 2d.f=4.536 (p=0.104)	Odds=0.773 [0.237-2.521] X^2 with 1d.f=0.183 (p=0.669)

Source: Primary survey, 2009 Jhagadia *= Not applicable.

Use of institutions for delivery was a strong predictor for intrapartum problems as was the type of attendance at delivery for anaemia related postpartum problems.

4.3Treatment seeking variables and pregnancy related morbidity

In the following table further analysed was carried out to know the relationship with the predictor variable of women who sought treatment and those who did not get treatment during antenatal and intranatal period with the women who reported complications during intrapartum and postpartum period had complaint of anaemia or postpartum complaints other than anaemia.

Table 4.13: Type of delivery related Predictors of morbidity in the intrapartum and postpartum period, Jhagadia, 2009

Independent Variables	Antepartum period problems[1]	Intrapartum period problems[2]	Postpartum problem Anaemia[3]	Postpartum problems excluding[4] anaemia
Treatment sought for antenatal period problems: (Yes/ No)	****	Odds=0.419 [0.206-0.853] X^2 with 1d.f=5.970 **(p = 0.015)**	Odds=0.650 [0.320-1.324] X^2 with 1d.f=1.422 (p = 0.233)	Odds=1.222 [0.399-3.746] X^2 with 1d.f=0.124 (p = 0.725)
Treatment sought for intrapartum problems: (No/Yes)	****	****	Odds=2.362 [1.580-3.529] X^2 with 1d.f=18.032 **(p = 0.000)**	Odds=0.982 [0.461-2.093] X^2 with 1d.f=0.002 (p = 0.963)

Source: Primary survey, 2009 Jhagadia
[1]=268, [2]=210, [3]=152, [4]=194
****=Not applicable

Treatment sought for antenatal problems was a strong predictor for intrapartum problems and postpartum problems – anaemia as was the treatment sought for problems in the intrapartum for the occurrence of anaemia related problems in the postpartum period.

4.4 Caste stratified analysis of morbidity in the antenatal period, intrapartum period and postpartum period

Caste was almost the only factor that determined morbidity across all the three periods – antenatal, intrapartum and postpartum. In order to determine the actual pathways by which caste operates on morbidity, the analysis using demographic, socio-economic status and delivery conditions related variables was repeated using caste as a stratifier.

4.4.1 Stratified analysis for antenatal morbidity

In the bivariate analysis, the results of the predictor variables caste and husband's occupation and was found statistically significant with the complains in antenatal period. We have done stratified analysis by the caste to know relationship with the occurrence of morbidity during antenatal period.

The variable - husband's occupation was used and it was sub-grouped into two categories such as agriculture related work and non agriculture related work.

Table 4.14: Caste stratified analysis of morbidity in the antenatal period

Household level predictor	Caste	OR	CI	P
Husband's Occupation: Agriculture work, Non-Agricultural work	SC	0.830	0.191 - 3.609	0.804
	ST	1.831	1.124 - 2.984	**0.014**
	OBC	2.325	0.933 - 5.793	0.068

Source: Primary survey, 2009 Jhagadia.

Among the backward castes and STs, the women's husband's occupation was strong predictor of morbidity in the antenatal period the backward caste women and scheduled tribe women whose husband's occupation was agriculture related work had 2.3 times and 1.8 times greater chance of developing complication in antenatal period compared to those whose women's husband's engaged in non-agriculture related work respectively.

4.4.2 Stratified analysis for intrapartum morbidity

The bivariate analysis was also done for the predictor variables and morbidity in the intrapartum period. The result was found statistically significant with the predictor variables such as vehicle at household level, gravida, spacing, place of delivery, treatment sought in institution for antenatal period and type of delivery.

These predictors were used for further stratified analysis by caste for morbidity in the intrapartum period. The predictors were re-grouped. The gravida was regrouped to form two groups, primi gravidas and others. The spacing variable was re-grouped as less than 24 months and more than 24 months. The variable, type of delivery was grouped as invasive (caesarean, forceps and vacuum) and non-invasive procedures (includes normal vaginal delivery with or without episiotomy).

Table 4.15: Caste stratified analysis of morbidity in the intrapartum period

Morbidity	Caste	OR	CI	P
Vehicle Household: (Yes/ No) can you check how this was coded?	SC	1.875	0.536 - 6.560	0.322
	ST	1.091	0.663 -1.795	0.731
	OBC	3.869	1.449 - 10.331	**0.006**
Gravida: (Primi/ others)	SC	1.696	0.501 - 5.740	0.394
	ST	2.058	1.290 - 3.283	**0.002**
	OBC	0.882	0.346 - 2.252	0.793
Spacing: (<24 months/>= 24 months)	SC	0.935	0.239 - 3.655	0.923
	ST	0.913	0.552 - 1.509	0.722
	OBC	3.023	0.964 - 9.478	**0.054**
Delivery place: (Non-institutional delivery/ institutional delivery)	SC	0.976	0.309 - 3.080	0.967
	ST	2.177	1.405 - 3.375	**0.000**
	OBC	1.326	0.482 - 3.648	0.585
Treatment in ANC: (Yes/ No)	SC	0.104	0.015 - 0.733	**0.012**
	ST	0.609	0.272 - 1.363	0.225
	OBC	0.857	0.720 - 1.021	0.066
Treatment in INC: (No/ Yes)	SC	4.222	2.386 - 7.472	**0.000**
	ST	3.233	2.522 - 4.144	**0.000**
	OBC	5.500	2.667 - 11.342	**0.000**
Delivery type: (Invasive/ non-invasive procedures)	SC	1.550	1.194 - 2.012	0.210
	ST	2.368	2.018 - 2.778	**0.001**
	OBC	1.867	1.081 - 3.222	**0.059**

Source: Primary survey, 2009 Jhagadia.

Among the other backward caste women those who had vehicle at household level had 3.8 times greater chance of developing complication in intrapartum period compared to those women who did not have vehicle at the household level. Those women who had vehicle at their household had reported high morbidity. It may be because 88 percent of them had better access and had gone for the institutional delivery hence they were more likely to remember the event.

From the women of scheduled tribe caste those who were primi gravidas had 2.0 times greater chance of developing complication in intrapartum period compared to other women who had more than one pregnancy. Of the other backward caste women; those who had spacing less than 24 months between this delivery and the previous one had 3.0 times greater chance of developing complication in intrapartum period compared to those women who had spacing more than 24 months.

Among the scheduled tribe caste women those who had non-institutional delivery had 2.1 times greater chance of developing complication in intrapartum period compared to those women who had institutional delivery.

The women of other backward caste who had not taken treatment in intrapartum had 5.5 times greater chance of having intrapartum complications compared to those who had taken treatment during the intrapartum period. From the schedule caste women those who have not taken treatment during intrapartum period had 4.2 times greater chance to have complication in the intrapartum period compared to those who had taken treatment during the intrapartum period. The scheduled tribe caste women had not taken treatment in intrapartum period had 3.2 times greater chance of developing complications in intrapartum period compared to those women who had taken treatment during the intrapartum period. The scheduled tribe caste women had delivered by invasive procedures had 2.3 times greater chance of developing complications in intrapartum period compared to those women who had delivered through non-invasive procedures.

4.4.3 Stratified analysis of postpartum morbidity-anaemia

From the bivariate analysis the predictor variables types of attendance at delivery (SBA/NSBA) and treatment sought during postpartum period for anaemia was found to be statistically significant. Hence, it was further analysed with caste as a stratifier.

Table 4.16: Caste stratified analysis of postpartum morbidity – anaemia

Morbidity	Caste	OR	CI	P
Delivery attendant: SBA/NSBA	SC	0.720	0.233 - 2.222	0.567
	ST	0.877	0.552 - 1.393	0.578
	OBC	2.410	0.814 - 7.134	0.107
Treatment in INC: (No/ Yes)	SC	3.800	1.255 - 11.502	**0.016**
	ST	2.284	1.396 - 3.738	**0.001**
	OBC	1.077	0.372 - 3.121	0.891

Source: Primary survey, 2009 Jhagadia.

Among the other backward caste women, even those who had delivery by skilled birth attendant had 2.4 times greater risk of having anaemia problem during postpartum period

compared to those women who had non-skilled birth attendant. However, there were small numbers of women in this group and therefore this result cannot be taken as conclusive.

Among the schedule caste women those who do not take treatment in intra natal period have a 3.8 times greater chance of developing anaemia complication in postpartum period compared to those women who had taken treatment and for scheduled tribe women it was 2.28 times higher chance of anaemia amongst those who did not have any problem in the intrapartum period.

4.4.4 Stratified analysis of postpartum morbidity other than anaemia

In the biavariate analysis of all independent variables with the morbidity other than anaemia; only predictor variables like consumption of tablet iron folic acid and spacing found to be statistically significant with complaints other than anaemia in postpartum morbidity. Hence, these two variables were used for further stratified analysis by caste.

Table 4.17: Caste stratified analysis of post partum morbidity (conditions other than anaemia)

Morbidity	Caste	OR	CI	P
TIFA consumed: (No/ Yes)	SC	0.968	0.908 - 1.032	0.365
	ST	0.998	0.966 - 1.031	0.919
	OBC	0.932	0.835 - 1.040	0.224
Spacing: (≤24 months/ ≥ 24 months)	SC	0.318	0.081 - 1.244	0.095
	ST	1.061	0.646 - 1.745	0.815
	OBC	1.842	0.609 - 5.572	0.278
Treatment in INC: (No/ Yes)	SC	1.358	0.471 - 3.911	0.571
	ST	2.812	1.746 - 4.530	**0.000**
	OBC	1.405	0.554 - 3.560	0.473

Source: Primary survey, 2009 Jhagadia.

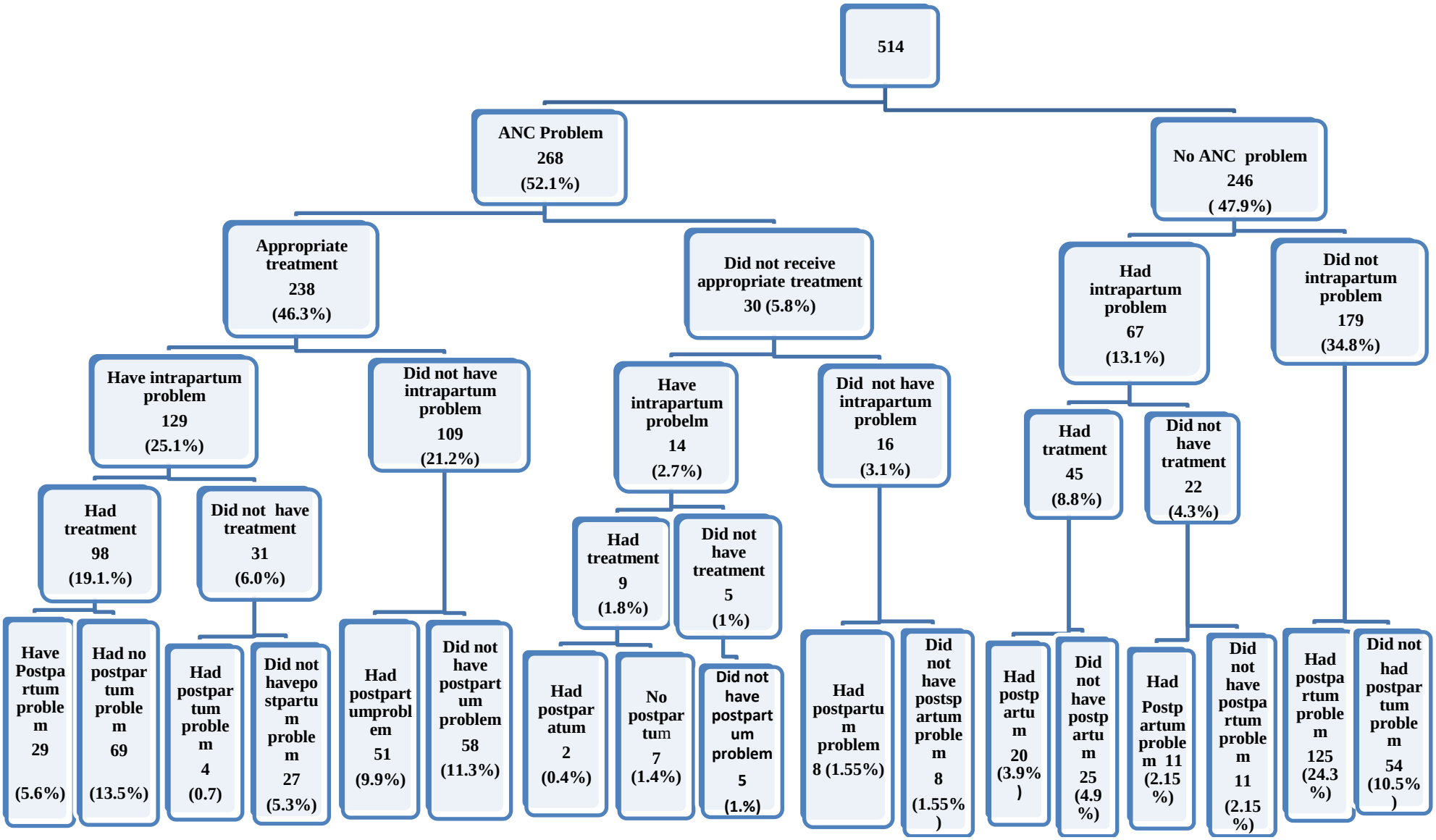
= the number is not computed because it is too small.

The table 4.17 gives the odds ratios of having morbidity conditions other than anaemia in the postpartum period. The scheduled tribe women who had not taken treatment in intrapartum period had 2.8 times greater chance to have other morbidity then anaemia in the postpartum period. The variable external massage odds ratio was not computed due to small number of cases included.

4.5 Pathways to postpartum morbidity

Postpartum morbidity seems to be a random phenomenon that may have some socio-economic determinants. It does not seem to be easily predictable in the study area using the selected independent factors. In terms of possible interventions, it therefore becomes relevant to examine the process indicators in addition to the input indicators already examined. Therefore, a woman's morbidity trajectory was traced from the point she became pregnant to the final outcome of presence or absence of postpartum morbidity this trajectory is depicted in Figure 1.

Figure 1.Pathways on the women's trajectory to postpartum morbidity from pregnancy to postpartum period, Jhagadia, 2009



Source: Primary survey, 2009 Jhagadia

Table 4.18: Status of women's experience of reproductive morbidity:

Had postpartum problem (%)		Did not have postpartum problem (%)	
1. Had ANC problem, underwent treatment, had a IP problem, underwent treatment and then had a PP Problem	29(5.6)	Had ANC problem, underwent treatment, had a IP problem, underwent treatment and then did not have a PP Problem	69(13.5)
2. Had ANC problem, underwent treatment, had a IP problem , did not have treatment and then had a PP Problem	4(0.7)	Had ANC problem, underwent treatment, had a IP problem, did not have treatment and then did not have a PP Problem	27(5.3)
3. Had ANC problem, underwent treatment, did not have a IP problem , and then had a PP Problem	51(9.9)	Had ANC problem, underwent treatment, did not have a IP problem , and then did not have a PP Problem	58(11.3)
4. Had ANC problem, did not have treatment, had a IP problem, underwent treatment and then had a PP Problem	2(0.4)	Had ANC problem, did not have treatment, had a IP problem, underwent treatment and then did not have a PP Problem	7(1.4)
5. Had ANC problem, did not have treatment, had a IP problem, did not have treatment and then had a PP Problem	0(0)	Had ANC problem, did not have treatment, had a IP problem, did not have treatment and then did not have a PP Problem	5(1.0)
6. Had ANC problem, did not have treatment, did not have a IP problem, and then had a PP Problem	8(1.55)	Had ANC problem, did not have treatment, did not have a IP problem, and then did not have a PP Problem	8(1.55)
7. No ANC problem, had a IP problem, had treatment, and then had a PP Problem	20(3.9)	No ANC problem, had a IP problem, had treatment, and then did not have a PP Problem	25(4.8)
8. No ANC problem, had a IP problem, did not have treatment, and then had a PP Problem	11(2.15)	No ANC problem, had a IP problem, did not have treatment, and then did not have a PP Problem	11(2.15)
9.No ANC problem, did not have a IP problem, and then had a PP Problem	125(24.3)	No ANC problem, did not have a IP problem, and then did not have a PP Problem	54(10.5)
Total	250(48.6)		264(51.4)

Source: Primary survey, 2009 Jhagadia

4.5.1 The trajectory through which women had postpartum problem

Of the 514 study participants 48.6 percent women had experienced postpartum morbidity. There were major four trajectories through which women had experienced postpartum morbidity from pregnancy to postpartum period. There were 24.7 percent of women who had postpartum morbidity had no antenatal problem and had no postpartum problem. There were 11.45 percent women who travelled through another pathway where they had problem in antenatal period but did not have problem in intrapartum and had problem in postpartum period.

There were 9.9 percent women who had problem in antenatal period, had taken treatment, they also had intrapartum problem, had taken treatment and had postpartum problem. Also there were women who had problem in antenatal period, had not taken treatment, they had problem during intrapartum period, had taken treatment and then experienced morbidity in the postpartum period (however there were only 2 (0.4). A majority of the women who had postpartum morbidity were those who had no experiences of morbidity in the course of the pregnancy. Only 2.85 percent had intrapartum problem, have not taken treatment and had postpartum problem.

We can conclude that whether women had no complication in antenatal and intranatal period her chance of postpartum morbidity was high. Treatment during antenatal and intranatal was slightly protective in occurrence of postpartum morbidity.

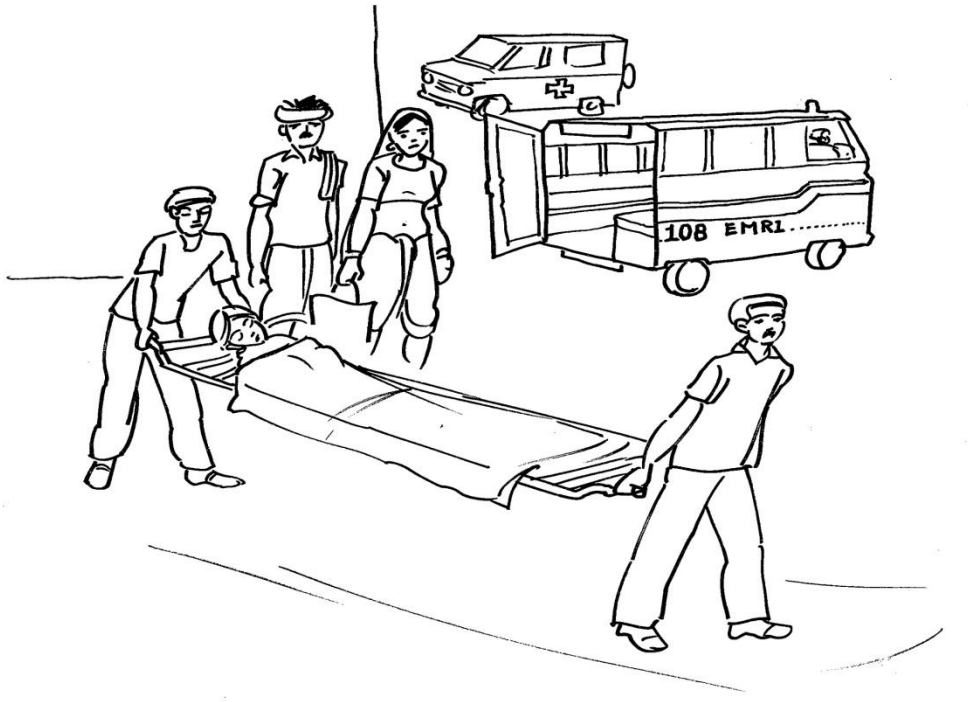
4.5.2 The trajectory through which women had no postpartum problem

Of the 514 study participants 51.4 percent women did not have experienced postpartum morbidity. There were major four trajectories through which women escaped postpartum morbidity. Just about a tenth of the women went through pregnancy and the postpartum period with no problems at all. More than a tenth (13.5%) of the women who had problem in antenatal period had taken treatment had problem in intrapartum period and had taken treatment and had found no postpartum morbidity.

Resolving antenatal problems or intrapartum problems through care seeking seem to have a protective effect on women for postpartum morbidity.

Case study-1 Maternal Death in Postpartum period

A tribal woman (a mother of two male children) aged about 26 years delivered her 3rd male baby at her natal home. She had received all ANC by the village health functionaries of SEWA-Rural. After sixth days of customary rituals, they were shifted to the husband's home. On the twelfth day of the postpartum period, she complained of early morning headache for which her husband applied some pain-balm. When the husband tried to wake her up later in the morning for preparing his tiffin, he found her unconscious. The members of the family tried to revive her but she did not respond. The neighbours and community gathered and arranged for 108 an emergency ambulance. She was shifted to the SEWA-Rural hospital around 11.30AM after two days.



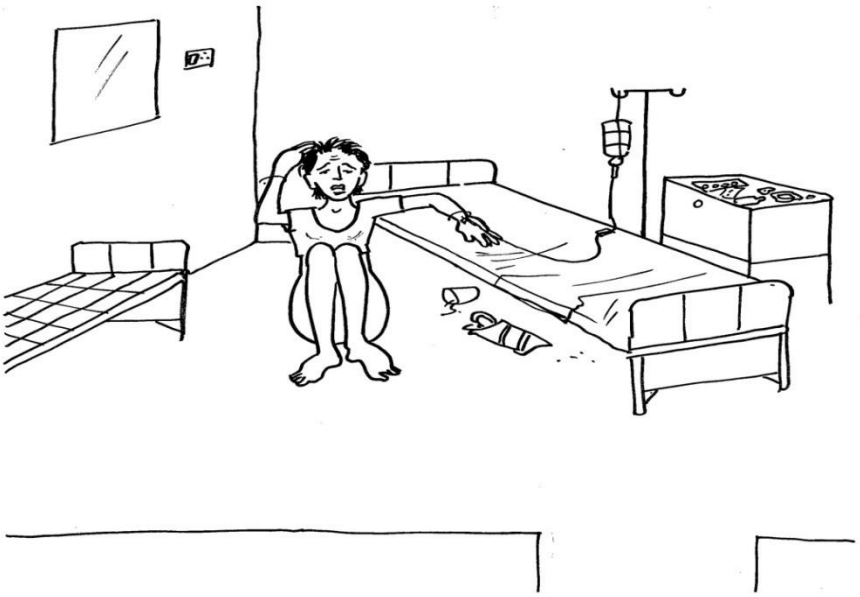
She was admitted in the intensive care unit (ICU) in an unconscious state and was seen by the gynaecologist who referred her to the physician. She was referred around 5:00PM to S. S. G. Hospital, Vadodara (a teaching hospital cum tertiary care centre about 110 km in a different district) where she succumbed to her illness around 9:00PM. The hospital/organisation has put a remark for cause of death due to Central Nervous system (CNS) involvement.

Case study-2: Mental and Emotional Health

A 24 year old tribal mother of two live male children (a poor illiterate woman deserted by her husband), was found to be pregnant by six months when visited by a *Sakhi* (health worker) during her routine field visit. Thus the antenatal care was started in the sixth month. The *Sakhi* found that she had conceived immediately after her abortion and was mentally disturbed. In her earlier pregnancies also she developed abnormal behaviour which apparently subsided after the deliveries.

She was behaving in a withdrawn manner, not bothered about personal hygiene and was not interacting with anyone. Her husband addicted to alcohol, is living in with another woman and has shifted to another village with her two sons. He was not looking after her and has taken away all the household items. However, her brother- in-law was supportive and used to provide her food etc.

On eight months her brother-in-law brought her to the SEWA-Rural (SR), with complaints that for the previous four days she had pain abdomen. She was admitted to the SR hospital and she had a still birth in April, 2009. After four days she was discharged. She went to her natal home from there she walked down to her husband's village but her husband had left their home and village. On the 14th day the *Sakhi* brought her again to the SEWA-rural hospital. She shared that in the morning she and SR supervisor had made a field visit of that village. Being a postpartum woman they made her visit and learnt that as her mental state was not good, she was bed ridden, not moving at all; her relatives and villagers presumed that she had passed away and gave her bath for the last rites. The field workers intervened and brought her to the hospital in 108 emergency ambulance services. She was admitted to the SR hospital.



A *Sakhi* posted at SR hospital informed that she was given proper wash and after four days they consulted a private psychiatrist at Bharuch district. After starting the psychiatric treatment she started feeling better and began talking. Her husband and her parental family members abandoned her and no one was there to take care of her. Her husband was requested to help referral but he refused to be of any help and wanted his wife to be discharged then and there itself and categorically told that he was not bothered if she lived or died in the process. She was referred to a specialised tertiary care level mental hospital at Baroda (110 km away) for which her brother –in-law and the supervisor facilitated the whole process.

As per the rules of the mental hospital, a relative's presence is a prerequisite before they admit a patient. The *Sakhi* of SR went and stayed with her for a few days. She was treated for her psychological problem as well as for sepsis and was discharged almost after one week. No one was willing to keep her. She stayed at her natal village (her old father staying with son and daughter-in law) were not willing to keep her as whenever she is sick she comes back to them and after recovery she runs back to her husband. Now husband is in a live- in relationship with another woman and has deserted her. For some days she stays at her natal village and people give her food .After a few days, she went to her husband's village where most of the time her brother-in-law provides her food, water and clothes. The community also provides her food. A few days back, she walked on her own to the SR hospital for hospitalisation. She came with her clothes etc. She was seen as an outdoor patient.

At SR hospital ward she was in a miserable state, looked pale, her face was puffy, swollen legs; her lower lip was wounded, had complaints of severe pain from back to knee. She was hardly able to utter a few words. After a gap of a month in SR hospital's OPD she looked a little better in comparison to her previous condition.

Her two children have been taken away by her husband; she has had abortion during that pregnancy during which she had some psychological problem though post abortion she was apparently normal as per history by the field workers and brother-in-law. Again after the abortion, she got pregnant, had a stillbirth, her house was made barren; husband took away all the household things, removed the roof tiles and tin shed over the roof, her all belongings and her children!

In all her struggle, her husband's elder brother was the only supportive person who provided her food, water, clothes and at times brought her to SR hospital and took her to Baroda hospital. She was labelled as a mad woman by her husband and her parental family and the community stigmatized her as a mad person. Not only her reproductive rights, but the basic rights of life and human dignity have been denied to her.

The matter was discussed with Community Health Physicians and the possibility to shift her to a state shelter home was explored by the organisation.

CHAPTER 5
DISCUSSION AND CONCLUSIONS

5. Introduction

Information on maternal morbidity at home could provide the evidence necessary for planning safe motherhood outreach activities in developing countries.[20] The study was aimed to estimate the prevalence of self reported postpartum morbidity and its determinants among the women of reproductive age in Jhagadia block of Gujarat. We explored the association of demographic, social, economic and obstetric predictor variables with the women who had postpartum morbidity and those who did not have the postpartum morbidity. Women's experiences of various types of morbidity during antenatal, intra-natal and postpartum periods were measured. The pathways to postpartum morbidity from the time of pregnancy were traced to examine the impact of morbidity and availability (and use of) treatment options at various stages of pregnancy.

This chapter discusses our major findings and makes recommendations for improving the existing safe-motherhood programme of the SEWA-Rural, Jhagadia. It is expected that the findings and recommendations will be relevant for reducing postpartum morbidity in similar settings elsewhere in India.

5.1 Prevalence of postpartum morbidity

Among the 514 respondents who participated in the study, 48.6 percent of the women experienced morbidity in postpartum period. It is important to note that half of these women were not having any complications during antenatal period and intranatal period but had problems during postpartum period. These findings show that irrespective of preceding antenatal, intranatal periods, women are more vulnerable in postpartum period.

In India, various studies conducted by Patra et al. in Haryana, Rama Padma's study in rural Andhra Pradesh and Bang et al. study in Maharashtra show a prevalence of postpartum morbidity ranging from 74 percent, 61 percent and 42.9 percent respectively.[18,19,20] The postpartum prevalence in the study undertaken was found lower than the Patra et al., study[18] and Rama Padma's study[19] while closer to the Bang et al, study.[20] The authors Patra et al, stated that the reason for high prevalence could be due to

over-reporting which might be due to the fact that, this being an active follow up study, subject's perception or behaviour may have been modified and they might have felt obliged to report something.[18] The Bang study was prospective observational study nested in a neonatal care trial each woman was observed from pregnancy to postpartum and each event was recorded by village functionaries evidence based reporting, may be more acurate.[20] While the study findings are self reported morbidity during the cross sectional survey, there is a chance of underreporting of complains due to women's own perception of considering a few illnesses as a part of delivery process that every woman experiences and one need not report the same. Some of the complaints might be over reported as women perceived her experience as more serious, and therefore mentioned. To avoid recall bias the study period was confined to three months.

The postpartum morbidity is closely linked with the maternal health in the antenatal period and intranatal period. The incidence of morbidity during this period was also measured. In this study we found 52 percent women had complications during antenatal period. Forty percent women reported complications during intra-natal period. Morbidity observed in intranatal period was almost two times more than the 17.7 percent observed in the Bang study.[20] In contrast , the Andhra study reports antenatal morbidity of 87.7 percent, intra-partum morbidity of 43.4 percent in Mahbubnagar (less developed district) while antenatal morbidity of 58 percent and intra-natal morbidity of 23.4 percent observed in Guntur district (developed district).[19] This study shows highest reporting of morbidity with vast differences across development categories. Over all a wide range of variations were observed between the studies. This might be due to methodological differences caused by different definitions, misclassifications of illnesses or the use of different means for identifying samples.

Postpartum morbidity was higher in the younger ages and it declined with age. It was higher amongst those women who were multiparous and had short and extended birth intervals. Examining the relationship of social variables with postpartum morbidity we found that women of scheduled castes had least postpartum morbidity compared to the scheduled tribe and other backward caste. A possible reason could be that the health functionaries might not be visiting scheduled caste women, while in the programme with known vulnerability of tribal women due efforts were made to contact them, they have

access to services at community level and therefore report better. It is important to note that none of the variables of demographic, social economic status of women and their household found statistically significant.

5.1.1 Prevalence of morbidity during antenatal, intranatal and postpartum period

It was observed that 52 percent of women experienced complications in the antenatal period**.** This is the stage when women had experienced more morbidity. The significant problems women experienced during antenatal period were nutritional deficiency related problems which included complaints such as anaemia, weakness, night blindness and breathing problems. The second frequent complaint was false labour pain, followed by pre-eclampsia (oedema and convulsion), headache, infectious disease included complaint of jaundice, malaria (no case of TB reported), burning micturation and antepartum haemorrhage.

Similarly, forty one percent of the women experienced some form of complications in the intra-partum period. The other significant complaints reported by women were prolonged labour which was the most frequently occurring complication. This findings were quite similar to findings[18] of study Dr. Patra et al, little higher than the findings[20] of the study of Bang et al. The study conducted by Bhatia, 1995 reports about 18.0% women had at least one problem during delivery and 23.0 percent had problem during postparatum.[53] The prevalence found quite low in comparison of the other studies findings. The next most frequently occurring condition was *Gabhraman* (a traditionally perceived condition described as a feeling of heightened anxiousness accompanied with severe palpitations), weakness, premature rupture of membranes, perineal tear and had a preterm delivery. The remaining intrapartum problems which constituted a very small percentage were mostly due to the type of delivery and malpresentations of the foetus.

As mentioned earlier, forty eight percent of women in study had experienced postpartum morbidities. Anaemia was the most frequently reported postpartum morbidity with 29.6 percent in the study women which was lower than the study of Patra et al. which reported 43 percent anaemia -as the most common problem.[18] The next most frequently reported condition was fever – 9 percent in the study undertaken. This is lower than the 21 percent that reported by Patra et al.[18] While 7.6 percent had breast problems

which included breast engorgement, cracked nipple, retracted nipple and breast abscess; this proportion was lower when compared to the 14 percent reported in the Patra et al. study and 18.4 percent in Bang et. al. study.[20] We have reported adverse events and one of the case- mastitis is reported where the woman had suffered more than two months, has to undergo surgical interventions and had disfigurement of breast which may have adverse effect on her psychological health. Seeing the prevalence of breast problems in the Bang study which is quite similar to the present study settings, we can assume that due to culture of silence there could be more hidden cases of breast problems that need to be explored further. It was observed that among tribals, breast feeding immediately after child birth is not encouraged and women wait for more than 24 hours[54] and express out the colostrums (personal observation) before putting the child to the breast. This practice could increase the risk of breast related problems in the population.

Case Study-3 Breast problem

A 20 year old tribal woman from an interior village delivered her second baby at SEWA-Rural hospital. The delivery and stay at hospital were uneventful. After her discharge, she developed right sided breast abscess for which she/her family tried some traditional remedies (abstracts of plant) which worsened her condition. After a few days, her husband took her to a qualified private practioner who treated her and recommended a surgical intervention. The husband took her back to home without further consultation/incision as advised. The condition of her breast abscess further deteriorated and she was referred to the mobile clinic of SEWA-Rural by the *Sakhi* and *Setu Karyakar* (Village based health functionaries). This referral happened after about one month of her delivery and subsequent development of her breast abscess.

The doctor in the mobile decided to bring the patient to the base hospital of the SR in view of the severity of her condition necessitating immediate surgical treatment. The entire right breast appeared to be disfigured and involved with changes which mimicked a condition suggestive of chemical injuries/burns .The skin over the breast had sloughed off at several places with involvement of the major part of the tissue and the overlying skin which gave semblance of a major malignant process to the lay people.

As it was not the day of the scheduled weekly visit of the general surgeon at SR hospital, she was taken to another trust hospital in nearby town she was operated upon, provided immediate post operative care and was shifted to SR hospital for further postoperative care for a couple of days. Throughout the treatment at different hospitals/places, her family members including her husband, her mother, her two year old child and the neonate had to physically move around with her. The entire expenditure was borne by the SR hospital. After one week she came for follow up visit and the consultant surgeon informed that she has responded well to the treatment.

In this study 5.6 percent women had complaints of infection which included obstetric(s) wound infection and puerperal sepsis and the Bang et al. study[20] reports twice this proportion. A Wardha hospital based study conducted by Chhabra et al., reported puerperal sepsis 51percent.[24] In these settings reasons for high prevalence of sepsis could be evidence based reporting or being a tertiary care hospital case reporting high and geographic area coverage widespread.

This study had 3.7 percent reporting postpartum haemorrhage (PPH) bleeding after childbirth which was again half of the incidence of Patra et al findings 7 percent[18] while in Bang et al., it was found 15.2 percent. The Chhabra et al, Wardha hospital based study reported PPH 28 percent.[24] One of the reasons could be that in a hospital based study has a selection bias in terms of including all the high risk morbidities within its ambit.

5.1.2 Anaemia as major postpartum morbidity

In the study undertaken anaemia (severe anaemia and sickle cell disease were grouped together) was the most frequently reported (29 percent) postpartum condition. The NFH-3 reports that 55 percent women in India have anaemia and is high for women with no education, women from schedule tribes and women in the two lowest wealth quintiles. And it has risen almost by 5 percent since then in both groups.[8] The Sample Registration System 1997-03 reports a major cause of maternal mortality in rural India as anaemia (24 percent) .[17]

To establish the association further, an analysis was done by caste stratification with problem during antenatal, intranatal and postpartum morbidity-anaemia and postpartum morbidity other than anaemia. It was observed that 97 percent of the total study participants had consumed tablet iron- folic acid. There was reason to believe that women's lack of nutritional inputs predates the postpartum problems. We can say that in spite of TIFA consumption anaemia is highly prevalent. Perhaps women had high level of nutritional deficiency prior to their pregnancy so that the supplemental iron was not enough to rectify anaemia. Alternatively, women reporting consumption of IFA might not be consuming them in reality. There could be other reasons for the high prevalence of anaemia which need further exploration.

To know factors associated with morbidity during antenatal, intrapartum and postpartum periods, further analysis was carried out with the postpartum morbidity with anaemia and other than anaemia with the

demographic, social economic variables at the individual level. The husband's occupation was found statistically significant for morbidity in antenatal period while gravida and spacing found to be significant in the intrapartum period and TIFA for the postpartum morbidity other than anaemia. While examining treatment seeking behaviour and postpartum morbidity, it was found that those women who sought treatment during antepartum period had significant higher level of intrapartum problems. Those women who had not sought treatment for intrapartum period had a higher risk of postpartum problem anaemia. This could be indicative of the persistence of problems that do not get resolved in the antepartum period or subsequently.

5.2 Caste and morbidity during antenatal period

Caste was the only predictor which has shown strong statistical association with the morbidity during antenatal, intranatal and postpartum period having complications of anaemia. In order to determine the actual pathways by which caste operates on morbidity, the analysis using demographic, socio-economic status and delivery conditions related variables was repeated using caste as a stratifier.

Among the backward castes and STs, the women's husband's occupation was strong predictor of morbidity in the antenatal period. The woman whose husband was engaged in agriculture work had greater chance of developing complications in antenatal period compared to those whose women's husbands engaged in non-agriculture related work respectively. The reason could be that the income from the agriculture source would not be enough thereby affecting food intake and over all well being. Apart from this, to support the family women may be engaged in agriculture work which adversely affects their health during pregnancy.

5.2.1 Caste and morbidity in the intrapartum period

The predictors like vehicle at household level, gravida, spacing, delivery place, treatment in pregnancy, treatment in intranatal, and delivery types were stratified by caste to examine morbidity in intrapartum period.

While examining the vulnerability amongst the three caste groups it was found that the scheduled caste women who did not take treatment in intranatal period had four times greater risk having problem in those periods. Those women who had vehicle at household level had almost two time greater risk than

those who did not had, primiparous women had one point five time greater risk and those who had invasive procedures for the delivery had one point five times greater risk to have intrapartum morbidities than their counterparts.

The scheduled tribe caste women who were primiparous had two time risk to have morbidity in intrapartum period, those women had non institutional delivery had double the risk to have intrapartum morbidity, those women who did not seek treatment had three times greater risk of having postpartum morbidity. The women who had delivery through invasive procedure had more than two times risk to have intrapartum morbidity.

The other backward caste women, who had intrapartum problem, were the most vulnerable. Amongst this women who had not had institutional delivery, had five times greater risk to have intrapartum morbidity. Those women who had vehicle at household and birth spacing less than 24 months, had three time greater risk to have intrapartum morbidity. The other backward caste category includes women of backward caste, minority groups and other general category women together as they were in small numbers.

By examining these variables we can say that the other backward caste women had greater risk to have intrapartum morbidity. While the women of tribal caste had risk due to gravida (marriage at a younger age); low levels of institutional delivery. Schedule caste women have higher levels of institutional delivery and still higher levels of postpartum morbidity. This could be because the health care providers ignore their every day health needs and this may have long term adverse consequences that manifest in the postpartum period.

5.2.2 Caste and postpartum morbidity other than anaemia

For the postpartum morbidity other than anaemia schedule caste and schedule tribal women who had not taken treatment in intranatal period, were at greater risk to have these problem. While other backward caste women who had skilled birth attendant (institutional delivery) had greater risk to have anaemia in postpartum period. We can say that the other backward caste might not have got health services at the community level and when they reached institution at the time of delivery, by that time they were at risk and had anaemia which further aggravated their conditions.

The scheduled caste and other backward caste women who had not taken treatment in intranatal period were equally at risk while the scheduled tribe women had two times more risk. The other backward caste women and scheduled caste women who had spacing of less than two years were at more risk of getting postpartum morbidity other than anaemia.

Thus we can conclude that in the study area the caste dynamics operates in very subtle way. It seems that scheduled caste women are even lower than even the tribal women in terms of social hierarchy(personal observation) and this has direct adverse effect on the level of services provide to them. Majority of the village health workers are from tribal community and perhaps due to their restricted social interactions they were not providing services to the scheduled caste women and this could enhance their vulnerability.

5.3 Pathways to postpartum morbidity

The analysis of pathways to postpartum morbidity shows that those women who had problems during antenatal and intranatal periods had a lower chance of postpartum morbidity. That means problems during antenatal or intranatal periods expose them to the health system where they get services which reduce their risk. On the other hand, it was also found that some women who did not have problems during antenatal and intranatal periods did have problems in postpartum period. Clearly this indicates that it is difficult to predict which women will have problems during postpartum and that all women are at equal risk. It is therefore necessary that policy frameworks take into account vulnerability due to minority status in strategies for reducing maternal morbidity while continuing to focus on enhancing institutional delivery.

5.4 Limitations of the study

1. This study excludes women less than 18 years and those who had abortion or MTP. The prevalence of postpartum morbidity in such women was thus not measured.

2. During data collection, confidentiality was maintained. But in the case of adverse events (maternal death and hospitalisations), referrals were done to save the lives with due community support.

3. Self-reported maternal morbidity cannot provide exact estimates of prevalence and incidence of postpartum morbidity.

5.5 Strengths of the study

1. This study was community based.

2. The descriptive analysis gave direction of the exploring the pathways of the factors associated with pregnancy related morbidity which lead to postpartum morbidity and provided scope for programmatic improvement.

5.6 Conclusions: From the results of the study, we can conclude that amongst the women who had problems during antenatal period and postpartum period, their chances to get postpartum morbidity is low. However, women who had no problems during antenatal period and postpartum period did experience morbidity during postpartum period.

We can say that those women who had problems during antenatal period and or intranatal period were exposed to the system where they took treatment along with some health education which reduces the risk for postpartum morbidity.

It is important to note that those women who were not having any problems during antenatal period and intranatal period had postpartum problem. We, therefore, cannot presume which women will be at risk to have postpartum problems. Hence there is need to provide comprehensive postpartum care to all the women irrespective of institutional or non-institutional delivery.

At the same time women who had exposure to health functionaries during antenatal and intranatal period, seemed to have a protective effect in terms of their not having problems in the postpartum period. Hence it is imperative that the preventive and corrective measures should be taken during antenatal and intrapartum periods by enhancing institutional deliveries. It is considered that minorities are vulnerable in most of the circumstances. In the study area there is a need for conscious efforts to be made by health functionaries to reach other backward caste women. Further inputs are required to ensure comprehensive health care and promotion of institutional delivery with care of the tribal women being quite vulnerable.

5.7 Recommendations

The study brings out certain critical areas and salient points which necessitate urgent attention of the policy makers, service providers and the society at large in similar and other settings:-

1. Anaemia having emerged as the single most important postpartum condition(largely determined by the nutritional intake before and during antenatal period), emphasizes the importance and strong need of remedial action in terms of systematic and sustained mechanism for detection of anaemia amongst girls and women supplemented with proper supply and availability of haematinics to them. The local self government /panchayati raj institutions and civil society organizations must be roped in for the same and also to ensure proper adherence to the nutritional support thus provided.

2. The study found in no uncertain terms that younger age groups have a clear correlation with higher post partum morbidity. The systemic and other measures are required to impress upon the society the need to delay marriages and ensure proper spacing of births to, *inter alia*, reduce maternal morbidity.

3. Societal interventions would be required to act on the emergent need to plan families. All ongoing interventions in health and development must communicate and emphasize to keep the family size small in view of the finding of a correlation of post partum morbidity with a high parity.

4. All ongoing efforts for literacy and proper education of the womenfolk must be strengthened in view of clear association of illiteracy with high incidence of post partum morbidity. The government and non-governmental organizations need to be co-opted for the same.

5. Rather than seeing postpartum morbidity just as a 'medical' problem, the need to address most of the socio-economic and cultural determinants also is clearly underlined by the finding of higher prevalence of post partum morbidity in tribal women and those belonging to other backward castes.

6. The planners must understand and appreciate the crucial role of social capital and the social support systems available to the pregnant women reflected in terms of better maternal health, which has been brought out effectively in the form of a definite association of high postpartum morbidity in nuclear families in the predominantly rural setting.

7. The anecdotal experience reported in the study regarding (maternal death), breast abscess and postpartum psychosis were from the tribal community which might be by chance. Nevertheless, there is a need for regular counselling and health education for prevention and timely referral in case of maternal morbidity.

8. It has been also observed that women belonging to scheduled caste are detected to have postpartum morbidity only when they report to the health centre/hospital for their problems. This may be indicative of a low level of (even denial of) antenatal and intranatal services to these women due to stigmatisation and discrimination because of their minority status in the region. Health system workers have to be trained to identify and assist these groups in order to bring them within the system.

The lessons learnt from the study need to be adapted, adopted and scaled up in an appropriate manner in other areas also as they are applicable in most of the settings cutting across the geographical boundaries in the developing world.

REFERENCES

1. Centre for Reproductive Rights, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health,Westminster, London.[online].[cited 2008 Dec 17]; P-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/
2. Vora KS, Mavalankar DV, Ramani KV, Upadhyaya M, Sharma B, Iyengar S, et al. Maternal Health Situation in India: A Case Study, *J Health Popul Nutr* 2009 April; 27:184-01
3. United Nations Population Fund. Safe motherhood surviving child birth: But Enduring Chronic Ill Health [online]. [cited 2009 Feb 2]. Available from: URL: http://unfpa.org/mothers/morbidity. htm/ hidden/
4. The World Health Report 2005: Making every mother and child count. Geneva: World Health Organisation; 2005
5. Sample Registration system 2001-03[online]. [cited 2008 Oct 31]. Available from: URL: http://custom/qSRS2001- 03&sa /Search&cof / LW/ 3A780/
6. United Nations children's Funds. Maternaland perinatal death inquiry and response: empowering communities to avert maternal deaths in India, 2008
7. Human rights watch. No tally of the anguish: Accountability in maternal health care in India. 350 Fifth Avenue, 34th floor, New York, NY 10118-3299 USA. October, 2009, p 1-150
8. International Institute for Population Sciences (IIPS). National Family Health Survey (NFHS-3) 2005-06, India, Mumbai. [online]. [cited 2009 Oct 09]. Available from: URL: http:// nfhsindia.org/nfhs3. html/
9. Sample Registration system, 2001-03. Registrar General, India. [online]. [cited 2008 Oct 31]. Available from: URL: http:// customq/ SRS2001- 03&sa/ Search &cof/ LW/ 3A780/
10. SRS Bulletin, Sample Registration System, Registrar General, India, Vital Statistics Division, West Block-1, Wing-1, 2nd Floor, R.K. Puram New Delhi-110 060 Volume 43 No.1, Issue number 0971-3549, October, 2008. [online]. [cited 2009 Jan, 31]. Available from: URL:

http://censusindia. gov.in/Vital_ Statistics/ SRS Bulletins/ SRS Bulletins links /SRS Bulletin October2008.pdf/

11. SEWA-Rural. Annual narrative progress report: family centered safe motherhood and new born care project. Jhagadia; Gujarat, 2008
12. World Health Organisation. Improving maternal newborn and child health in the South- East Asia region, WHO. Regional Office for South-East Asia, 2005
13. United Nations of Children's Fund. Maternaland perinatal death inquiry and response: empowering communities to avert maternal deaths in India, 2008
14. Waterstone M, Bewley S, Wolfe C. Incidence and predictors of severe obstetric morbidity: case-control study. *BMJ* 2001; 322:1089–94
15. Wen SU, Huang L, Liston R, Heaman M, Baskett T, Rusen ID et al. Severe maternal morbidity in Canada, 1991–2001: maternal health study group, Canadian perinatal surveillance system. *CMAJ* 2005; 173: 7
16. World Health Organisation. Improving maternal newborn and child health in the South - East Asia region. World Health Organisation. Regional Office for South-East Asia; 2005
17. SRS Bulletin, Sample Registration System, 1997-03 Registrar General, India, Vital Statistics Division, West Block, 1, Wing 1 2nd Floor, R. K. Puram, New Delhi-110 066
18. Patra S, Singh B, Reddaiah VP. Maternal morbidity during postpartum period in a village of north India: a prospective study. Trop Doct. 2008; 38: 204-08
19. Padma RG. Maternal Morbidity in Rural Andhra Pradesh. Centre for Economic and Social Studies, Hydrabad 2004; Working Paper 63: 04-34
20. Bang RA, Bang AT, Reddya MH, Deshmuka MD, Baitulea SB, Filippib V. Maternal morbidity during labour and the puerperium in rural homes and the need for medical attention: a prospective observational study in Gadchiroli, India. BJOG: *Int J Obs Gynae* 2004; 111: 231-8
21. Prabhu TR, Asokan TV, Rajeswari A. Postpartum psychiatric illness. *J Obstet Gynecol India* 2005; 55- 4: 329-32

22. Patel V, Rodrigues M, DeSouza N. Gender poverty and postnatal depression: a study of mothers in Goa, India. *AM J Psychiatry* 2002; 159:43-47

23. Vallely L, Ahmed Y, Murray SF. Postpartum maternal morbidity requiring hospital admission in Lusaka, Zambia-a descriptive study. *BMC Pregnancy and Childbirth* 2005; 5:1

24. Chhabra S, Varma SP, Bhalla R. Quality of postpartum care. *J Obstet Gynecol India* 2005; 56- 2: l 2006- 142

25. Chhabra P, Guleria K, Saini NK, Anjur KT, Vaid NB. Pattern of severe maternal morbidity in a tertiary hospital of Delhi, India: a pilot study. *Trop Doct* 2008; 38: 201-04

26. 'Saving Mothers' Lives: What works field guide for implementing best practices in safe motherhood. The White Ribbon Alliance for Safe Motherhood, India. CEDPA Best Practices Sub-committee, September 2002

27. Ved R, Dua AS. Review of women and children's health in India: Focus on safe motherhood. NCMH Background Papers. Burden of Disease in India, Ministry of Health & Family Welfare, Nirman Bhawan, Maulana Azad Road, New Delhi 110011, India. September 2005; p 85-011

28. National Rural Health Mission (2005-2012) Mission Document. [online]. [cited 2009 Oct 25]. Available from URL: http:// mohfw.nic.in/NRHM/Documents/NRHM Mission Document.pdf/

29. Maternal and perinatal death inquiry and responses: Empowering communities to avert maternal deaths in India. United Nations Children's Fund, 73 Lodi Estate, New Delhi, India, June 2005

30. Mavalankar D, Vora K, Prakasamma M. Editorials: Achieving Millennium Development Goal 5: Is India serious? *Bulletin of the World Health Organisation* 2008; 86

31. Commission on the Social Determinants of Health (2006) Summary of Proceeding: Fifth Meeting of the Commission on the Social Determinants of Health. Nairobi Kenya 26-30th June. Geneva: World Health Organisation. [online]. [cited 2009 Oct 12]. Available from: URL: http://who.int/social_determinants/en/

32. Better off Dead? A report on maternal morbidity from the UK all party parliamentary group on population, development and reproductive health, Room 563 Portcullis Houses, House of Commons, London SW1A 2LW UK; May 2009

33. Fortney JA., Smith JB., Measuring Maternal Morbidity; Safe motherhood Initiatives: Critical Issues. p 43-50

34. A Dictionary of Epidemiology. Last ed. Oxford University Press: John M; 1995. P. 180. [online].[cited 2009 Jan]. Available from: URL: http:// www. biblio. com/ books/ 50365161.html

35. Dutta DC. Epidemiology of obstetrics. Text book of obstetrics including perinatology and contraception, 5th Edition, 2001; p 647.

36. WHO (1989), Measuring reproductive morbidity Report of a technical working group (unpublished document WHO/MCH/90.4): quoted in: Bulletin of the World Health Organisation vol. 78 no. 5 2000, (www. who. int/ bull3tin/ archives/ volume785/en/ index html)

37. Carla Abouzahar. World Health Organisation. Geneva, Switzerland. *British Medical Bulletin* 2003; 67:1-11

38. World Health Organisation. [online]. [cited 2009 June30]. Available from: http://who.int/reproductive-health/ unsafe abortion / map.html/

39. United nations children's fund, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health, Westminster, London.(online).[cited 2008 Dec 17]; p-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/

40. Averting Maternal Death and Disability Programme/Raise initiatives: Columbia University, Mailman School of Public Health, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health, Westminster, London.(online).[cited 2008 Dec 17]; p-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/

41. IPAS protecting women's health advancing women's reproductive rights, morbidity form unsafe abortion, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health, Westminster, London. [online].[cited 2008 Dec 17]; p-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/

42. UK Department for International Development, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health, Westminster, London.[online].[cited 2008 Dec 17]; p-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/

43. Malaria consortium Disease Control. Better Health, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health, Westminster, London.(online).[cited 2008 Dec 17]; p-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/

44.The Royal College of Midwives, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health, Westminster, London.(online).[cited 2008 Dec 17]; p-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/

45. The United Nations Population Fund (UNFPA), Technical Division of UNFPA, submission of evidence-Hearings into Maternal Morbidity, All Parliamentary Group-Population, Development and Reproductive Health, Westminster, London. (online).[cited 2008 Dec 17]; p-2. Available from: URL: http:// www.appg-popdevrh.org.uk/ Publications/Maternal/Morbidity Hearings/Maternal Morbidity Hearings/

46. United Nations Children's Fund, The state of the world's children 2009: Maternal and Newborn Health. [online]. [cited 2009 Jun 30]. Available from URL: Http://unicef.org/sowc09/report/report/php/

47. Iyenger K and Iyengar SD, Research needs in maternal morbidity: Global forum for health research forum 8, Mexico City, November 2004

48. Khan KS, AbouZahar C. Global burden of maternal death and disability. *Br Med Bull* 2003, 67:1-11

49. Khan KS, Wojdyla D, Say L, Gulmezoglu AM, Van Look PF WHO analysis of causes of maternal death: a systematic review. *Lancet* 2006, 367:1066-74

50. Saha KB, Chatterjee Saha U. Concern for postnatal care services-usually a lesser valued service in rural areas (A study among the primitive Lodha tribe of West Bengal). *Tribal Health Bulletin* 2004; 10: 26-02

51. Bharuch district Panchayat, Gujarat Government. [online]. [cited 2009 Oct 8]. Available from: URL: http:// bharuchdp. gujarat. gov.in/ Bharuch/ enghlish/statistics/annual-report/brief-into-htm/

52.Wolrd Health Organisation, Regional Office for South East Asia, Health Situations and Trends Assessment Health Situation, Basic Indicator 2002 (website http:// searo. who.int/ n/Section1243/Section1382/Section1386_5527.htm accessed on 30, June, 2009)

53. Bhatia JC. Levels and determinants of maternal morbidity: results from community based study in southern India. *Int J Gynae Obs* 1995; 50: 153-63

54. Zodpey SP, Deshpandey SG, Vasudeon ND. Breast-feeding practice in tribal community of Melghat region in Maharashtra State. *Indian J Public Health* 1996; 40: 120-25

APPENDIX I

(I) Pregnancy related morbidity experience

Types of morbidity women had during antenatal period (n=514)

Sr. No.	Morbidity	Women had morbidity during antenatal period (%)		
		Yes	No	Total
1	Weakness	143(27.8)	371(72.2)	514 (100.0)
2	Anaemia	65 (12.6)	449 (87.4)	514 (100.0)
3	False Labour Pain	41(8.0)	473(92.0)	514 (100.0)
4	Oedema	34(6.6)	480 (93.4)	514 (100.0)
5	Headache	32(6.2)	482(93.8)	514 (100.0)
6	Night Blindness	30(5.8)	484(94.2)	514 (100.0)
7	Burning Maturation	22(4.3)	492(95.7)	514 (100.0)
8	Malaria	15(2.9)	499(97.1)	514 (100.0)
9	Jaundice	9(1.8)	505(98.2)	514 (100.0)
10	Ante partum haemorrhage	5 (1.0)	509 (99.0)	514 (100.0)
11	Breathing Problem	4(0.8)	510(99.2)	514 (100.0)
12	Convulsion	2(0.4)	512(99.6)	514 (100.0)
13	Other Complication	62(12.1)	452(87.9)	514 (100.0)

Women had morbidity during postpartum period (n=514)

Sr. No.	Morbidity	Women had morbidity (%)		
		Yes	No	Total
1	Anaemia	150 (29.2)	364 (70.8)	514 (100.0)
2	Backache	52 (10.1)	462 (89.9)	514 (100.0)
3	Breast engorgement	34 (6.6)	480 (93.4)	514 (100.0)
4	Fever	31 (6.0)	483 (94.0)	514 (100.0)
5	Puerperal sepsis	25 (4.9)	489 (95.1)	514 (100.0)
6	Urinary tract infection	17 (3.3)	497 (96.7)	514 (100.0)
7	Lower abdominal pain	16 (3.1)	498 (96.9)	514 (100.0)
8	Mild postpartum haemorrhage	14 (2.7)	500 (93.3)	514 (100.0)
9	Pyrexia of unknown origin	15 (2.9)	499 (97.1)	514 (100.0)
10	Postpartum haemorrhage	5 (1.0)	509 (99.0)	514 (100.0)
11	Obstetrics wound infection	5 (1.0)	509 (99.0)	514 (100.0)
12	Headache	5 (1.0)	509 (99.0)	514 (100.0)
13	Cracked nipple	5 (1.0)	509 (99.0)	514 (100.0)
14	Retracted nipple	4 (0.8)	510 (99.2)	514 (100.0)
15	Sickle cell disease	3 (0.6)	511 (99.4)	514 (100.0)
16	Lower respiratory tract infection	3 (0.6)	511(99.4)	514 (100.0)
17	Mastalgia due to boils	2 (0.4)	512 (99.6)	514 (100.0)
18	Prolapse of uterus	2 (0.4)	512 (99.6)	514 (100.0)
19	Perineal tear	2 (0.4)	512 (99.6)	514 (100.0)
20	Constipation	2 (0.6)	511 (99.4)	514 (100.0)
21	Cold	2 (0.4)	512 (99.6)	514 (100.0)
22	Postpartum psychosis	1 (0.2)	513 (99.8)	514 (100.0)
23	Severe anaemia	1(0.2)	513 (99.8)	514 (100.0)
24	Breast abscess	1(0.2)	513 (99.8)	514 (100.0)
25	Calf muscle pain	1 (0.2)	513 (99.8)	514 (100.0)
26	Upper respiratory tract infection	1 (0.2)	513 (99.8)	514 (100.0)
27	Gabhraman	1 (0.2)	513 (99.8)	514 (100.0)
28	Acidity	1 (0.2)	513 (99.8)	514 (100.0)
29	Gastritis	1 (0.2)	513 (99.8)	514 (100.0)
30	Piles	1 (0.2)	513 (99.8)	514 (100.0)

APPENDIX II

Prevalence and determinants of postpartum morbidities in rural/tribal block of Jhagadia, Bharuch, Gujarat.

Achutha Menon Centre for Health Science Studies,

Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, Kerala 695011.

WRITTEN INFORMED CONSENT FORM

I am_____[name of *Setu Karyakar*, data collector] conducting interviews for the study aiming to know about 'Prevalence of self reported postpartum morbidities in our block Jhagadia', among lactating women like you who have given birth during the past three months.

I am conducting the interview on behalf of Ms. Gayatri Giri, a postgraduate student of Master of Public Health studying at Achutha Menon Centre for Health Science Studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology at Trivandrum, Kerala. As a part of her MPH course requirement, she is conducting this study. Her study objectives are to know, what postpartum morbidities do women experience and how they express about them? What are the reasons for these self reported postpartum morbidities? What is their health seeking behaviour for the same? Whether women utilize health care services or not?

I would like to interview you in this regard. This interview will take approximately 30 minutes. There is no medical checkup, investigation done in this interview. While there is no direct benefit for you individually by this interview, but if you are found to have severe undiagnosed or untreated disease and need help from a doctor you will be referred to SEWA-Rurals' base hospital or wherever you are willing to go. If you want to have any health related information then I will be glad to provide it.

It is possible that the findings of the study will enhance scientific knowledge which may be used to improve health programmes and policies for larger benefit of the community in the long run.

The information given by you will not be disclosed to anyone under any circumstances anywhere in the public at any time. All information obtained from this interview will remain confidential and will be used for research purpose only. You can choose to or not to answer any of the questions and free to quit the interview at any stage if you feel so, unconditionally. Your participation in this study is purely voluntary.

If you have any queries or doubt please feel free to get them clarified. I will try my level best to answer all of your queries right now or in future as well. Further if you have any queries then contact Ms. Gayatri Giri, her mobile phone number is 09746265969. In case you need any clarifications about her credentials or the study, you can also contact Dr. Anoop Kumar Thekkuveettil, Member Secretary of the Institutional Ethical Committee at Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum. His phone no is 0471-2520259.

Are you willing to participate in this interview?

Yes **No (Circle)** if yes, then sign here

_____

Signature or thumb impression of the participant.

(Full name, Address)

Date:

Place:

…….

Signature of Witness

(in case of oral consent)

(Full name, Address)

Date:

Place:

…….

Signature of Investigator

(Full name, Address)

Date:

Place:

APPENDIX III

CONFIDENTIAL

INTERVIEW SCHEDULE

Achutha Menon Centre for Health Science Studies,
Sree Chitra Tirunal Institute for Medical Sciences and Technology,
Thiruvananthapuram, Kerala 695011.

Prevalence and determinants of Postpartum morbidity among rural/tribal women of Bharuch district, Gujarat

Name of *Setu Karyakar* (interviewer)……. Interview Schedule No.:……..

Date of current delivery: / /2009 Date of interview: / /2009

Name of the Village:……. Name of Faliya:……...

PART 1 A: DEMOGRAPHIC AND SOCIO ECONOMIC CHARACTERISTICS:

Sl.no	Questions	Options		Code
1.	Name of the respondent			
2.	What is your age?	☐☐ (Please tell it in completed years as on today)		
3.	Which is your caste?	1. SC	3.OBC	
		2. ST	4.General	
4.	What is your marital status?	1. Married	4. Unmarried	
		2. Divorced	5. Deserted	
		3. Separated	6. Other (specify)	
5.	What is type of your family?	1. Nuclear	2. Non-nuclear	
6.	How many adult women live in your household other than you? (this is the house where she is being interviewed)	..... Women (the number of women stated by the respondent)		
7.	What is your educational status?	1. Illiterate	8. Non-technical diploma not equivalent to degree.	
		2. Literate without education		
		3. Below primary (Nursery)	9. Technical diploma not equivalent to degree.	
		4. Primary (1to 4 Std.)		
		5. Middle (5 to 7 Std.)	10. Graduate and above.	
		6. Secondary (8 to 10 Std.)	11. Unclassified	
		7. HS/inter mediate/PU		

8.	What is your occupation (last one year's major time spent on)?	1. Not engaged in remunerative work outside the house (household work)	4. Other labour	
			5. Runs household level small shop	
		2. Agriculture work in own farm	6. House hold assistant (*Chakar* meaning maid servant)	
		3. Landless agricultural wage labour (daily wage earner)	7. Service: (white collar job)	
		8. Other (specify):		
9.	What is the educational status of your husband?	1. Illiterate	8. Non-technical diploma not equivalent to degree.	
		2. Literate without education		
		3. Below primary (Nursery)	9. Technical diploma not equivalent to degree.	
		4. Primary (1to 4 Std.)		
		5. Middle (5 to 7 Std.)	10. Graduate and above.	
		6. Secondary (8 to 10 Std.)	11. Unclassified.	
		7. HS/inter mediate/PU		
10.	What is your husband's occupation?	1. Doesn't do anything	5. Other labour	
		2. Not engaged in remunerative work outside the house.	6. Runs household level small shop.	
			7. House hold assistant/Servant.	
		3. Agriculture work in own farm.	8. Service: (white collar job).	
		4. Landless agricultural labour (daily wage earner).		
		9. Other (specify):		

PART 1 B: SOCIO ECONOMIC CONDITION (SLI*) (N.B. please circle the appropriate value)

Sl.no	Questions	Options [Circle] Score		Code
11.	What is the type of your house?	1. *Pucca.* [4] 2. Semi *Pucca.*[2] 3. *Kachha.* [0]		
12.	Do you have a separate room for a kitchen?	1.Yes [1] 2. No [0]		
13.	Do you own this house?	1.Yes [2] 2. No [0]		
14.	What is the main source of drinking water for members of your household?	**1. Pipe, hand pump, well in residence/ yard/plot [2]** **2. Public tap/hand pump/well [1]** 3. Other (specify)……[0]		
15.	What is the source of lighting in your house?	1. Electricity [2] 2. Kerosene/ gas /Oil [1] 3. Other (specify) [0]		
16.	What is the type of toilet facility used by your household?	1. Own flush toilet.[4] 2. Public/Shared flush toilet/own pit toilet.[2] 3. Shared/public pit toilet [1] 4. No toilet [0]		
17.	Which fuel do you usually use for cooking?	1. Gas (LPG)/ Biogas/ Electricity [2] 2. Coal/Charcoal/Kerosene [1] 3. Others [0]		
18.	How much Agricultural land does your family own?	1. > 5 acres [4] 2. 2-4.9 acres [3] 3. < 2 acres/acre area not known [2] 4. No agricultural land [0]		
19.	Does your family have irrigated land holding?	1. Some irrigated land [2] 2. No irrigated land [0]		
20.	Does your family have livestock?	**1. Cattle [4]** **2. Poultry [2]** **3. No [0]**		
21.	Does your family own any of the following durable goods?	1. Car [4]	11. Black and White TV [2]	
		2. Tractor [4]	12. Water pump [2]	
		3. Moped/scooter/motorcycle [3]	13. Bullock cart [2]	
		4. Telephone [3]	14. Thresher [2]	
		5. Refrigerator [3]	15. Mattress [1]	
		6. Colour TV [3]	16. Pressure cooker [1]	
		7. Bicycle [2]	17. Chair [1]	
		8. Electric fan [2]	18. Cot/bed [1]	
		9. Radio/transistor [2]	19. Table [1]	
		10. Sewing machine [2]	20. Clock/watch [1]	
22.	Does your family have a BPL card?	1.Yes 2. No		

Sl.no	Questions	Options [Circle] Score	Code
	Total score	(0-14 Low, 15-24 Medium, 25-67 High)	
	Standard of Living Index	**1. Low 2. Medium 3. High**	

****Source:** SLI Scale adopted by Dr. Abhay Bora Student 2006 AMCHSS and NFHS-II accessed from website on http://www. iipsenvis. nic.in /nlmar05 / water_ morb.pdf accessed on 10th January, 2009.

PART 2: ACCESS TO EMERGENCY TRANSPORT :

Sl.no	Question	Option	Code
23.	Do you have a vehicle at your household level, which can be used in case of emergency?	1.Yes 2. No	
24.	If yes then which type of vehicle you possess?	1. Tractor 2. Jeep 3. Motorcycle 4. Bullock cart 5. No vehicle 6. Other (specify)……	
25.	What kinds of vehicles are available at community level in case of emergency?	1. Tractor 2. Jeep 3. Auto Rickshaw 4. 108 Ambulances 5. Government bus 6. Bullock Cart 7. Any other (specify)……	

PART 3 (A): During pregnancy

Sr. No.	Question	Option		Code
26.	How many times have you got pregnant?	1/2/3/4/5/6/7/8/9/10/more than that.		
27.	Currently number of children alive.	..... Male ..... Female .....Total		
28.	What was the time gap between your present delivery and the last one?	..... (please write birth interval between these two delivery in exact months)		
29.	How many TT Injection did you take?	0 / 1 / 2 / Booster Dose		
30.	Did you receive tablate IFA?	Yes : 30 / 60 / 90	No Received	
31.	Did you Consume tablate IFA?	Yes : 30 / 60 / 90	Not Consumed	
32.	Was the Blood Pressure measured?	1. Yes 2. No		
33.	Was per abdominal check up done?	1. Yes 2. No		
34.	Did you have any risk / complication during this	1. Weakness	9. Night Blindness	
		2. Anaemia	10. Jaundice	

Sr. No.	Question	Option		Code
	pregnancy?	3. Oedema	11. Malaria	
		4. Headache	12. Breathing Problem	
		5. Convulsion	13. TB	
		6. APH	14 Cardiac Problem	
		7. False Labour Pain	15. Other Complication (Detail)	
		8. Burning Maturation	16. No Complication	
35.	If yes, had any complication from where did you take treatment ?	1. Home Remedy	8. FHW	
		2. Quacks	9. Private Doctor	
		3. TBA	10. Government Doctor	
		4. AWW	11. SEWA Rural Mobile Clinic	
		5. ASHA Worker		
		6. Health Worker	12. SEWA Rural Hospital	
		7. Link Worker	13. Not Taken	
36.	If, hospitalized was Blood Transfused to you?	1. Yes 2. No 8. NA		
37.	Did you get supplementary nutrition from the anganwadi during pregnancy?	1. Yes 2. No 8. NA		
38.	Did you eat the supplementary food given from the AWW during this pregnancy?	1. Regular 2. Irregular 3. Not Consuming 8. NA		

Part 3 (B) : Intranatal Period

Sr. No.	Question	Option		Code
39.	Place of Delivery (If delivery at home / On the way then ask question no. 41,42,43 and If delivery at hospital then ask question no. 44, 45)	1. Home	4. Private Hospital	
		2. SEWA Rural Hospital	5. Government Hospita1	
		3. Other Hospital / Trust Hospital	6. On the way	
If delivery at home / On the way				
40.	Who assisted you in this delivery?	1. Doctor (qualified)	4. Untrained 'Doctor'/quack	
		2. ANM/Nurse/midwife	5. Untrained Birth Attendant/Dai	
		3. Trained Birth Attendant	6. Family member/ Relative/Neighbour	
		7. Other (specify) ……	8. NA	
41.	Did dai use delivery kit (*mamta* kit) during delivery?	1. Yes 2. No 8. NA		
42.	Was external massage (*Kalla*) done by Dai during delivery?	1. Yes 2. No 8. NA		
If delivery at hospital				
43.	Who conducted the delivery in the hospital?	1. Gynaecologist		
		2. Doctor (qualified)		
		3. ANM/Nurse		
		4. Ayah		
		5. Trained Birth Attendant		
		6. Untrained 'Doctor'/quack 8. NA		
44.	How was your delivery done?	1. Normal vaginal delivery without episiotomy		
		2. Normal vaginal delivery with episiotomy		
		3. Vacuum or forceps		

Sr. No.	Question	Option		Code
		4. Caesarean section		
		Child – 1	**Child -2 (If Twins Delivery)**	
45.	What was the out come of the delivery?	1. Live Birth	1. Live Birth	
		2. Still Birth	2. Still Birth 8. NA	
46.	Sex of the child?	1. Male	1. Male	
		2. Female	2. Female 8. NA	
		3. Not Known	3. Not Known	
47.	Any problem / complication during this delivery?	1. Prolong Labour (Primi >12 hours & Multi >6 hours)	10. Mal presentation	
			11. Transverse lie	
		2. Convulsion during delivery	12. Cord around neck	
		3. Perinatal Tear	13. Absence Fetal Movement	
		4. Bleeding before delivery	14. Still Birth	
		5. Heavy bleeding during delivery	15. LSCS	
		6. Weakness	16. Retained Placenta	
		7. Gabharaman	17. Leaking PV (PROM)	
		8. Preterm Delivery	18. Any Other complication	
		9. Twins	19. No Complication	
48.	If you had any complication during Delivery, from where did you take treatment ?	1. Home Remedy	8. FHW	
		2. Quacks	9. Private Doctor	
		3. TBA	10. Government Doctor	
		4. AWW	11. SEWA Rural Mobile Clinic	
		5. ASHA Worker	12. SEWA Rural Hospital	
		6. Health Worker	13. Treatment Not Taken	
		7. Link Worker	88. NA	

Part 3 (C) : Postnatal Period

Sl. No.	Question	Option	Code
49.	Did any health worker visit your home after the delivery?	1. Not Visited 2. In first day (< 24 hours) 3. In first week (2-7 days) 4. After one week (≥ 8 days)	
50.	If yes, who has visited?	1. Local Health Worker 2. Link Worker 3. ASHA Worker 4. AWW 5. FHW 6. Other (Specify)	
51.	Did you have any problem / complication after delivery?	1. Yes 2. No	
52.	If yes, what were the complication / complications after the delivery?	(please write down response in the respondent's own words) …….....	

53.	Please read out the listed symptoms to the respondents, circle the appropriate answer.			Code
53.1.	Was there any excessive bleeding after delivery? Yes/No	1. How many cloths were changed?		
		2. Were where blood clots?		
		3. When did it start?		
		4. For how much time was the bleeding there?		

Sl. No.	Question	Option		Code
53.2.	Was there excessive thrust?	1. Yes 2. No		
53.3.	Did you have fits / convulsion? Yes/No	1. When did it start?		
		2. How many times did you have fits?		
		3. What was the duration of the fits?		
53.4.	Did you get any Fever? Do you get any fever? Yes/No	1. When did it start?		
		2. How many time did you eat in a day?		
		3. Was the fever throughout the day?		
		4. Was the fever high / less?		
		5 .Were there ups and downs the fever?		
53.5.	Was there any smell in the menses? Do you get smell in the menses? Yes/No	1. When did it start?		
		2. For how many days was there a smell?		
53.6.	Was there any abdominal distantion? Do you get abdominal distantion? Yes/No	1. When did it start?		
		2. For how much time?		
53.7.	Could you pass urine normally? Do you pass urine normally? Yes/No	1. When did the symptoms start?		
		2. For how much time did you not have it?		
53.8.	Was there any burning during urination? Do you get burning during urination? Yes/No	1. When did it start?		
		2. For how long?		
53.9.	Did you have any difficulty during urination? Do you have any pain during urination? Yes/No	1. When did it start?		
		2. For how long?		
53.10.	Did you passed urine dark yellow in colour? Do you pass dark yellow urine? Yes/No	1. When did it start?		
		2. For how long?		
53.11.	Did you have difficulty in breathing? Do you have difficulty in breathing? Yes/No	1. When did it start?		
		2. For how long?		
		3. Did you have difficulty in breathing while working?		
		4. Did you have difficulty in breathing while lying?		
53.12.	Did you have Gabharaman? Do you have Gabharaman ? Yes/No	1. When did it start?		
		2. For how long?		
53.13.	Did you have pain in calf? Do you have pain in calf? Yes/No	1. When did it start?		
		2. For how long?		
		3. Was the pain severe /moderate?		
53.14.	Did you have painful / sore breast? Do you have painful / sore breast? Yes/No	1. When did it start?		
		2. For how long?		
53.15.	Did you have crack nipple? Do you have crack nipple? Was the nipple inverted / is the nipple inverted? Yes/No	1. When did it start?		
		2. For how long?		
53.16.	Did you have lower abdominal pain? Do you have lower	1. When did it start?		
		2. For how long?		

Sl. No.	Question	Option		Code
	abdominal pain? Yes/No	3. Was the pain severe /moderate?		
53.17.	Did you have pain / spasms in private part? Do you have pain / spasms in private part? Yes/No	1. When did it start?		
		2. For how long?		
		3. Was the pain severe /moderate?		
53.18.	Did you get yellow / sallow complexion? Do you have yellow / sallow complexion?	1. Yes 2. No		
53.19.	Did you get nosia? Do you get nosia?	1. Yes 2. No		
		If yes, on empty stomach / after having meals?		
53.20.	Did you get vomiting? Do you get vomiting?	1. Yes 2. No		
53.21.	Was there loss of appetite? Is there loss of appetite?	1. Yes 2. No		
53.22.	Was there any opening of stitches (Caesarean / Episiotomy)? Are any stitches of Caesarean / episiotomy open?	1. Yes 2. No		
53.23.	Did you have pain during sexual intercourse? Do you have pain during sexual intercourse?	1. Yes 2. No		
53.24.	Did you have backache? Do you have backache? Yes/No	1. When did it start?		
		2. For how long?		
53.25.	Did you have headache? Do you have headache? Yes/No	1. When did it start?		
		2. For how long?		
53.26.	Did you have prolapse of uterus? Do you have prolapse of uterus? Yes/No	1. When did it start?		
53.27.	Did you pass urine drop by drop? Do you pass urine drop by drop? Yes/No	1. When did it start?		
53.28.	Did you find it difficult to hold urine? Do you find it difficult to hold urine? Yes/No	1. When did it start?		
53.29.	Did you pass faecal matter thought urinary opening? Do you pass faecal matter through urinary opening? Yes/No	1. When did it start?		
53.30.	Has there been any loss of weight in more than 3 weeks?	1. Yes 2. No		
53.31.	Do you have cough for more than 3 weeks?	1. Yes 2. No		
53.32.	Are you on anti-tuberculosis treatment? Have you been on anti-tuberculosis treatment?	1. Yes 2. No		
53.33.	Do you have sickle cell anaemia?	1. Yes 2. No		
53.34.	Do you have unbearable pain in joints? Yes/No	1. When did it start?		
53.35.	Did you have generalised weakness? Do you have	1. Yes 2. No		

Sl. No.	Question	Option		Code
	generalised weakness?			
53.36.	Did you have cold? Do you have cold?	1. Yes 2. No		
53.37.	Did you have constipation? Do you have constipation?	1. Yes 2. No		
53.38.	Did you pass fresh blood in stool (piles)? Do you pass fresh blood in stool (piles)?	1. Yes 2. No		
53.39.	Did you feel withdrawn? Do you feel withdrawn?	1. Yes 2. No		
53.40.	Did you weep without any reason? Do you weep without any reason?	1. Yes 2. No		
53.41.	Did you laugh without any reason? Do you laugh without any reason?	1. Yes 2. No		
53.42.	Did you not breast feed the newborn ? Do you not breast feed the new born?	1. Yes 2. No		
53.43.	Did you not care for the newborn? Do you not care for the newborn ?	1. Yes 2. No		
53.44.	Was there any abnormal behaviour? Is there any abnormal behaviour ?	1. Yes 2. No		
Note : If answers 54.39 to 54.44 questions is yes, then go to page no. 10 and ask EPDS questions				

Part – 4 Information Regarding Awareness Govt. Schemes

54.	Do you know about any government scheme for pregnant women?	1. Yes 2. No	
55.	If Yes, name the scheme from which benefits were availed ?	1. *Chiranjivi Yojana* *2. Janani Suraksha Yojana* 3. Other (Specify) ..... 4. Not Applicable	

SIGNATURE OF INVESTIGATOR

DATE:……

PLACE:……..

NB: PART 5 POSTPARTUM MORBIDITY will be validated by the team of Dr. Shobhaben Shah, Training Coordinator, Dr. Dhirenbhai Modi, Community Health Physician, SEWA-Rural, Jhagadia and the researcher.

Comments of the team:

…….
……
……

SIGNATURE OF DOCTOR

DATE: / /2009

PLACE:…….

SIGNATURE OF DOCTOR

DATE: / /2009

PLACE:…….

SIGNATURE OF RESEARCHER

DATE: / /2009

PLACE:…….