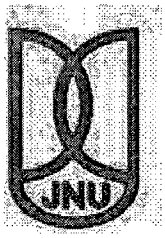
DETERMINANTS OF INSTITUTIONAL DELIVERY: A COMPARATIVE STUDY OF BIHAR AND ANDHRA PRADESH

Dissertation submitted to Jawaharlal Nehru University in partial fulfillment of the requirement for the award of the degree of

MASTER OF PHILOSOPHY

KESHAV KUMAR



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जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
Centre for the Study of Regional Development
School of Social Sciences
New Delhi-110067

CERTIFICATE

I, Keshav Kumar, certify that the dissertation entitled "**Determinants of Institutional Delivery: A Comparative Study of Bihar and Andhra Pradesh**" submitted for the degree of Master of Philosophy is my bonafide work and may be placed before the examiner for the evaluation.

Keshav Kumar
(KESHAV KUMAR)

Forwarded By

R K Sharma
PROF. R. K. SHARMA
(CHAIRPERSON)
Chairperson
Centre for the Study of
School of Social Sc
Jawaharlal Nehru U
New Delhi-110 06

Aslam Mahmood 20/7/09
PROF. ASLAM MAHMOOD
(SUPERVISOR)

Tel.: 26704463, Gram : JAYENU Fax : 91-11-26742586, 26741504

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(Keshav Kumar)
Centre for the Study of Regional Development
JNU, New Delhi

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CHAPTER- ONE
INTRODUCTION

Chapter-1

Introduction

1.1 Present situation of maternal death in India:

According to World Health Organization (2004), more than half a million women die every year from complications related with pregnancy and child birth and nearly all occur in developing countries and most of them are preventable. More than 25 per cent of global maternal deaths occur in India, making maternal mortality reduction one of the country's most severe health challenges. Maternal mortality is generally defined as the death of a woman during pregnancy and delivery or within 42 days of the end of pregnancy from a pregnancy related cause. The Maternal Mortality Ratio (MMR), the most widely used indicator to denote the extent of the problem, is estimated at 540 deaths per 100,000 live births in India (WHO, 2004). India suffers the highest absolute number of maternal deaths in the world; more than 136,000 women die from complication with pregnancy and its management each year in India.

A 1999 United Nations Population Fund report says an estimated 514,000 women die worldwide of pregnancy related causes, with India accounting for 25 per cent of the total. In spite of some of the best medical institutes and practitioners, the rate of death of women during child birth is the highest in India. 1.17 lakh of the global 5.36 lakh women died during child birth were from India in 2005.[1] The life time risk of a woman in India dying during pregnancy, delivery and through the first six weeks after delivery is 1 in 70. The risk to women in India is two times greater than that faced by women in the Asia region, sixty times that of women in developed countries, and over 600 times greater than that of women living in Sweden.[2]

In India, as many as 300 women die everyday due to pregnancy and childbirth complications. Over 90 per cent of these deaths are preventable. According to the statistics released by UNICEF, in India, a woman dies every five minutes during childbirth. When compared to the world scenario, this accounts to more than 20 per cent

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[1] United States Agency for International Development (2008); 'Maternal Health in India', Public Health Foundation of India, Accessed March 15, 2009, URL: http://www.mchstar.org/Factsheets/fact%20sheet%201%20(06-06-06).pdf.

[2] PTI (2009); 'Poor Access to Institutional Delivery Causes High MMR in India', *The Hindu,* New Delhi, April 10, 2009.

of the maternal deaths. In rural India, the figure is even higher at 619, according to United Nations Children Funds (UNICEF). Approximately, 30 million in the country experience pregnancy annually and 27 million have live births.[3] States with high Maternal Mortality Ratio (MMR) include Rajasthan, Madhya Pradesh, Orissa, Jharkhand, Uttar Pradesh and Bihar. Approaches leading to reduction in maternal deaths and safe motherhood need to address a diverse range of issues from awareness campaigns using community level mobilisers, improving infrastructure and providing reliable emergency obstetrics care, said a health ministry official. Prime Minister Manmohan Singh (in the year, 2007) observed that Maternal Mortality Ratio (MMR) in India was higher than that of Bangladesh.

For India, the National Family Health Survey of 1992-93 was the first to provide a national level estimate of 437 maternal deaths per 100,000 births for the two –year period preceding the survey (International Institute for Population Sciences, 1999). 99National Family Health Survey-II (1998-99) produced a maternal mortality estimate of 520. Maternal death ratios are highest in eight Empowered Action Group states of Rajasthan, Jharkhand, Uttar Pradesh, Bihar, Uttarakhand, Chhattisgarh, Madhya Pradesh and Orissa. Preventing deaths to mothers associated with pregnancy and child birth is one of the greatest challenges before the nation in the 21st century (USAID, Population Foundation of India).

The extent of institutional deliveries in India varies widely across the states or Union Territories; from the lowest of 18-24 per cent in Nagaland, Chhattisgarh, Jharkhand, Uttar Pradesh, Bihar and Uttarakhand to the highest of 86-98 per cent in Tamil Nadu, Goa, Pondicherry and Kerala. In Andhra Pradesh, Tripura and Jammu & Kashmir and in Union Territories of Daman & Diu, Andaman and Nicobar Islands and Lakshadweep; 60 per cent or more deliveries are taken in health institutions. On the other hand, in Assam, Madhya Pradesh, Meghalaya, Rajasthan, Orissa, Arunachal Pradesh and Haryana less than two- fifth of the deliveries are taken in institutions. The percentage of the institutional deliveries increases substantially with women's education and economic

[3] Krupp Karl and Purnima Madhivanan (2009); 'Leveraging Human Capital to Reduce Maternal Mortality in India: Enhanced Public Health System or Public- Private Partnership?' *Human Resource for Health*, Volume 7, Accessed online February 27, 2009; URL: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2662781

status, though the variation in the institutional deliveries by women's education is much conspicuous than that by women's economic status. The per cent of deliveries conducted by skilled personnel varies across the states or Union Territories from 30 per cent or less in Nagaland, Bihar, Chhattisgarh, Uttar Pradesh and Jharkhand to 70 per cent and approximately above in Jammu & Kashmir, Tamil Nadu, Goa, Kerala, Daman & Diu, Andaman & Nicobar Islands, Lakshadweep and Pondicherry.[4]

The extent of maternal mortality is an indicator of disparity and inequality in access to appropriate health care and nutrition services throughout a lifetime and particularly during pregnancy and child birth. National Population Policy 2000 and National Health Policy 2002 aim at reducing the maternal mortality ratio (MMR) to 100 per 100,000 live births from the current level of 400-500. Experts feel that at least 40 per cent of all pregnant women will experience of some types of complication during their pregnancies about 15 per cent of these complication will be potentially life- threatening and will require immediate emergency obstetric care. This is the very reason that the Indian Medical Association (IMA) wishes institutional delivery by skilled persons which can be performed anywhere in either public or private existing health services. Maternal death also compromises the health and survival of infants and children they leave behind. Although 88 to 98 per cent of maternal deaths are preventable, pregnancy remains the leading cause of maternal deaths. The death of a woman during pregnancy and child birth is not only a health issue but also a matter of social injustice. More than half a million women typically those who are poor, uneducated and living in rural areas or urban slums, continue to die every year during pregnancy and child birth. Ninety- nine per cent of these deaths take place in developing countries.[5]

1.2 Cause of maternal death:

WHO estimates show that out of the 529,000 maternal deaths globally each year, 136,000 (25.7 %) are contributed by India. This is the highest burden for any single

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[4] International Institute of Population Sciences (2006); *Reproductive and Child Health, DLHS-2, India, 2002-04*, Ministry of Health and Family Welfare, Government of India, New Delhi.

[5] Population Action International (2007); 'The Leading Cause of Death for Women in Developing Countries is Preventable', *Healthy Families Healthy Planet*, [Online: Web] Accessed September 7, 2007, URL: http://www.populationaction.org/Index.shtml

country. Study of Bhat shows that Maternal Mortality Ratio (MMR) is more in scheduled castes and tribal communities. Variation with income is somewhat inconsistent with the expectation that the poor will have higher mortality. There are no precise estimates of maternal mortality it is difficult to say with certainty that maternal mortality has gone down over time. But data has shown by various studies and also Bhat shows that there is a gradual decline in MMR. However direct measurement (RGI and NFHS) are inconsistent and do not show any decline. Maternal health is almost always seen as a technical and health issue which means that the medical establishment is regarded as best qualified to speak on it. Most maternal deaths occur between the last three months of pregnancy and the first week following delivery. The highest numbers of deaths occur on the first day after delivery. Fewer than half of deliveries (41%) are conducted in a health facility. The institutional deliveries among mothers belonging to lowest quintile of wealth index remain dismally low at 14 per cent and of scheduled tribes at 20 per cent compared to 85 per cent of mothers of wealthiest households. Only 36 per cent of mothers reported receiving post natal care from health personnel within 2 days of delivery of their last birth. This was as low as 13 per cent for the lowest quintile and 22 per cent for scheduled tribe women in the country (USAID, 2008). Nearly 80 per cent of causes of neonatal deaths like diarrhea, tetanus and asphyxias could have been prevented through vaccination or good hygiene (UNICEF Report).

India has been warned that at these rates the country will not be able to reach the 2015 maternity targets set up in Millennium Development Goal (MDG). The millennium development goal aims to reduce the number of women who die in pregnancy and childbirth by three quarters by 2015. It has been found that the rates of maternal death are high in the economically weaker section of the society. Also if the women are uneducated and uninformed, the chances of death are increased. With poor nutrition and lack of obstetric care, most poor women continue fighting for their lives with every delivery. In India, women, on an average, tend to get pregnant very early and have little control over their sexual or reproductive health. Low income makes access to better medical facilities difficult and social customs and traditions make post natal care a taboo.

The major cause of maternal deaths are excessive bleeding during child birth (common in home deliveries), obstructed and prolonged labor, infection, unsafe abortion,

disorder related to high blood pressure and anemia. Forty seven per cent of maternal deaths in rural India are attributed to excessive bleeding and anemia resulting from poor nutritional practices. Further contributing to maternal mortality rate, only 15 per cent of mothers receive complete antenatal care and only 58 per cent receive any iron tablets or syrup. In rural areas, 75 per cent of births still take place at home, mostly without any skilled help to ensure a safe delivery. Most of women get no care after deliveries and may suffer from infections and severe weakness leading to untimely deaths. Home births are still common in India accounting for almost 60 per cent of recent births (Fertility and Pregnancy, 2008).

Table- 1.1: Cause of maternal mortality: Indian studies and global pattern (all figures are in percentage), 2007

Source	**Registrar General of India 1998**	**MAINE (safe motherhood program)**
Causes of death	**National**	**Global pattern**
Haemorrhage	29.6	28
Anemia	19.0	-
Hypertensive disease of pregnancy	8.3	17
Puerperal sepsis	16.1	11
Abortion	8.9	19
Obstructed labor	9.5	11
Not classified	2.1	15
Other/ indirect	6.4	15
MMR per 100,000 live births	407	-

Source: State of maternal health in India; Prof. Dilip Mavalankar (2007)

Through India has made an appreciable progress in improving the overall health status of its population but it is far from satisfaction. The pace of decline of infant and child mortality on one hand and maternal mortality on other hand has been quite low. The complication of pregnancies and the births are found to be the leading causes of deaths and disability among women of reproductive age. Many women reach health facilities too late and in such serious condition that medical interventions are not effective.

As the world observes safe motherhood week, India paints a grim picture of mother care in view of high rate of maternal mortality and poor access of women to institutional delivery. According to the state of World's Children Report 2009 by UNICEF, poor rate of institutional delivery and lack of availability of skilled attendance is responsible for high rate of maternal mortality in India. Only 39 per cent of women go for institutional delivery in India, while 47 per cent of women get skilled attendants during delivery, report said. The poor access to institutional delivery and skilled attendants cause death of about 78,000 women in the country every year, the report said. They die due to excessive bleeding during delivery.

Poor health care facilities, gender discrimination has a direct negative impact on maternal health as it denies girls and women access to education. States with high maternal mortality include Rajasthan, Madhya Pradesh, Jharkhand, Orissa, Uttar Pradesh and Bihar. The most common responsible causes of maternal deaths are haemorrhage (ante partum or post partum), eclampsia, pre- eclampsia, infection, obstructed and prolonged labor, complications of abortion, disorders related to high blood pressure and anaemia. Haemorrhage is the most important cause for maternal death during delivery in India. Bleeding is technically known as hemorrhaging. Anaemia is one of the major causes of maternal mortality in India. It is noted painfully that after 61 years of independence, India leads iron deficiency anaemia cases in the world and more than 90 per cent of Indian women, adolescent girls and children are anaemic. Everyone is aware that anaemia results in physical weakness, mental shortcomings, low intelligence and increased vulnerability to a number of diseases and causes adverse pregnancy outcomes and even death of expectant mother. The anaemic mothers also bear anaemic children. The Ninth Plan envisaged universal screening for anaemia in pregnant women and appropriate use of IFA (iron folic acid) tablets is also indicated. But just like other plans and policies the programme had not been fully operationalised. In none of the states were services for anaemia included as a component of antenatal care. Data from Rapid Household Survey indicated that even iron folic acid consumption is very low. The target during Tenth Plan was to make every effort to fully operationalise the Ninth Plan strategy for prevention and management of anaemia. But still now it has not faced much success. Only 22.3 per cent of pregnant women consume iron and folic acid supplementation for

90 days and the percentage is less than 10 per cent among the uneducated women compared to 50 per cent among the well educated. Also the disparity between rural and urban areas is significant (18 % and 34.5 % respectively). Eclampsia is one of them, which is a fall out of pregnancy- induced hypertension. This usually happens due to improper antenatal care. Obstructed or prolonged labor occurs when the foetus does not deliver in the anticipated time. This may be due to the wrong position of the foetus, if it is too large a baby or if the pelvis of the mother is narrow. In urban India, obstructed labor is generally not among the primary causes of maternal deaths anymore but in rural India, due to lack of interest in institutional delivery it is still a cause of maternal deaths. Sepsis may arise from infection, unsafe abortions, anaemia and improper care during pregnancy. Intermediate cause include the low social status of women, lack of awareness and knowledge at the household level, inadequate resources to seek care and poor access to quality health care. Other causes are untimely diagnosis and treatment, poor skills and training of care providers and prolonged waiting time at the facility due to lack of trained personnel, equipment and blood. The other prominent dark chapters of our society are the early age of marriage and childbearing, child spacing, family size and fertility patterns, literacy, socio- economic status and the customs and beliefs (Rudra De, 2008).

Health workforces are typically concentrated in large cities while maternal mortality is generally higher in rural areas. Additionally, health care systems are faced with shortages of specialists such as anaesthesiologists, surgeons and obstetricians; a misdistribution of health care infrastructure; and imbalances between the public and private health care sectors. The relationship between lacks of pregnancy related care and maternal death is well recognized. Under the National Rural Health Mission, Accredited Social Health Activist (ASHA), are being seen as a vital link to government programmes on reducing maternal mortality.

Maternal mortality especially the life time risk of dying in pregnancy and child birth shows the largest gap between the rich and poor of all public health/ development statistics. Many of the poorest women or those with least access to safe delivery or family planning services have high fertility and are at high obstetric risk of death from pregnancy or child birth. Rural populations and the poor are at highest risk in general, as they cannot afford or reach the services they needed. Men and women residing in rural

and remote areas can neither be assured that a health outlet is reachable nor that when one is reached it will contain the needed health supplies and services. In Peru, maternal mortality among the poorest women is six times higher than among the richest (Ronsmans et al. 2006).

Most maternal deaths occur in women from tribal/ dalit communities, poor socio-economic status, living in rural, remote regions. Women don't have access to complete continued care from the public health system. Physical, socio- cultural and economic barriers affect access to institutional health services. Women prefer home births and it is a cultural reality. 85 per cent women will have delivered normally. 10- 15 per cent women will develop complications that will need medical interventions. 3-5 per cent women will need surgical interventions (blood/ cesarean etc). 20-25 per cent deaths occur during pregnancy. 40-50 per cent deaths occur during labor and delivery. 25-40 per cent deaths occur after child birth (mostly during the first seven days). It is important to focus attention during pregnancy and also after child birth (Bajpai, 2006).

Levels of maternal mortality are indicative of social injustices between rich and poor people, urban and rural areas and quality of a functioning health care system. Inadequate access to maternity care is one of the causes of maternal mortality. Other indirect causes include poverty and gender inequity. It suggests that it is possible to promote institutional delivery by expanding antenatal care coverage and associated counseling.

The main reasons behind high maternal mortality in India are deliveries not attended by trained personnel. NFHS-II reports that almost only one third (34 per cent) of deliveries in India take place in health care facilities. Women not seeking antenatal care; more than one out of every three women (34 per cent) in India did not receive any antenatal check- up for births in the three years preceding the survey. Postnatal care is grossly deficient.

Despite the Child Marriage Restraint Act 1978, 34 per cent of all women are married below the legal minimum age of marriage (i.e. 18 years) the figure is higher in rural areas (40 per cent) than in the urban areas (18 per cent). Adolescent girls face considerable health risks during pregnancy and child birth. Girls aged 15-19 are twice as likely to die from child birth as women in their twenties; those under age 15 are five

times as likely to die. Teenage pregnancy is great biological hazard for girls in India. One of the reasons is that the reproductive tract is not ready fully for all processes of conception and delivery. Another very important reason is that the mother is herself growing and there is a competition between two children for nutrients which are scarce in the diet. The growth and development of both the mother and her child jeopardizes. The result of such pregnancy is malnourished mother and low weight baby.

Preventing deaths to mothers associated with pregnancy and child birth is one of the greatest challenges before the nation in the 21st century. Despite substantial improvements in life expectancy at birth for the Indian population from 41 years in 1961 to 63 years in 2003, the maternal mortality ratio continues to be unacceptably high at 301 per 100,000 live births. The Millennium Development Goals for 2012 call for the reduction of maternal mortality to 30/100,000 live births, one tenth the current rate.

1.3 Role of institutional delivery in controlling maternal deaths:

Institutional delivery means birth of a baby in a health institute. Health institute includes government dispensary, urban health centre, community health centre, primary health centre, sub centre, rural hospital, private Indian system of medicine (ISM) hospital, government Indian system of medicine (ISM) hospital, private hospital, private clinic etc. Delivery of baby means expulsion or extraction of the baby from mother's body (or uterus). Childbirth (also called labour, birth, partus or parturition) is the culmination of a human pregnancy or gestation period with the delivery of one or more newborn infants from a woman's uterus. Institutional delivery is a part of maternity care. Maternity care is an important variable which is controlled by socio- demographic and economic conditions of the society. Improve of maternal health is fifth Millennium Development Goal. There are two types of place for delivery. One is institutional delivery and another is non- institutional delivery. India accounts for more than one fifth of all maternal deaths related to pregnancy and childbirth worldwide. For tackling this gigantic problem, the programs like RCH and NRHM aim at expanding existing rural health services to include facilities for institutional delivery. In NRHM, Janani Suraksha Yojna (JSY) is providing incentives for institutional delivery. The scheme is modification of National Maternity Benefit Scheme, referral transport etc. and is at present

consideration. The objectives of Janani Suraksha Yojna are to reduce Maternal Mortality Ratio and Infant Mortality Rate and focus on institutional delivery. Around 30 per cent of all women need emergency care during delivery. Only 35 per cent of all deliveries are conducted by the doctor. Only 15 per cent are conducted by the nurse, Auxiliary Nurse Midwife, Lady Health Visitor. In urban areas more than 69 per cent of the deliveries are taken place in institutions but in rural areas only 30 per cent are taken place in institutions (DLHS-2).

The NFHS-III interviewed 230,000 women in the 15-49 age group and men in the 15-54 age groups. It found that 44.5 per cent of the women were married before the age of 18. Jharkhand recorded most of cases (61.2 per cent), followed by Bihar (60.3 per cent). Early marriage is cause of complications during pregnancy. "There are approximately 77,000 maternal deaths per year, which in other words mean one woman dies every seven minutes due to complications related to pregnancy and child birth." said Ministry of State for Health and Family Welfare Panabaka Lakshmi in a written reply in Lok Sabha (March 07, 2007). The Maternal Mortality Ratio (MMR) for India (2001-03) is 301 per 100000 live births. To provide basic facilities in rural areas including those at the time of delivery, the government has launched the National Rural Health Mission (NRHM) in the year 2005 with special emphasis on improving the health status of rural population throughout the country. The mission will operate over the period of seven years from 2005 to 2012 with the goal of achieving reduction of maternal mortality ratio to 100 per 100,000 live births.

Institutional delivery is a critical factor in determining maternal deaths. The NFHS-II indicates that the institutional deliveries are low in the country (33.6 per cent) and very low in rural areas (24.6 per cent). Various measures through have been under implementation in RCH program for promoting institutional deliveries; they still need to be seen for the better results.

Table-1.2: Neonatal, post neonatal, infant mortality rates for the five- year period preceding the survey, by state, India (2005-06)

States	Neonatal mortality (per thousand live births)	Post neonatal mortality (per thousand live births)	Infant mortality (per thousand live births)	Percentage of births delivered in a health facility
Delhi	29.3	10.5	39.8	58.9
Haryana	23.6	18.1	41.7	35.7
Himachal Pradesh	27.3	8.9	36.1	43.0
Jammu and Kashmir	29.8	14.9	44.7	50.2
Punjab	28.0	13.7	41.7	51.3
Rajasthan	43.9	21.4	65.3	29.6
Uttarakhand	27.6	14.3	41.9	32.6
Chhattisgarh	51.1	19.7	70.8	14.3
Madhya Pradesh	44.9	24.7	69.5	26.2
Uttar Pradesh	47.6	25.0	72.7	20.6
Bihar	39.8	21.9	61.7	19.9
Jharkhand	48.6	20.2	68.7	18.3
Orissa	45.4	19.3	64.7	35.6
West Bengal	37.6	10.4	48.0	42.0
Arunachal Pradesh	34.0	26.7	60.7	28.5
Assam	45.5	20.6	66.1	22.4
Manipur	18.7	11.1	29.7	45.9
Meghalaya	23.6	21.0	44.6	29.0
Mizoram	16.3	17.7	34.1	59.8
Nagaland	19.8	18.5	38.3	11.6
Sikkim	19.4	14.3	33.7	47.2
Tripura	33.1	18.3	51.5	46.9
Goa	8.8	6.5	15.3	92.3
Gujarat	33.5	16.2	49.7	52.7
Maharashtra	31.8	5.7	37.5	64.6
Andhra Pradesh	40.3	13.2	53.5	64.4
Karnataka	28.9	14.3	43.2	64.7
Kerala	11.5	3.8	15.3	99.3
Tamil Nadu	19.1	11.2	30.4	87.8
India	39.0	18.0	57.0	38.7

Source: NFHS-III (2005-06)

The promotion of institutional deliveries has been emphasized for reduction of maternal and child health for improving maternal health in the country through RCH program. The cash assistance to pregnant women of BPL families under the Janani Suraksha Yojna is a welcome step for promoting the safe deliveries among the poor. There are economic, cultural and social factors and availability of quality of health services that affect institutional deliveries in the country.

According to Government of India Report (RGI) that estimates, Maternal Mortality Rate for India was 407 per 100,000 live births in the year 2000. The trend has not changed significantly in the last five years. This means more than 100,000 women die each year in India due to pregnancy related problems. The high Maternal Mortality Ratio (MMR) is due to large number of deliveries conducted at home by untrained persons. The existing health system does not adequately meet the needs of pregnant women, particularly for complications of pregnancy and obstetrical emergencies.

Table-1.3: Major policy and program goals in maternal mortality

Year	Document	Goals (per 100,000 live births)
1983	Health policy statement by Government of India	MMR reduction by 200-300 by 1990 and below 200 by the year 2000
2000	National Population Policy	MMR reduction to less than 100 by 2010
2002	National Health Policy	MMR reduction to less than 100 by 2010
2002-07	Tenth five year plan	MMR reduction to less than 200 by 2007 and 100 by 2012

Source: State of maternal health in India; Prof. Dilip Mavalankar (2007)

Today policy making is also largely dictated by concerns of cost, since health care is rapidly becoming a lucrative industry. In the name of being 'cost effective', however, often highly technical, unrealistic and cost intensive solutions may be promoted. Promotion of compulsory 'institutional delivery' for every birth is the only solution for averting maternal deaths. Despite the fact that women may see birth as a private activity to be carried out in the comfort of home or that there are birth attendants in most communities who can be given more training, policy makers insist that all

women should delivers in hospitals. This is despite the knowledge that only 15 per cent of all births leads to complications can happen in the 9th month of pregnancy or up to six weeks after delivery. Policy makers set aside the evident fact that large numbers of women can not afford the travel costs and informal payment for undergoing birth in state run institutions: more importantly, that in large parts of India there are no institutions or referral systems to handle the complicated cases. Knowing all this, policy makers have preferred to promote institutional delivery through incentive payments and other means.

Home birth is a practice which is unevenly spread across the World. With the widespread institutionalization of childbirth since the 1930s the option of a home birth in most developed countries disappeared, even where it was not banned. The system of obstetric care in the Netherlands, where still more than 30 per cent of pregnant women deliver at home, is exceptional among developed countries (Van Alten et al 1989, Treffers et al 1990). On the other hand, in many developing countries, there is great distance between women and the health facilities restrict options and make home birth the only choice.

Institutional delivery helps in improving the condition of maternal deaths and infant deaths. Institutional delivery plays an important role for better treatment of complications during delivery period. Complications during delivery include premature labour, obstructed labour, prolonged labour (more than 12 hours) and excess bleeding during delivery. Health institution has such types of infrastructural facilities which are hard to available in home. The single most critical intervention for safe motherhood is thus to ensure that women receive care during delivery by skilled health personnel- a doctor, nurse, midwife- with the necessary skills to handle normal deliveries safely, to recognize the onset of complication beyond their capacity and to refer the mother for emergency care as needed. All women should have access to basic maternity care through a continum of services offering quality antenatal care, clean and safe delivery and postnatal care for mother and infant with a functioning referral system linking the whole. Around 50 million births in the developing world or about 4 in 10 of all births worldwide are not attended by skilled health personnel. Just ten countries account for slightly more than two- thirds of unattended deliveries worldwide with India alone responsible for more than one quarter.

Promotion of maternal and child health has been one of the most important objectives of the family welfare program in India. In India, antenatal care initiatives began in 1951 with the implementation of the First Five Year Plan (1951-56). However, a lack of health infrastructure, and a focus on family planning using a clinic based approach limited the benefits to women. Even in the Second Five Year Plan period, it was clarified that the 'family planning service is likely to succeed if the clinics are associated with maternity and child health work or with centers which provide medical aid and welfare services'. In the Third Five Year Plan (1961-66), an extension approach to family planning was adopted with recruitment of auxiliary nurse midwives (ANMs) and Health Assistants. It provided women access to some elements of antenatal care. During the Fifth Five Year Plan (1974-79) maternal and child health services (MCH) were integrated with family planning services and a new program entitled 'family welfare' was introduced. The family planning program was renamed as the family welfare program to make it more acceptable and to denote that it had a wider base, so that it could also include various measure of family welfare for the improvement of the quality of human life. During 1992-93, an integrated and maternal and child health (MCH) and immunization program was initiated. This program is called the child survival and safe motherhood program and is assisted by World Bank and United Nations Children's Fund (UNICEF). Child survival and safe motherhood (CSSM) encompasses in itself the aspects of immunization for pregnant women, prevention and treatment of anaemia, antenatal care, delivery by trained personnel and promotion of institutional delivery. The impact of the Child Survival and Safe Motherhood (CSSM) Program has started becoming evident in many parts of the country.

The Reproductive and Child Health (RCH) Approach was adopted in 1995, following the International Conference on Population and Development (ICPD) Program of Action, 1994. The Reproductive and Child Health Program (RCH) was launched in October 1997 (Ninth Five Year Plan, 1997-2002). The Reproductive and Child Health Program (RCH) incorporates the components covered under the child survival and safe motherhood program and includes an additional component relating to reproductive tract infection and sexually transmitted infections. In order to improve maternal health at the community level a cadre of community level skilled birth attendant who will attend to the

pregnant women in the community is being considered. The Government of India in the early 1990s set a goal of achieving maternal mortality rate of 2 per 1000 births. The need for bringing down maternal mortality rate significantly and improving maternal health in general has been strongly stressed in the National Population Policy 2000. The National Population Policy (NPP) reiterates the Government's commitment to the safe motherhood program within the wider context of reproductive health. Among the national socio-demographic goals for 2010 specified by the policy, several goals pertain to safe motherhood, 80 percent of all deliveries should take place in institutions by 2010, hundred percent deliveries should be attended by trained personnel and the maternal mortality ratio should be reduced to a level below 100 per 100,000 live births. Empowering women for improved health and nutrition is one of the twelve strategic themes identified in the policy to be pursued either as stand- alone program or as inter-sectoral programmes. This policy recommends a holistic strategy for bringing about total inter-sectoral coordination at the grass root level and involving the non-governmental organization (NGOs), Civil Societies, Panchayati Raj Institutions and women's group in bringing down maternal mortality ratio and infant mortality rate. To promote institutional deliveries, provision has been made under the current Reproductive and Child Health Program (RCH) to give additional honorarium to the staff to encourage round the clock delivery services at primary health centres (PHCs) and community health centres (CHCs). This is to ensure that at least one medical officer, nurse and cleaner is available beyond normal working hours. Under this scheme Rs. 1168.88 lakhs have been released to twenty one states based on the proposals received from them.

Government of India has recently announced a National Rural Health Mission (NRHM) with a clear goal of addressing the health needs of rural population especially vulnerable sections of the society. Such community level links workers maybe called as Accredited Social Health Activists (ASHAs). ASHAs will act as a link among beneficiary at all village level, anganwadi worker and auxiliary nurse midwife (ANM). The scheme is under consideration. Initially, it is planned to give this helper (ASHA) to all the villages of EAG states, Assam and Jammu & Kashmir. They will help and guide women to assess the health facilities for antenatal care, institutional delivery, post- natal care and counseling on nutrition and family planning services.

1.4 Effect of promotion of institutional delivery:

This national qualitative study seeks to understand and document women's experiences with institutional delivery or attempted institutional delivery across nine states of India in order to find out the effect of the government's policies that promote delivery in institutions are having on improving maternal health. The experiences of women who have reached an institution during labor for their most recent delivery are being documented through in depth interviews with women and or their family members in each state. The study will document women's experiences in rural and urban areas, as well as across lower and better performing states. The multi- centric study is being conducted cooperation with partner's NGOs in the nine states of Bihar, Delhi, Gujarat, Jharkhand, Karnataka, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal using their contacts with women from diverse communities. We believe that detailed accounts of women's experiences receiving or attempting to receive institutional delivery care will provide us with a better understanding of the problems women are currently facing when try to deliver in institutions and will allow us to come up with recommendations to this situation. As a result of this study, we hope to initiate a national advocacy effort aimed at informing the government about the on the ground realities of delivery in institutions and encouraging government officials look at the whole continum of pregnancy care rather than simply focusing on institutional delivery as the solution to India's high rate of maternal mortality.

In September 2007, UNICEF and the Government of Madhya Pradesh set up a call center in the Guna district hospital that exclusively provide 24×7 emergency transport for pregnant women, new born and sick children with aim to: link communities to the facilities of hospitals; reduce maternal mortality and increase the number of institutional deliveries. The state government has named it the Janani Express Yojana and provides this service free of charge. Guna has witnessed a spurt in the number of institutional deliveries after this unique facility was introduced in April 2007, the number of institutional deliveries in the district was 1500 which rose to 2258 by April 2008 eight months after the call centre started functioning. In June 2008, the number of institutional deliveries was 2476 and rose to 2972 in July 2008. The latest available data of October

2008 claims 2920 or 96 per cent of pregnant women underwent institutional deliveries. Result shows that maternal deaths (Guna district, Madhya Pradesh) have come down on bottom (UNICEF, 2008).

Close to two- thirds of all deliveries in India still take place at home. The proportion varies from less than 35 per cent in urban areas to more than 75 per cent in rural areas. In states like Uttar Pradesh and Bihar, only about 15 per cent of children are born in medical institutions. There is huge difference in the situation and prospectus of an urban middle class woman and a woman from a poor family in a village in Uttar Pradesh or Bihar. The urban women are probably well nourished, have been going to a doctor regularly for check- ups and have been given anti- tetanus injections. She will deliver in a clean place with a trained nurse in attendance and a doctor with in reach in case of emergencies. For her, delivering at home is a matter of a choice. The rural woman, on the other hand, has a high chance of being anaemic and underweight of not having seen a doctor and not being protected from tetanus. She would not have access to a doctor or hospital in her own village. Institutional delivery rates, major states ranged from 22 to 100 per cent with an all India average of 41 per cent in 2005-06 (IIPS 2007).

A stronger program is to increase institutional delivery in low performing states and in communities having high Maternal Mortality Ratio (MMR) can, however, make a difference. States having high percentage of institutional deliveries generally have lower maternal mortality and vice versa.

1.5 Role of socio- economic development for promotion of institutional delivery:

The socio- economic development plays an important role in utilization of health services and institutional health services. Higher levels of education, high living standard, high age at marriage and exposure to mass media are important phenomena of socio-economic development in context of institutional delivery. Mother's level of education has a large positive effect on the odds of institutional delivery. Mother's age also has a strong positive effect, but child's birth order has a strong negative effect in most cases. Together, the opposite effects of mother's age and child's birth order indicate that women who delay childbearing are more likely to deliver in a medical institution. The effects of religion are mixed. In some cases the odds of institutional delivery are higher for

Muslims than for Hindus, but in other cases the direction of the effect is reversed. The odds of institutional delivery are lower for scheduled caste and scheduled tribe mothers than for other caste mothers. They are also lower for working mothers than for non-working mothers. The odds of institutional delivery are higher for mothers who are regularly exposed to the electronic mass media than mothers who are not regularly exposed and higher for mothers in households with a high standard of living than for mothers in households with a low standard of living. The effect of available of all-weather roads on institutional delivery is usually positive. The receiving one or more antenatal check- ups is the strongest predictor of institutional delivery.

Some hospitals have made an effort by installing a home- like birth room and this was found to increase maternal satisfaction and institutional delivery as well as reducing the desire for a different setting for the next birth, but randomly trials found no effect on the use of epidural analgesia, forceps delivery and caesarean section (klein et al 1984, Chapman et al 1986).

The positive relationship between economic background of women with both level of institutional delivery and expenditure on delivery reflects the inequalities in access to health care in the population, which could be also minimized by strengthening the public sector, where cost of delivery is relatively very low (Dasgupta, 2006). The persistence of a high maternal mortality ratio (MMR) despite half a century of efforts to bring it down indicates that somehow we haven't been able to establish appropriate maternal health services especially in the rural areas.

1.6 Objectives of this study:

To answer some of such questions, the study sets the following objectives by selecting the state of Bihar where MMR is highest, in Andhra Pradesh where MMR is the lowest-

I. To build up the profile of the health care facilities related to child and mother care facilities with special emphasis on institutional delivery in Bihar and Andhra Pradesh.

II. To compare and contrast the pattern of institutional delivery in Bihar and Andhra Pradesh.

1.7 Hypotheses:

Based on the conceptual framework, the following hypotheses have been framed to be empirically tested:

1. Women belonging to urban area, upper caste with high level of education and high standard of living are more likely to go for delivery in medical institute as compared with women residing in rural area, lower caste with low level of education and low standard of living.
2. Women with high antenatal care and low birth order are more likely to go for delivery in health institute as compared with women having low antenatal care and high birth order.

1.8 Organization of Dissertation:

This dissertation has five chapters. **First** chapter is introduction. In introduction chapter, we discuss present situation of maternal death in India, causes of maternal deaths, role of institutional delivery in controlling maternal deaths, effect of promotion of institutional delivery, role of socio- economic development for promotion of institutional delivery and objectives of this research work. **Second** chapter dealt with review of literature. In this chapter, we discuss relationship of standard of living, religion, antenatal care, mother's education, husband's education, birth order, mass media, place of residence, caste or tribe and age at marriage with place of delivery through literature work. **Third** chapter is related with area, data and methodology. In this chapter, we discuss study area (Bihar and Andhra Pradesh), data source (NFHS-III) and methodology (univariate, cross tabulation and binary logistic regression). **Fourth** chapter is analysis. In this chapter, we give simple picture of background variables(standard of living, religion, antenatal care, mother's education, husband's education, birth order, mass media, place of residence, caste or tribe and age at marriage) and then we analyzed gross effect of selected socio- economic variables (standard of living, religion, antenatal care, mother's education, husband's education, birth order, mass media, place of residence, caste or tribe and age at marriage) on place of delivery in Bihar and Andhra Pradesh. In binary logistic regression, we analyzed net effect of selected socio- economic variables (standard of

living, religion, antenatal care, mother's education, husband's education, birth order, mass media, place of residence, caste or tribe and age at marriage) on place of delivery in Bihar and Andhra Pradesh. **Fifth** chapter is summary and conclusion. In this chapter, we summarize the dissertation and give suggestions for improvement of institutional delivery in Bihar.

CHAPTER- TWO
REVIEW OF LITERATURE

Chapter-2

Review of literature

2.1 Mother's education:

The education of mother played a vital role in making the decision about the place of delivery (Pandey et al. 2007). Mother's education has a strong positive effect on institutional deliveries (NFHS-2). Woman's education is a major factor affecting utilization of maternal health services in both north and south India (Govindasamy and Ramesh, 1997). Mother's age and education have strong effect on the likelihood of institutional delivery (Sugathan et al. 2001). Education is generally assumed to have far reaching benefits. At the individual level, better education is associated with better health, more economic opportunities and greater autonomy, especially for women (Federici et al. 1993; Jejeebhoy, 1995). At the aggregate level, the educational composition of the population has been long considered a key factor of economic institutional and social development (Benevot 1989; and Bellew et al. 1992; Hadden and Lodon, 1996).

Higher education levels influence the use of health services in several ways such as antenatal check- ups, institutional deliveries, consulting the doctors, contraceptive use and sexual health care. This study suggest that a maximum number of women from lower socio- economic category preferred home deliveries and few of them got antenatal check-up. The expenditure of institutional delivery is out of reach for lower and poor economic status families. This study highlighted that those women who are better educated have maximally availed of delivery care services when compared to less educated and illiterate women. Women with only primary and middle school education are less likely to see a professional in connection with their pregnancy and delivery. Attainment of education has a major influence on utilization of maternal health care services. It is observed that women: young and old with lower level of education belonging to households having lower standard of living, minimum exposure to media, living in villages with hospital far

away from home are less likely to receive recommended doses of tetanus injection during pregnancy (Partha De, 2008).

Maternal education effects the choice between home and public/ private deliveries. Education leads to better health awareness and this may sensitize the family to the quality of health care provided at various facilities (Amardeep et al. 2008). Education has emerged as an important determinant of utilization of public sector hospitals in reference to private sector hospitals (Murthy et al. 2007). Women's education is the only variable that has a consistently large, positive adjusted effect on use of private sector family planning services in both urban and rural areas (Nair et al. 1999). Cross- country comparisons using large data sets, such as World Fertility Survey and the Demographic and Health Surveys have shown that education in general and female education in particular extent a very strong influence in reducing child morbidity and mortality (Boerma et al. 1990; Bicego and Boerma 1993; Caldwell and Caldwell 1990; Hobcraft, McDonald and Rutstein 1985; Murthi, Guio and Dreze 1995).

2.2 Birth order:

Birth order affects the choice between home and public or private deliveries (Amardeep et al. 2008). Increase in the birth order has a negative in the maternal service utilization, NFHS-II in Andhra Pradesh, 53 per cent of first order births but only 24 per cent of fourth or higher order births took place in medical institutions. Child birth order has strong effect on the likelihood of institutional delivery. The old mothers are less likely to give birth in a medical institution than young mothers. It shows that first order births to rural mothers are more likely to take place in a medical institution than second and higher order births (Sugathan et al. 2001).

2.3 Standard of living:

Disparities in utilization of delivery care exist between rich and poor individual as well as rich and poor countries. Household standard of living has a substantial effect on institutional delivery. Institutional delivery is positively associated with household's standard of living. The results suggest that it may be possible to increase institutional deliveries by promoting antenatal check- ups (Sugathan et al. 2001). Higher income

group people give more emphasis on antenatal check ups (health care services) than lower income groups. In terms of delivery assistance, antenatal check up and place of delivery, there appears to be a big gap according to the women's standard of living. Women from poor sections of the society are less likely to avail of maternal health care services than rich women. The reason might be that the cost of delivery care at private or public medical facilities is high. Poor families don't find themselves in a position to be able to bear the cost of delivery care services. Even if they wish to avail the public sector medical facilities, they have to bear the cost of medicines and are expected to give gift in kind or cash to the attending doctors and other paramedical staffs (Abdul et al. 2006).

Mothers belonging to household with a low standard of living are less likely to give birth in a medical institution than mothers belonging to households with a medium or high standard of living (Sugathan et al. 2001). Higher standard of living affects the choice between home and public or private deliveries (Amardeep et al. 2008). Economic status was identified as one of the determining factors of preference for non- institutional deliveries (Gupta 1999). Standard of living also influences home deliveries. Respondents with low and moderate standard of living have low institutional deliveries than respondent with high standard of living. High income people have surplus money for input health facilities. They are trying to get better health facilities (Murthy et al. 2007). The study indicates that educated women with high standard of living have an emphasized role in the practice of more maternal health care (International Journal for Quality in Health Care, 2007).

Moncler and Foelix (1990) in their study of rural health services found that increment in household income also increases the probability of service utilization at primary health centres. In a study of maternal health care utilization in Jordan, Obermeyer and Potter (1991) shows that a high standard of living and high educational attainment are positively associated with intensity of utilization of prenatal care. Similarly, Mondal (1997) in the study of utilization of antenatal care services in Rajasthan observed that woman's standard of living is positively associated with service utilization.

2.4 Age at marriage:

The age at marriage is found to be the proximate determinants of teen pregnancies in all the states as proved by path analysis, but the average age at marriage is relatively high in southern states compared to northern states in India. Age at marriage is influenced by socio- cultural and economic variables, influencing the occurrence of teen pregnancies. Raising age at marriage will be the most successful measure to reduce teen and unintended pregnancies in northern states and it will help women reduce the reproductive risk and thus the prolongation of child bearing through effecting use of family planning methods (Ramachandran et al. 2005).

Delaying marriage positively influenced girl's lives in many ways. It was associated with increased involvement in marriage related planning and institutional delivery for first birth (Santhya et al. 2008). The Child Marriage Restraint Act 1978 of India prohibits marriage of girls below the age of 18. Early marriage and pregnancy soon after marriage have been serious problems in many countries posing complications to the health of mother. In India, cultural norms and values promote early marriage and pregnancy, it is generally believed as a way of gaining status within the peer group and a link between maternity and feminine identity (Mondol, 2003).

If the age at marriage is increased, especially in those societies where age at marriage is low, it could influence maternal mortality, not only reducing fertility but also by reducing the chance that a woman's pelvis will be immature at the time of her first birth, a condition that is associated with obstructed labor (Mc Carthy and Maine, 1992). According to Pallikadavath et al. (2004), antenatal check- ups through visit to health centres were more likely among women who married at the age of 19 or above compared to women married at a younger age.

2.5 Husband's education:

India is primarily a patriarchal society. Husband is the ultimate decision maker in most families including decisions on maternal health care. As the reproductive behavior of a woman is usually determined by her husband and husband's education also plays a significant role in influencing the reproductive health of his wife (Khan et al., 1997).

High level of husband's education increases the likelihood of health service (American Journal of Public Health, 2006). Pallikadavath et al. (2004) found that use of antenatal check- ups through visits to health centres increases with husband's education.

2.6 Mass media:

Mass media has a greater influence on the change in behavior. Radio listening promotes awareness about health facilities. With efflux of time television has promoted health awareness (Murthy, 2007). Institutional delivery is higher for mothers who are regularly exposed to the electronic mass media than mothers who are not regularly exposed (NFHS-II, 1998-99). Institutional delivery is positively associated with mother's education and exposure to mass media. Rural mothers who are regularly exposed to electronic mass media are several times more likely to give birth in a medical institution than mothers not so exposed (Sugathan, 2001).

Media exposure effect the choice between home and public/ private facilities (deliveries) (Amardeep et al. 2008). As respondent belong to urban areas more exposure to mass media may promote utilization of better health facilities (Murthy et al. 2007).

2.7 Place of residence:

Rural mothers belonging to scheduled caste or scheduled tribe are much less likely to give birth in a medical institution than mothers not belonging to a scheduled caste or scheduled tribe (NFHS-II, 1998-99). It is not surprising that a maximum number of women in rural areas give birth at home without professional help and antenatal check up. The existing modern medical facilities in rural set up are much less, very far off from the remote villages and are neither properly functioning nor providing adequate maternal health services during emergency. Urban residence has proved to be a strong predictor of women's likelihood of using maternal health services (Abdul et al. 2006).

In Bihar and Andhra Pradesh, the proportions receiving each of the antenatal and delivery care services are higher in urban areas than in rural areas. Among rural mothers, literate mothers are more likely to give birth in a medical institution than illiterate mothers (Sugathan et al. 2001). Women in rural areas and urban slums in developing

countries have less access to reproductive health services than do middle and upper income urban women (Murthy et al. 2007).

Poor access to health services even in urban area despite proximity to hospitals is a result of many factors including weak demand, minimal outreach services, weak community provider linkages and timings that often do not suit the daily wage earning urban poor (Pandey, 2007).

2.8 Religion:

Religion is a very fluctuating determinant and has regional variations with institutional delivery (International Journal for Quality in Health Care, 2007). Traditional beliefs about childbirth, coupled with conceptions and fears of medical institutions, have led many women to maintain reliance on home births in India (Americans Journal of Public Health, 2006). Religion effect the choice between home and public/ private deliveries (Amardeep et al. 2008).

Muslim mothers are more likely than Hindu mothers to give birth in a medical institution in Andhra Pradesh and Gujarat but Muslim mothers are much less likely than Hindu mothers to do so in Bihar and Rajasthan (NFHS-II, 1998-99). Non- institutional deliveries among Muslim women are higher than Hindu women in Bihar and Rajasthan (Partha De, 2008). Hindu mothers are somewhat more likely than Muslim mothers to deliver in a medical institution in Bihar, but somewhat less likely to do so in Andhra Pradesh (Sugathan, 2001).

2.9 Caste or tribe:

The caste system has been at the core of social organization in India for centuries. The low castes suffer disadvantages in various spheres of life including health. To better understand the inequities in health, it is necessary to conceive of caste and class as both independent and related. There are no differences between Scheduled Castes or Tribes and Other Backward Castes, but rather that they can be explained by differences in social and economic positions occupied by these groups (Dommaraju, 2008). Non- institutional deliveries among Scheduled Caste or Tribe women are higher than upper caste women (Partha De, 2008).

In India, rural mother belonging to Scheduled Castes or Tribes are less likely to give birth in a medical institution than mothers not belonging to a Scheduled Caste or Tribe (Sugathan, 2001). It shows that utilization of home deliveries has declined over a period of time. The decline has been more prominent in Other Backward Caste (OBC) than Scheduled Caste or Tribe (Murthy et al. 2007). The women of Scheduled Caste (SC) and Scheduled Tribe (ST) had significantly lower proportions of institutional deliveries than women who belonged to other groups in Nainital (Pandey, 2007).

Grover et al. (2001), in their RCH survey of Faridabad (Haryana) have shown that the higher caste women have received the antenatal care, tetanus toxoid and iron folic acid packages more frequently than women of Scheduled Caste or Tribe and Other Backward Caste. Similar finding can be shown in a study conducted by Pallikadavath et al. (2004). According to Pallikadavath et al., with regard to caste, members of Other Backward Caste had a higher usage of antenatal care compared with Scheduled Caste or Tribe.

2.10 Place of delivery:

Place of delivery is an important aspect for reproductive health care. The place of delivery often determines the quality of health care received by the mother and infant (Murthy et al. 2007). The reasons for home deliveries included lack of transportation to the hospital and insufficient time to reach the hospital (Jorge, Gotlieb and De Andrade 1997). It is well established that giving birth in a health institute promotes child survival and reduces the risk of maternal mortality (Tsui et al. 1997).

2.11 Antenatal care:

Antenatal care covers at least five basic services- pregnancy monitoring, tetanus toxoid vaccine, Iron and Folic Acid tablets (IFA) and nutrition or safe delivery counseling. These can help women go through the pregnancy safely and ensure that the new born is in good health. The impact of antenatal care on the health and survival of the mother and the child can't be overemphasized. States which reach out good antenatal care show a marked decline in infant mortality.

Antenatal care is a pivotal factor for the safe motherhood. The primary aim of antenatal care is to achieve healthy mother and a healthy baby at the end of pregnancy (Roumi Deb, 2008). Receiving one or more antenatal check- ups is the strongest predictor of institutional delivery (NFHS-II, 1998-99). Antenatal care is hypothesized to have a positive effect on the likelihood of institutional delivery, in as much as women receiving antenatal care come in contact with health care providers who are likely to encourage them to give birth in a medical facility. Mothers who receive antenatal check-ups are two to five times more likely to give birth in a medical institution than mothers, who did not receive antenatal check- ups (Sugathan et al. 2001).

Only two- thirds of women receive any antenatal care, have the recommended more than three antenatal visits. The share receiving 3+ antenatal care among women who have any antenatal care is nearly unchanged since NFHS-II. 56 per cent of women who receive any ANC, received ANC in the first trimester. Receiving of at least two doses of tetanus injection during pregnancy, consumption of iron folic acid tablets, more than two antenatal check ups, more institutional delivery are important determinants to reduce the death of new born (Partha De, 2008). .

Having received two or more tetanus toxoid injection during pregnancy also has a positive effect on institutional delivery, but this effect is much smaller than the effect of having had an antenatal check up. The principal mechanism by which the two antenatal care variables affect institutional delivery is presumably that the health professionals who provide the antenatal care tend to encourage mothers to deliver in a medical institution (Sugathan et al. 2001). Number of antenatal visits and location affect the choice between home and public/ private deliveries (Amardeep et al. 2008). Use of antenatal care services has a significant and positive effect on their place of delivery (Kavitha and Audinarayana, 1997). Antenatal check- up is a mean to encourage women by the health professionals to deliver in an institution. There is positive relationship between the percentage of antenatal check- up and the percentage of institutional deliveries (International Journal for Quality in Health Care, 2007).

The effect of antenatal care on institutional delivery is larger in south India than in the north India and the predicted percentages receiving institutional delivery is higher in

south India than in north India. The analysis indicates that improvements in antenatal coverage are an effective mean for increasing institutional delivery (Mishra, 2008).

The goal of safe motherhood aims at maintaining the good health of the mother during pregnancy, which will enable her to produce healthy, normal infant and remain herself healthy (Bourn, 1972). Utilization of health services is effected by access and demand for services, which is determined largely by socio- economic factors, personnel health beliefs and perception of illness. A number of studies have assessed the role of socio- economic and demographic factors in influencing demand for utilization of maternal and child health services (Kanitkar and Sinha 1989; Elo 1992; Swenson et al. 1993; Abdalla 1993; Govindasamy 2000; Khan et al. 1994; Barlow and Diop 1995; Ahmed and Mosley 1997; Regmi and Manandhar 1997; Govindasamy and Ramesh 1997; Das et al. 2001).

CHAPTER- THREE

AREA, DATA AND METHODOLOGY

Chapter-3

AREA, DATA AND METHODOLOGY

This chapter describes about data source which is used in this research work, areas of study and methodology of this work.

3.1 Nature and source of data:

The data source of this study is National Family Health Survey-III (NFHS-III). The National Family Health Surveys (NFHS) are important component of the project to strengthen the survey research capabilities of the population research centers in India, launched by the ministry of health and family welfare, New Delhi, in 1991. The National Family Health Surveys (NFHS) are nationwide surveys conducted with a representative sample of households throughout the country. The ministry of health and family welfare (MOHFW), GOI, initiated the NFHS surveys to provide high quality data on population and health indicators. The three NFHS surveys are conducted to date are a major landmark in the development of a demographic and health data base for India. An important objective of the National Family Health Surveys (NFHS) has been to provide national and state estimates of fertility, infant and child mortality, family planning, reproductive and child health, nutrition of women and children, the quality of health and family welfare services and socio- economic conditions. The National Family Health Surveys (NFHS) use standardized questionnaires, sample designs and field procedures to collect data. The information is provided by National Family Health Survey (NFHS) assists policy makers and program administrators in planning and implementing population, health and nutrition program. The ministry of health and family welfare (MOHFW) designated the International Institute for Population Sciences (IIPS), Mumbai, as the nodal agency for each of the three rounds of NFHS.

The country's first NFHS-I has conducted in 1992-93. The NFHS-I covered 24 states and the National Capital Territory of Delhi, which comprises 99 per cent of the total population of India. In all, 89,777 ever married women age 13-49 and 88,562 households were covered, using uniform questionnaires, sample designs and field procedures. The data collection was carried out on a state by state basis from April 1992

to September 1993. The final state level reports were prepared jointly by representatives from the concerned population research centre for each state, faculty members from IIPS and demographers from the East- West Centre/Macro International. The contents and tabulation plan for this national report were discussed and finalized at workshop held at IIPS on 19-20 September 1994. The East- West Centre, Hawaii, USA, and Macro International, Maryland, USA, provided technical assistance for NFHS-I. Funding was provided by the United States Agency for International Development (USAID).

The data collection under the NFHS was carried out in three phases in 1992 and 1993. Andhra Pradesh, Himachal Pradesh, Madhya Pradesh, Tamil Nadu and West Bengal were covered during the first phase. Assam, Goa, Haryana, Karnataka, Rajasthan and Uttar Pradesh were covered during the second phase. Arunachal Pradesh, Bihar, Gujarat, Jammu region of the Jammu and Kashmir, Manipur and Meghalaya, Mizoram, Nagaland and Orissa, Punjab, Tripura and the National Capital Territory of Delhi were covered during the third phase. The first National Family Health Survey (NFHS-I) was Published in August 1995.

The second National Family Health Surveys (NFHS-II) conducted in 1998-99, was an important step in strengthening the database for implementation of the reproductive and child health approach adopted by India after the ICPD in 1994 in Cairo. In addition to the population and health components covered in NFHS-I, NFHS-II collected information on the quality of health and family welfare services, women's reproductive health problems, domestic violence, the status of women, education and the standard of living. Height and weight measurements were extended to cover ever-married women. Ever married women and their children below three years of age had their hemoglobin levels measured to provide the first national estimates of the prevalence of anemia. In Delhi and Mumbai, a test was also done to measure the lead content in the blood of children below the age of three. A test was also conducted for the iodine content of household cooking salt.

The NFHS-II covered a representative sample of over 91000 ever married women age 15-49 years from 26 states that comprises more than 99 per cent of India's population. The data collection was carried out in two phases, starting in November 1998 and March 1999. The survey provides state- level estimates of demographic and health

parameters as well as data on various socio- economic and programmatic factors that are critical for bringing about desired changes in India's demographic and health situation. The survey used uniform questionnaires, sample designs and field procedures to facilitate comparability of the data and to achieve a high level of data quality. The NFHS-II survey was carried out in two phases. Ten states were surveyed in the first phase which began in November 1998 and the remaining states were surveyed in the second phase which began in March 1999. The NFHS-II was conducted with financial support from United States Agency for International Development (USAID), with additional funding from UNICEF. The second National Family Health Survey (NFHS-II) was published in October 2000.

The third National Family Health Survey was conducted in 2005-06. In addition to the indicators covered in NFHS-II, NFHS-III provides information on several new and emerging issues such as perinatal mortality, male involvement in the use of health and family welfare services, adolescent reproductive health, high risk sexual behavior, family life sexual education, safe injections and knowledge about tuberculosis. A major new component of NFHS-III is blood testing for HIV prevalence and behavior- related information among adult men and women. In addition to interviewing ever- married women age 15-49, NFHS-III included never married women age 15-49 and both ever-married and never married men age 15-54 as eligible respondents. NFHS-III covered all 29 states in India, which comprise more than 99 per cent of India's population. NFHS-III collected information from a nationally representative sample of 109,041 households, 124,385 women age 15-49 and 74,369 men age 15-54. Fieldwork for National Family Health Survey-III was conducted in two phases from November 2005 to August 2006. The initial target sample size was 4000 completed interviews with ever married women in states with a 2001 population of more than 30 million, 3000 completed interviews with ever married women in states with 2001 population between 5 and 30 million, and 1500 completed interviews with ever married women in states with a population of less than 5 million. Funding for National Family Health Survey-III was provided by the United States Agency for International Development (USAID), the United Kingdom Department for International Development (DFID), the Bill and Melinda Gates Foundation, UNICEF, UNFPA and the Government of India. The third National Family Health Surveys (NFHS-III) was published in September 2007.

3.2 Area of study:

The main purpose of this study is to do comparative study of determinants of institutional delivery between developed state and developing state in India. We chose Bihar state as a developing state because it is one of the most backward states in India in the context of social and economic development. Almost 58 per cent people of Bihar are below the age of 25, which is the highest in India. It shows Bihar has good future in term of youth population. The total literacy rate of Bihar is 47 per cent (59.7 per cent for males and 33.1 per cent for females); which is the lowest in India. Bihar has very high maternal deaths in India. That's why we chose Bihar. We chose Andhra Pradesh because its size of population is very close to Bihar. In the decade of 1961 and 1971, the social development of Andhra Pradesh is same as Bihar. That time, maternal death was very high in Andhra Pradesh. In present, maternal death is low in Andhra Pradesh as comparison to other northern states in India (NFHS-III). In Bihar, literacy rate and sex ratio are 21.95 per cent and 1005 females per 1000 males respectively according to Census 1961. In Andhra Pradesh, literacy rate and sex ratio are 21.19 per cent and 981 females per 1000 males respectively (Census 1961). According to Census 1971, literacy rate and sex ratio are 23.17 per cent and 957 females per 1000 males in Bihar. According to Census 1971, literacy rate and sex ratio are 24.57 per cent and 977 females per 1000 males in Andhra Pradesh. In that time Andhra Pradesh and Bihar, both states are developing state in India. Now Andhra Pradesh is developed state in India. We want to know which socio-economic factors play important role in development (institutional delivery) of Andhra Pradesh. On this basis we can give suggestion for improvement of institutional delivery in Bihar. So we chose Andhra Pradesh and Bihar for comparative study.

Bihar is the 12^{th} largest state in terms of geographical size. The plain of Bihar is divided into two unequal halves by the river Ganga which flows through the middle from west to east. Bihar is mainly a vast stretch of very fertile flat land. It is drained by the Ganga River, including northern tributaries Gandak and Koshi originating in the Nepal Himalayas and the Baghmati in the Kathmandu valley that regularly flood parts of the Bihar plain.

3.1: Location map of Bihar (map not in scale)

3.2: Location map of Andhra Pradesh (map not in scale)

The total area covered by the state of Bihar is 94,163 sq. km. Bihar is the third most populated state of India with total population of 8,29,98,509. Nearly 90 per cent of population of Bihar lives in rural areas. Hinduism is practiced by 83.2 per cent of the population and forms the majority religion in the state. Islam is practiced by 16.5 per cent of the population and other religions less than 0.5 per cent. Maternal mortality rate of Bihar is 371 per 100,000 live births (RCH-DLHS, 2002-04). The 14.6 percentage of deliveries conducted in a medical institution according to National Family Health Survey-II (1998-99). The 25.3 per cent of the delivered women has institutional delivery according to National Family Health Survey-III (2005-06). The economy of Bihar is agriculture based. Bihar has the lowest GDP per capita in India.

Andhra Pradesh is a state situated on eastern coast of India. It is India's fourth largest state by area and fifth largest state by population. The state has the second longest coastline (972 km) among all the states in India. Andhra Pradesh is historically called the "Rice Bowl of India". It is currently second largest producer of rice in India after West Bengal. Two major rivers, the Godavari and the Krishna run across the state. Andhra Pradesh has 23 districts. Telugu is the official language of the state, spoken by 83.75 per cent of the population. Telugu is the second most spoken language in India. The main ethnic group of Andhra Pradesh is the Telugu people who primarily belong to the Dravidian society. Agriculture has been the chief source of income for the state's economy. Four important rivers of India, the Godavari, Krishna, Penna and Thungabhadra flow through the state providing irrigation, rice, sugarcane, cotton, chilli pepper, mango and tobacco are the local crops. Andhra Pradesh is a mineral rich state. The state has about one third of India's limestone reserves. The Krishna- Godavari basin has big reserves of natural gas and petroleum. The state has also huge amount of coal reserves. The state ranks first nationwide in hydro electricity generation with national market share of over 11 per cent. According to 2001 census, Andhra Pradesh has an overall literacy rate of 60.5 per cent while the male literacy rate is at 70.3 per cent; the female literacy rate is only at 50.4 per cent.

The state of Andhra Pradesh has an area of 275,045 sq km and a population of 76.21 million. There are twenty three districts, 1127 blocks and 28,123 villages in Andhra Pradesh. The state has population density of 277 per sq km. The total fertility rate of the state is 1.8 children per women. The maternal mortality ratio is 195 per 100,000 live births (RCH-DLHS 2002-04). The 49.8 percentage of deliveries conducted in a medical institution according to National Family Health Survey-II (1998-99) in Andhra Pradesh. The 75.8 per cent of women has institutional delivery according to National Family Health Survey-III (2005-06) in Andhra Pradesh.

3.3 Measurement of variables:

There are seven files in NFHS-III (2005-06). The file names are as follow- All India Birth, All India Children, All India Couples, All India Household, All India Individual, All India Men, All India Women. The birth file of National Family Health Survey-III (2005-06) is used in this research work. In Birth file, there are total 2,56,782 women (delivered women and not delivered women) in India, among them, there are total 51,484 delivered women (institutional delivery and non- institutional delivery). There are total 10,448 women (delivered women and not delivered women) in Bihar, among them, there are total 2,313 delivered women (institutional delivery and non- institutional delivery). There are total 13,669 women (delivered women and not delivered women) in Andhra Pradesh, among them, there are total 2,287 delivered women (institutional delivery and non- institutional delivery). The National Family Health Survey-III (2005-06) was designed to provide estimates of important indicators on family welfare, maternal and child health and nutrition. In addition, National Family Health Survey-III (2005-06) provides information on several new and emerging issues, including family life education, safe injections, perinatal mortality, adolescent reproductive health, high risk sexual behavior, tuberculosis and malaria. The list of variables is as below, which are used in this research work-

Name of variables	**Code**
(1) Highest educational level	V106
(2) Birth order	BORD
(3) Standard of living index	SSLI

(4) Age at marriage (include married gauna performed)	S310c
(5) Partner's educational level	V701
(6) Exposure to mass media	
Has radio	V120
Has television	V121
(7) Type of place of residence	V025
(8) Religion	V130
(9) Type of caste or tribe of household head	S46
(10) Place of delivery	M15
(11) Days iron tablets or syrup taken	M46
(12) Tetanus injection taken before birth	M1
(13) Antenatal visit for pregnancy	M14
(14) Antenatal care (M46 +M1+ M14)	

3.4 Methodology:

In this study, we mainly use the following quantitative research methods-

(a) Univariate analysis

(b) Bivariate analysis

(c) Logistic regression analysis

The purpose of using Univariate analysis is to show percentage distribution of following variables- birth order, standard of living index, age at marriage (included gauna performed), partner's educational level, exposure to mass media, place of residence, religion, type of caste or tribe, days iron tablets or syrup taken, tetanus injection before birth, antenatal visits for pregnancy, antenatal care and place of delivery. Univariate analysis deals with analyzing one variable at a time.

Bivariate analysis is concerned with the relationships between pairs of variables (x, y) in a data set. Bivariate analysis is a mode of data analysis in which two variables are examined simultaneously for the purpose of discovering whether they are related to each other, or independent of one another. Crosstabs generates information about bivariate analysis. Cross tabulation is about taking two variables and tabulating the results of one variable against the other variables. A cross tabulation gives a basic picture

of how two variables inter- relate. It helps us search for patterns of interaction. A cross tabulation displays the joint distribution of two or more variables. They are usually presented as a contingency table in a matrix format. Rows and columns correspond to the possible values of the first and the second variables, the cells contain frequencies (numbers) of occurrence of the corresponding pairs of values of the 1st and 2nd variable.

Binary logistic regression analysis has been used in order to measure the net effect of background variables on the response variables. In this study, the dependent variable is binary or dichotomous, i.e. it only contains data coded as 1 (True, success, pregnant etc.) or 0 (False, failure, non- pregnant etc.). The goal of logistic regression is to find the best fitting model to describe the relationship between the dichotomous characteristic of interest (dependent variable or response or outcome variable) and a set of independent (predictor or explanatory) variables.[6] Logistic regression generates the coefficient (and its standard errors and significance levels) of a formula to predict a logit transformation of the probability of presence of the characteristic of interest:

$$\text{logit (p)} = b_0 + b_1x_1 + b_2x_2 + \ldots\ldots\ldots\ldots + b_nx_n$$

where b_0 is constant

x_1, x_2 are the independent variables.

b_1, b_2 are the coefficients of x_1, x_2.

where p is the probability of presence of the characteristic of interest. The logit transformation is defined as the logged odds:

odds=p÷(1-p) = probability of presence of characteristic÷ probability of absence of characteristic

and $\text{logit (p)} = \ln[p \div (1-p)]$

Odds are a way of presenting probability. An odd ratio is greater than one implies that the event is more likely in the first group. An odd ratio is less than one implies that the event is less likely in the first group.[7]

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[6] Pampero, F.C. (2000); *Logistic Regression: A Primer*, Sage Publication, 2000.

[7] Blend J. M. and Altman D. G. (2000); The Odds Ratio, *British Medical Journal*, 320, 1468.

CHAPTER- FOUR

ANALYSIS

Chapter-4

Analysis

We describe results of data (NFHS-III) in Bihar and Andhra Pradesh by following headings-

4.1 Univariate analysis:-

Univariate analysis is concerned with the quantitative analysis of data where each variable is analyzed in isolation. We use univariate analysis for measuring the frequency of occurrence of a particular response category. There are total 2313 married women (samples) in Bihar and 2287 married women (samples) in Andhra Pradesh who produces their babies. There are total 586 women in Bihar and 1734 women in Andhra Pradesh who produce their children in health institutes.

4.11 Educational level:

In Bihar, women who produce their babies, 65.9 per cent of them are uneducated, 9.8 per cent have taken primary education, 21.4 per cent secondary education and 2.9 per cent higher education. Most of women who have done delivery are illiterate in Bihar. Women who have opted institutional delivery in Bihar, 34.8 per cent are uneducated, 10.1 per cent have primary level of education, 44.9 per cent secondary level of education and 10.2 per cent higher level of education. There are very few illiterate women who have opted institutional delivery in Bihar.

Women who delivered their children in Andhra Pradesh, 32.2 per cent of them are uneducated, 13.6 per cent have primary level of education, 44.1 per cent secondary level of education and 10.1 per cent higher level of education. Among the women who have opted institutional delivery, 21.6 per cent are uneducated, 12.7 per cent have primary education, 52.6 per cent secondary education and 13.0 per cent higher level of education. There is low percentage (21.6 per cent) of illiteracy among women having institutional delivery in Andhra Pradesh. Most of women, who delivered their children in medical institutes, have at least secondary level of education in both states, Bihar (44.9 per cent) and Andhra Pradesh (52.6 per cent).

Table- 4.1: Number of institutional delivery and non- institutional delivery by socio-economic determinants (Bihar)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Educational Level						
No education	204	**34.8**	1320	**76.4**	1524	**65.9**
Primary	59	**10.1**	168	**9.7**	227	**9.8**
Secondary	263	**44.9**	232	**13.4**	495	**21.4**
Higher	60	**10.2**	7	**0.4**	67	**2.9**
Total	586	**100.0**	1727	**100.0**	2313	**100.0**
Missing					0	
Birth order						
First order	225	**38.4**	332	**19.2**	557	**24.1**
2-3	241	**41.1**	634	**36.7**	875	**37.8**
4+	120	**20.5**	761	**44.1**	881	**38.1**
Total	586	**100.0**	1727	**100.0**	2313	**100.0**
Missing					0	
Standard of living index						
Low	96	**20.5**	839	**55.7**	935	**47.4**
Medium	143	**30.6**	511	**34.0**	654	**33.1**
High	229	**48.9**	155	**10.3**	384	**19.5**
Total	468	**100.0**	1505	**100.0**	1973	**100.0**
Missing					340	
Age at marriage						
Below 20	471	**80.4**	1668	**96.6**	2139	**92.5**
20+	115	**19.6**	59	**3.4**	174	**7.5**
Total	586	**100.0**	1727	**100.0**	2313	**100.0**
Missing					0	
Partner's educational level						
No education	106	**18.4**	773	**45.4**	879	**38.6**
Primary	33	**5.7**	254	**14.9**	287	**12.6**
Secondary	272	**47.3**	593	**34.8**	865	**38.0**
Higher	164	**28.5**	82	**4.8**	246	**10.8**
Total	575	**100.0**	1702	**100.0**	2277	**100.0**
Missing					36	
Exposure to mass media						
No	169	**35.1**	1037	**67.8**	1206	**60.0**
Yes	313	**64.9**	492	**32.2**	805	**40.0**
Total	482	**100.0**	1529	**100.0**	2011	**100.0**
Missing					302	
Place of residence						
Rural	271	**46.2**	1331	**77.1**	1602	**69.3**
Urban	315	**53.8**	396	**22.9**	711	**30.7**
Total	586	**100.0**	1727	**100.0**	2313	**100.0**
Missing					0	
Religion						
Non- Hindu	57	**9.7**	426	**24.7**	483	**20.9**
Hindu	528	**90.3**	1301	**75.3**	1829	**79.1**
Total	585	**100.0**	1727	**100.0**	2312	**100.0**
Missing					1	
Type of caste/ tribe						
Others	167	**28.5**	300	**17.4**	467	**20.2**
Other backward class	353	**60.2**	1060	**61.4**	1413	**61.1**
SC & ST	66	**11.3**	366	**21.2**	432	**18.7**
Total	586	**100.0**	1726	**100.0**	2312	**100.0**
Missing					1	

Source: Calculated from, NFHS-III (2005-06)

4.12 Birth order:

Twenty four per cent (24.1%) women come in first birth order, 37.8 per cent in second to third birth order and 38.1 per cent in fourth and more than fourth birth order in Bihar. Among the women who have opted institutional delivery, 38.4 per cent come in first birth order, 41.1 per cent in second to third birth order and 20.5 per cent in fourth and more than fourth birth order in Bihar.

In Andhra Pradesh 38.0 per cent women belong to first birth order, 51.2 per cent to second to third birth order and 10.7 per cent to fourth and above birth order. Women who delivered their children in medical institutes, 41.5 per cent of them belong to first birth order, 49.4 per cent to second to third birth order and 9.1 per cent to fourth and above birth order in Andhra Pradesh. There is high proportion of institutional delivery in second to third birth order. There is low proportion of institutional delivery in fourth and above birth order in Andhra Pradesh. Most of women, who delivered their children in medical institutes, belong to second to third birth order in both states of Bihar (41.1 per cent) and Andhra Pradesh (49.4 per cent) respectively.

4.13 Standard of living:

In Bihar, women who produce their children, 47.4 per cent have low standard of living, 33.1 per cent medium standard of living and 19.5 per cent high standard of living. Women who have gone for delivery in medical institutes, 20.5 per cent have low standard of living, 30.6 per cent medium standard of living and 48.9 per cent high standard of living in Bihar. Most of institutional deliveries in Bihar belong to high standard of living.

In Andhra Pradesh 46.4 per cent women belong to high standard of living, 36.3 per cent to medium standard of living and 17.2 per cent to low standard of living. In Andhra Pradesh women who have done institutional delivery, 55.2 per cent have high living standard, 33.1 per cent medium living standard and 11.7 per cent low living standard. Thus the percentage of institutional delivery is greater in high standard of living than low or medium standard of living in Andhra Pradesh. Most of women, who delivered their children in medical institutes, belong to high standard of living in both states of Bihar (48.9 per cent) and Andhra Pradesh (55.2 per cent) respectively.

Table- 4.2: Number of institutional delivery and non- institutional delivery by socio-economic determinants (Andhra Pradesh)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Educational Level						
No education	375	**21.6**	361	**65.3**	736	**32.2**
Primary	221	**12.7**	89	**16.1**	310	**13.6**
Secondary	912	**52.6**	97	**17.5**	1009	**44.1**
Higher	226	**13.0**	6	**1.1**	232	**10.1**
Total	1734	**100.0**	553	**100.0**	2287	**100.0**
Missing					0	
Birth order						
First order	719	**41.5**	151	**27.3**	870	**38.0**
2-3	857	**49.4**	315	**57.0**	1172	**51.2**
4+	158	**9.1**	87	**15.7**	245	**10.7**
Total	1734	**100.0**	553	**100.0**	2287	**100.0**
Missing					0	
Standard of living index						
Low	183	**11.7**	170	**34.8**	353	**17.2**
Medium	516	**33.1**	228	**46.6**	744	**36.3**
High	860	**55.2**	91	**18.6**	951	**46.4**
Total	1559	**100.0**	489	**100.0**	2048	**100.0**
Missing					239	
Age at marriage						
Below 20	1248	**72.0**	494	**89.3**	1742	**76.2**
20+	486	**28.0**	59	**10.7**	545	**23.8**
Total	1734	**100.0**	553	**100.0**	2287	**100.0**
Missing					0	
Partner's educational level						
No education	331	**19.3**	258	**47.3**	589	**26.0**
Primary	189	**11.0**	90	**16.5**	279	**12.3**
Secondary	853	**49.6**	175	**32.1**	1028	**45.4**
Higher	346	**20.1**	22	**4.0**	368	**16.3**
Total	1719	**100.0**	545	**100.0**	2264	**100.0**
Missing					23	
Exposure to mass media						
No	406	**25.4**	286	**56.4**	692	**32.9**
Yes	1193	**74.6**	221	**43.6**	1414	**67.1**
Total	1599	**100.0**	507	**100.0**	2106	**100.0**
Missing					181	
Place of residence						
Rural	477	**27.5**	369	**66.7**	846	**37.0**
Urban	1257	**72.5**	184	**33.3**	1441	**63.0**
Total	1734	**100.0**	553	**100.0**	2287	**100.0**
Missing					0	
Religion						
Non- Hindu	571	**32.9**	71	**12.8**	642	**28.1**
Hindu	1163	**67.1**	482	**87.2**	1645	**71.9**
Total	1734	**100.0**	553	**100.0**	2287	**100.0**
Missing					0	
Type of caste/ tribe						
Others	723	**41.8**	81	**14.6**	804	**35.2**
Other backward class	698	**40.3**	272	**49.2**	970	**42.5**
SC & ST	309	**17.9**	200	**36.2**	509	**22.3**
Total	1730	**100.0**	553	**100.0**	2283	**100.0**
Missing					4	

Source: Calculated from, NFHS-III (2005-06)

4.14 Age at marriage:

In Bihar 92.5 per cent women have done marriage under the age of 20 years and 7.5 per cent at the age of 20 years or above. 80.4 per cent women who have done delivery in medical institutes have done marriage under the age of 20 years and 19.6 per cent women at the age of 20 years or above in Bihar.

The percentages of women having married under the age of 20 years are 76.2 in Andhra Pradesh. Twenty four per cent (23.8%) women have married above the age of 20 years in Andhra Pradesh. Thus there is high delivery among those women who married under the age of 20 years. Women who delivered their children in medical institutes, 72.0 per cent of them have married under the age of 20 years and 28.0 per cent have married the age of 20 years or above in Andhra Pradesh. Most of institutional deliveries have done by those women who have married under the age of 20 years in Andhra Pradesh and Bihar.

4.15 Partner's educational level:

38.6 per cent whose husbands are uneducated, 12.6 per cent have primary level of education, and 38.0 per cent secondary level of education and 10.8 per cent higher level of education in Bihar. Among the spouses of those women who have opted institutional delivery, 18.4 per cent are illiterate, 5.7 per cent have primary level of education, 47.3 per cent secondary level of education and 28.5 per cent higher level of education in Bihar. Among those women who have done institutional delivery, most of their spouses have secondary level of education in Bihar. There is 26.0 per cent difference between uneducated husband and primary educated husband in Bihar.

Spouses of those women who delivered their children in Andhra Pradesh, 26 per cent are illiterate, 12.3 per cent have primary level of education, 45.4 per cent secondary education and 16.3 per cent higher level of education. Spouses of those women who birth their children in medical institutes, 19.3 per cent are uneducated, 11.0 per cent have completed primary level of education, 49.6 per cent secondary level of education and 20.1 per cent higher level of education in Andhra Pradesh. Most of husbands, whose

wives delivered their children in medical institutes, have secondary level of education in both states, Bihar (47.3 per cent) and Andhra Pradesh (49.6 per cent).

4.16 Exposure to mass media:

In Bihar 60.0 per cent women are not exposed to mass media and only 40.0 per cent are exposed to mass media. Women who have done institutional delivery, 35.1 per cent are not exposed to mass media and 64.9 per cent are exposed to mass media in Bihar. Most of women among who delivered in medical institutes are exposed to mass media in Bihar.

67.1 per cent women are exposed to mass media and 32.9 per cent women are not exposed to mass media in Andhra Pradesh. Women who delivered their children in medical institutes, 74.6 per cent exposed to mass media and 25.4 per cent women didn't expose to mass media in Andhra Pradesh. Thus there is high level exposure to mass media among those women having institutional delivery. It reflects that exposure to mass media is high among women in Andhra Pradesh. Most of women, who delivered their children in medical institutes, are exposed to mass media in both states, Bihar (47.3 per cent) and Andhra Pradesh (49.6 per cent).

4.17 Place of residence:

In Bihar 69.3 per cent women live in rural areas and rest are urban. Women who have done institutional delivery, 46.2 per cent women are rural and 53.8 per cent are urban in Bihar. More than fifty per cent women among those women who have gone for institutional delivery are urban in Bihar. There are 63.0 per cent urban women and 37.0 per cent rural women in Andhra Pradesh. There are 72.5 per cent urban women and 27.5 per cent rural women among those who delivered their children in medical institutes in Andhra Pradesh. Most of women, who delivered their children in health institutes, are urban in both states of Bihar (53.8 per cent) and Andhra Pradesh (72.5 per cent).

4.18 Religion:

In Bihar, 79.1 per cent of women belong to Hindu religion and 20.9 per cent women belong to other religions (non Hindu). Women who birth their babies in health

institutes, 90.3 per cent among them are followers of Hindu religion and 9.7 per cent are followers of other religions (non Hindu) in Bihar.

In Andhra Pradesh 71.9 per cent women belong to Hindu religion and 28.1 per cent women belong to non Hindu religion. Those women who have done institutional delivery, among them 67.1 per cent belong to Hindu religion and 32.9 per cent belong to non Hindu religion in Andhra Pradesh. Those women who have gone for institutional delivery, among them Hindus (67.1 per cent) are greater than others.

4.19 Caste or tribe:

In Bihar 18.7 per cent women belong to Scheduled Caste or Tribe, 61.1 per cent women belong to Other Backward Caste and 20.2 per cent women belong to other caste (non Other Backward Caste and non Scheduled Caste or Tribe). In Bihar those women who delivered their children in health institutes 11.3 per cent belong to Scheduled Caste or Tribe, 60.2 per cent belong to Other Backward Caste and 28.5 per cent belong to other caste (non Other Backward Caste and non Scheduled Caste or Tribe).

35.2 per cent women belong to other caste category (non Other Backward Caste and non Scheduled Caste or Tribe), 42.5 per cent women belong to Other Backward Caste and 22.3 per cent women belong to Scheduled Caste or Tribe in Andhra Pradesh. Women who have done institutional delivery, among them 41.8 per cent belong to other caste category (non Other Backward Caste and non Scheduled Caste or Tribe), 40.3 per cent women belong to Other Backward Caste, and 17.9 per cent women belong to Scheduled Caste or Tribe in Andhra Pradesh. In institutional delivery, other caste category (non Other Backward Caste and non Scheduled Caste or Tribe) has high proportion.

Most of women, who delivered their children in medical institutes in Bihar, belong to Other Backward Caste (60.2 per cent); while Most of women, who delivered their children in medical institutes in Andhra Pradesh, belong to other castes (41.8 per cent).

Table- 4.3 Number of institutional delivery and non- institutional delivery by antenatal care (Bihar)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Days iron tablets/syrup taken						
Less than 90 or 90	144	**59.3**	218	**88.3**	362	**73.9**
More than 90	99	**40.7**	29	**11.7**	128	**26.1**
Total	243	**100.0**	247	**100.0**	490	**100.0**
Missing					1823	
Tetanus injection						
Received no injection	31	**7.5**	275	**24.3**	306	**19.8**
Less than 2 or 2	223	**53.6**	453	**40.1**	676	**43.7**
More than 2	162	**38.9**	403	**35.6**	565	**36.5**
Total	416	**100.0**	1131	**100.0**	1547	**100.0**
Missing					766	
Antenatal visit						
No antenatal visit	138	**33.1**	823	**72.9**	961	**62.2**
Less than 2 or 2	68	**16.3**	189	**16.7**	257	**16.6**
More than 2	211	**50.6**	117	**10.4**	328	**21.2**
Total	417	**100.0**	1129	**100.0**	1546	**100.0**
Missing					767	
Antenatal care						
Partially ANC	209	**84.6**	244	**95.3**	453	**90.1**
Fully ANC	38	**15.4**	12	**4.7**	50	**9.9**
Total	247	**100.0**	256	**100.0**	503	**100.0**
Missing					1810	

Source: Calculated from, NFHS-III (2005-06)

4.20 Antenatal care:

In Bihar 73.9 per cent women have taken iron tablets or syrup less than 90 or 90 days and 26.1 per cent women have taken iron tablets or syrup more than 90 days. Women who delivered their children in health institutes, among them 59.3 per cent take iron tablets or syrup less than 90 days and 40.7 per cent take iron tablets or syrup more than 90 days in Bihar. 36.5 per cent women have taken iron tablets or syrup more than 90 days and 63.5 per cent women have taken iron tablets or syrups less than 90 days in Andhra Pradesh. 39.5 per cent women among those women, who have done institutional delivery, have taken iron tablets or syrup more than 90 days. 60.5 per cent women among those women, who have done institutional delivery, have taken iron tablets or syrup less than 90 days in Andhra Pradesh. Thus most of women have taken iron tablets or syrup less than 90 days in Andhra Pradesh.

Table- 4.4 Number of institutional delivery and non- institutional delivery by antenatal care (Andhra Pradesh)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Days iron tablets/syrup taken						
Less than 90 or 90	621	**60.5**	200	**75.2**	821	**63.5**
More than 90	406	**39.5**	66	**24.8**	472	**36.5**
Total	1027	**100.0**	266	**100.0**	1293	**100.0**
Missing					994	
Tetanus injection						
Received no injection	42	**3.4**	49	**12.5**	91	**5.6**
Less than 2 or 2	676	**54.5**	195	**49.6**	871	**53.3**
More than 2	523	**42.1**	149	**37.9**	672	**41.1**
Total	1241	**100.0**	393	**100.0**	1634	**100.0**
Missing					653	
Antenatal visit						
No antenatal visit	24	**1.9**	55	**13.7**	79	**4.7**
Less than 2 or 2	66	**5.2**	53	**13.2**	119	**7.1**
More than 2	1185	**92.9**	294	**73.1**	1479	**88.2**
Total	1275	**100.0**	402	**100.0**	1677	**100.0**
Missing					610	
Antenatal care						
Partially ANC	842	**82.4**	239	**90.5**	1081	**84.1**
Fully ANC	180	**17.6**	25	**9.5**	205	**15.9**
Total	1022	**100.0**	264	**100.0**	1286	**100.0**
Missing					1001	

Source: Calculated from, NFHS-III (2005-06)

19.8 per cent women haven't receive any tetanus injection during delivery period, 43.7 per cent women have received less than two or two tetanus injections and 36.5 per cent women have received more than two tetanus injections in Bihar. Those women who birth their babies in medical institutes, among them 7.5 per cent women don't receive any tetanus injection during pregnancy period, 53.6 per cent receive tetanus injections two times or below and 38.9 per cent women receive more than two tetanus injections in Bihar. In Andhra Pradesh 5.6 per cent women didn't receive any tetanus injection during pregnancy period, 53.3 per cent women received less 2 tetanus injections or below and 41.1 per cent women received more than 2 tetanus injections. 3.4 per cent women among those women, who have gone for institutional delivery, don't receive any tetanus injection, 54.5 per cent women received 2 tetanus injections or below and 42.1 per cent

women received more than 2 tetanus injections in Andhra Pradesh. More than 50 per cent women in Andhra Pradesh don't receive any tetanus injection.

In Bihar, 62.2 per cent women do not visit antenatal care, 16.6 per cent women have gone antenatal care less than two or two times and 21.2 per cent delivered women have gone antenatal visit more than two times. Women who birth their children in health institutes 33.1 per cent among them do not go for antenatal visit, 16.3 per cent go for antenatal visit less than two or two times and 50.6 per cent go for antenatal visit more than two times in Bihar. More than fifty per cent women among those who have done institutional delivery have gone for antenatal visit more than two times in Bihar. In Andhra Pradesh 4.7 per cent women haven't go antenatal care during pregnancy period, 7.1 per cent women have gone antenatal care less than 2 or 2 times and 88.2 per cent women have gone antenatal care more than 2 times. In Andhra Pradesh those women who delivered their children in health institute, among them 1.9 per cent don't go antenatal care during pregnancy period, 5.2 per cent women have gone antenatal care less than three times and 92.9 per cent women have gone antenatal care more than two times. Most of women in Andhra Pradesh have gone antenatal care more than two times.

90.1 per cent women have taken antenatal care partially and 9.9 per cent women have taken antenatal care fully in Bihar. Women who have done institutional delivery, 84.6 per cent are taken antenatal care partially and 15.4 per cent are taken antenatal care fully in the state of Bihar. In Andhra Pradesh 84.1 per cent women take antenatal care partially and 15.9 per cent delivered women take antenatal care fully. 82.4 per cent women among those women, who have gone for institutional delivery, have taken antenatal care partially and 17.6 per cent women have taken antenatal care fully in Andhra Pradesh.

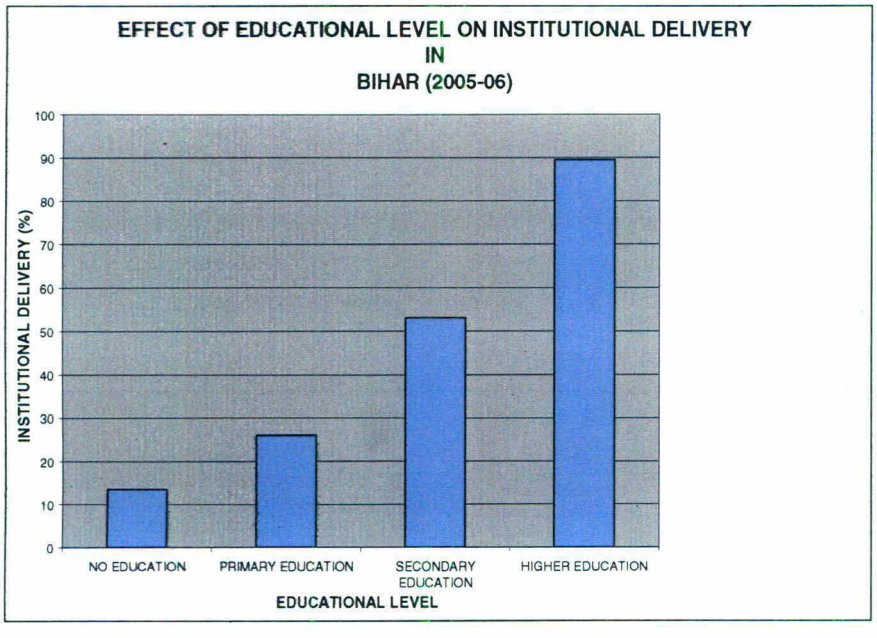
Most of women among institutional delivery have taken iron tablets or syrup less than 90 or 90 days in both states Bihar (59.3%) and Andhra Pradesh (60.5%). Most of women among institutional delivery have taken tetanus injection less than two or two times in both states Bihar (53.6%) and Andhra Pradesh (54.5%). In Bihar only 50.6 % women among institutional delivery have gone for antenatal care while in Andhra Pradesh 92.9 per cent women have gone for antenatal care. There is high percentage of

partially antenatal care taken women in both states Bihar (84.6 %) and Andhra Pradesh (82.4%).

4.20 Bivariate analysis:-

There are total 2313 married women, surveyed in Bihar, who give birth their children during National Family Health Survey- III (2005-06). In Bihar 25.3 per cent women have institutional delivery. There are total 2287 women surveyed in Andhra Pradesh, who give birth child during National Family Health Survey- III (2005-06). In Andhra Pradesh 75.8 per cent women have institutional delivery. Bivariate analysis is concerned with the relationships between pairs of variables (x, y) in a data set. Cross tabulation has done in bivariate analysis.

Bar diagram: 4.1



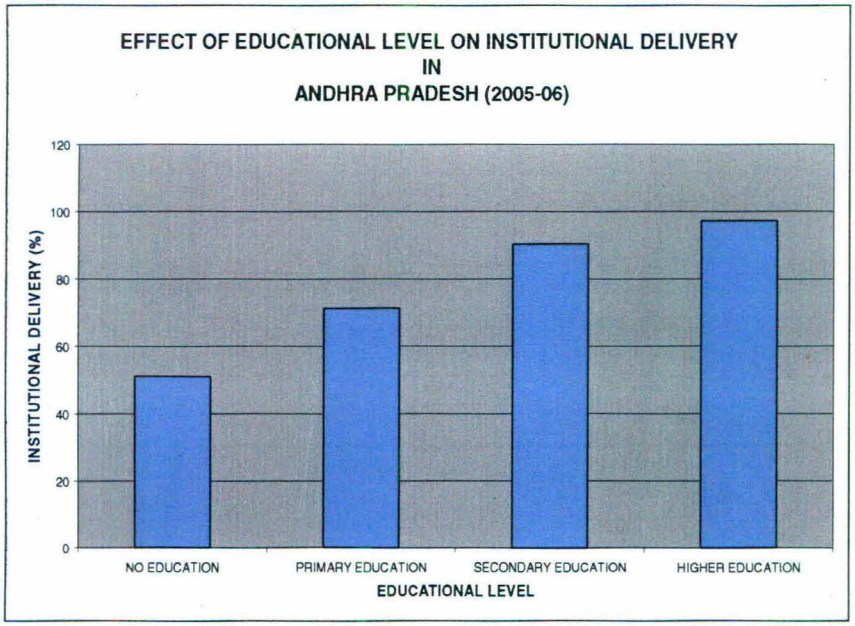
Source: NFHS-III (2005-06)

4.201 Educational level:

In Bihar 13 (13.4) per cent uneducated women give birth in health institutes. 26.0 per cent women belonging to primary education category have institutional delivery. 53 (53.1) per cent women having secondary level of education have institutional delivery. In

Bihar 90 (89.6) per cent women having higher level of education delivered their children in health institutes. There are 13 (12.6) percentage differences in institutional delivery between those women having no education and those having primary level of education. There are 64 (63.6) percentage differences in institutional delivery between those women having primary level of education and those having higher level of education in the state of Bihar. There are 76 (76.2) percentage differences in institutional delivery between those women having no education and those having higher level of education. Thus primary level of education has not strong effect on institutional delivery in comparison of higher level of education. As level of education increase, institutional delivery also increases.

Bar diagram: 4.2



Source: NFHS-III (2005-06)

In Andhra Pradesh 51.0 per cent uneducated women have institutional delivery. Women having primary level of education have 71 (71.3) per cent institutional delivery. Women having secondary level of education, 90 (90.4) per cent delivered in a medical institutes. In Andhra Pradesh 97 (97.4) per cent women having higher level of education give birth in health institutes.

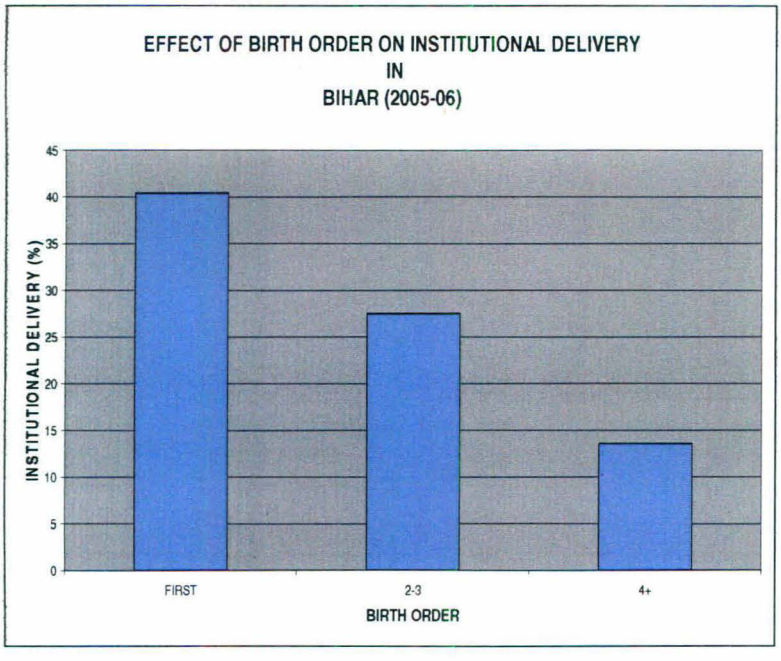
Table- 4.5: Number of institutional delivery and non- institutional delivery by socio-economic determinants (Bihar)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Educational Level						
No education	204	**13.4**	1320	**86.6**	1524	100.0
Primary	59	**26.0**	168	**74.0**	227	100.0
Secondary	263	**53.1**	232	**46.9**	495	100.0
Higher	60	**89.6**	7	**10.4**	67	100.0
Total	586	**25.3**	1727	**74.7**	2313	100.0
Missing					0	
Birth order						
First order	225	**40.4**	332	**59.6**	557	100.0
2-3	241	**27.5**	634	**72.5**	875	100.0
4+	120	**13.6**	761	**86.4**	881	100.0
Total	586	**25.3**	1727	**74.7**	2313	100.0
Missing					0	
Standard of living index						
Low	96	**10.3**	839	**89.7**	935	100.0
Medium	143	**21.9**	511	**78.1**	654	100.0
High	229	**59.6**	155	**40.4**	384	100.0
Total	468	**23.7**	1505	**76.3**	1973	100.0
Missing					340	
Age at marriage						
Below 20	471	**22.0**	1668	**78.0**	2139	100.0
20+	115	**66.1**	59	**33.9**	174	100.0
Total	586	**25.3**	1727	**74.7**	2313	100.0
Missing					0	
Partner's educational level						
	106	**12.1**	773	**87.9**	879	100.0
No education	33	**11.5**	254	**88.5**	287	100.0
Primary	272	**31.4**	593	**68.6**	865	100.0
Secondary	164	**66.7**	82	**33.3**	246	100.0
Higher	575	**25.3**	1702	**74.7**	2277	100.0
Total					36	
Missing						
Exposure to mass media		**14.0**				
No	169	**38.9**	1037	**86.0**	1206	100.0
Yes	313	**24.0**	492	**61.1**	805	100.0
Total	482		1529	**76.0**	2011	100.0
Missing					302	
Place of residence						
Rural	271	**16.9**	1331	**83.1**	1602	100.0
Urban	315	**44.3**	396	**55.7**	711	100.0
Total	586	**25.3**	1727	**74.7**	2313	100.0
Missing					0	
Religion						
Non- Hindu	57	**11.8**	426	**88.2**	483	100.0
Hindu	528	**28.9**	1301	**71.1**	1829	100.0
Total	585	**25.3**	1727	**74.7**	2312	100.0
Missing					1	
Type of caste/ tribe	167	**35.8**				
Others	353	**25.0**	300	**64.2**	467	100.0
Other backward class	66	**15.3**	1060	**75.0**	1413	100.0
SC & ST	586	**25.3**	366	**84.7**	432	100.0
Total			1726	**74.7**	2312	100.0
Missing					1	

Source: Calculated from, NFHS-III (2005-06)

There are 46 (46.4) percentage differences in institutional delivery between those women having higher level of education and those having no education in the state of Andhra Pradesh. There are 26 (26.1) percentage differences in institutional delivery between those women having higher level of education and those having primary level of education. Secondary and higher level of education has strong effect on institutional delivery in Andhra Pradesh. There are 20.3 percentages differences in institutional delivery in Andhra Pradesh between primary educated and uneducated women. Higher level of education has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh).

Bar diagram: 4.3



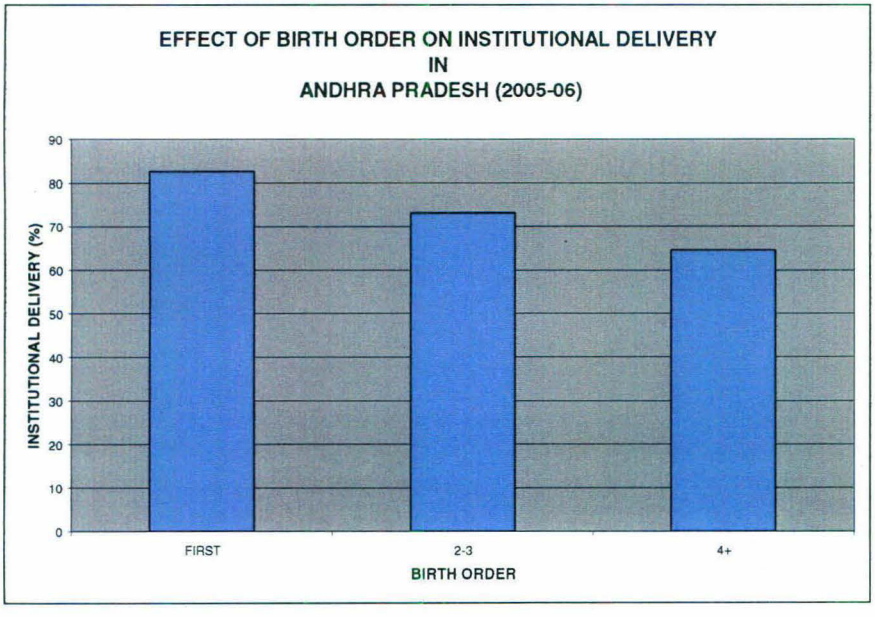
Source: NFHS-III (2005-06)

4.202 Birth order:

Women belonging to first birth order category have 40 (40.4) per cent institutional delivery in the state of Bihar. Women belonging to second and third birth order category, 28 (27.5) per cent delivered in health institute in Bihar. Women belonging to fourth and above birth order category, 14 (13.6) per cent birth their children in medical institutes in Bihar. There are 13 (12.9) percentage differences in institutional delivery between those women having first birth order and those having second to third birth order

in Bihar. There are 27 (26.8) percentage differences in institutional delivery between those women having first birth order and those having fourth and more than fourth birth order in Bihar. There is high institutional delivery among women who go for first birth order. The probability of death was higher among first to second birth order. Women having more than one birth are less likely to go for institutional delivery. Due to higher probability of death and fear from first delivery, women prefer institutional delivery for their first birth.

Bar diagram: 4.4



Source: NFHS-III (2005-06)

In Andhra Pradesh women belonging to first birth order category have 83 (82.6) per cent institutional delivery. Women having second to third birth order of child, 73 (73.1) per cent delivered in health institutes in Andhra Pradesh. Women have 65 (64.5) per cent institutional delivery during fourth and above birth order of child in the state of Andhra Pradesh. There are 18 (18.1) percentage differences in institutional delivery between fourth and above birth order category and first birth order category.

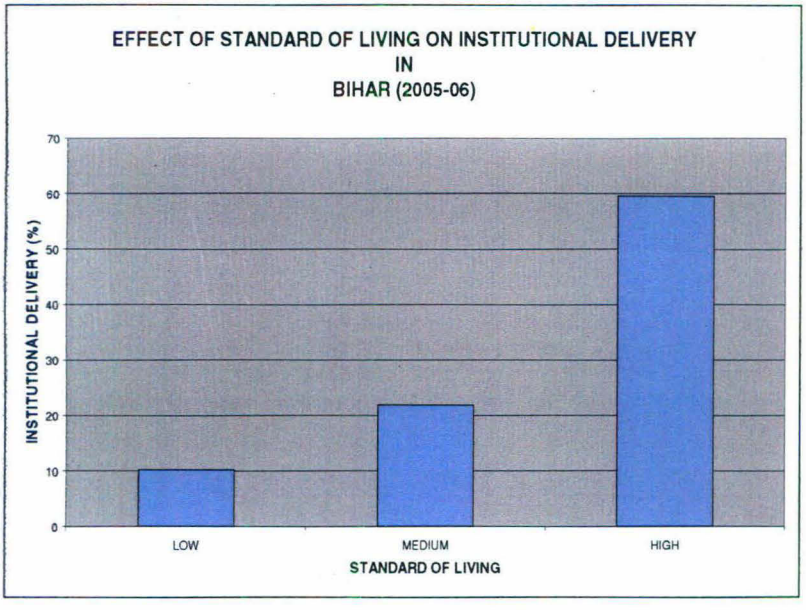
Table- 4.6: Number of institutional delivery and non- institutional delivery by socio-economic determinants (Andhra Pradesh)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Educational Level						
No education	375	**51.0**	361	**49.0**	736	100.0
Primary	221	**71.3**	89	**28.7**	310	100.0
Secondary	912	**90.4**	97	**9.6**	1009	100.0
Higher	226	**97.4**	6	**2.6**	232	100.0
Total	1734	**75.8**	553	**24.2**	2287	100.0
Missing					0	
Birth order						
First order	719	**82.6**	151	**17.4**	870	100.0
2-3	857	**73.1**	315	**26.9**	1172	100.0
4+	158	**64.5**	87	**35.5**	245	100.0
Total	1734	**75.8**	553	**24.2**	2287	100.0
Missing					0	
Standard of living index						
Low	183	**51.8**	170	**48.2**	353	100.0
Medium	516	**69.4**	228	**30.6**	744	100.0
High	860	**90.4**	91	**9.6**	951	100.0
Total	1559	**76.1**	489	**23.9**	2048	100.0
Missing					239	
Age at marriage						
Below 20	1248	**71.6**	494	**28.4**	1742	100.0
20+	486	**89.2**	59	**10.8**	545	100.0
Total	1734	**75.8**	553	**24.2**	2287	100.0
Missing					0	
Partner's educational level						
No education	331	**56.2**	258	**43.8**	589	100.0
Primary	189	**67.7**	90	**32.3**	279	100.0
Secondary	853	**83.0**	175	**17.0**	1028	100.0
Higher	346	**94.0**	22	**6.0**	368	100.0
Total	1719	**75.9**	545	**24.1**	2264	100.0
Missing					23	
Exposure to mass media						
No	406	**58.7**	286	**41.3**	692	100.0
Yes	1193	**84.4**	221	**15.6**	1414	100.0
Total	1599	**75.9**	507	**24.1**	2106	100.0
Missing					181	
Place of residence						
Rural	477	**56.4**	369	**43.6**	846	100.0
Urban	1257	**87.2**	184	**12.8**	1441	100.0
Total	1734	**75.8**	553	**24.2**	2287	100.0
Missing					0	
Religion						
Non- Hindu	571	**88.9**	71	**11.1**	642	100.0
Hindu	1163	**70.7**	482	**29.3**	1645	100.0
Total	1734	**75.8**	553	**24.2**	2287	100.0
Missing					0	
Type of caste/ tribe						
Others	723	**89.9**	81	**10.1**	804	100.0
Other backward class	698	**72.0**	272	**28.0**	970	100.0
SC & ST	309	**60.7**	200	**39.3**	509	100.0
Total	1730	**75.8**	553	**24.2**	2283	100.0
Missing					4	

Source: Calculated from, NFHS-III (2005-06)

There are 10 (9.5) percentage differences in institutional delivery between those women having first birth order and those having second to third birth order in Andhra Pradesh. There is high institutional delivery for first birth order in both states (Bihar and Andhra Pradesh).

Bar diagram: 4.5

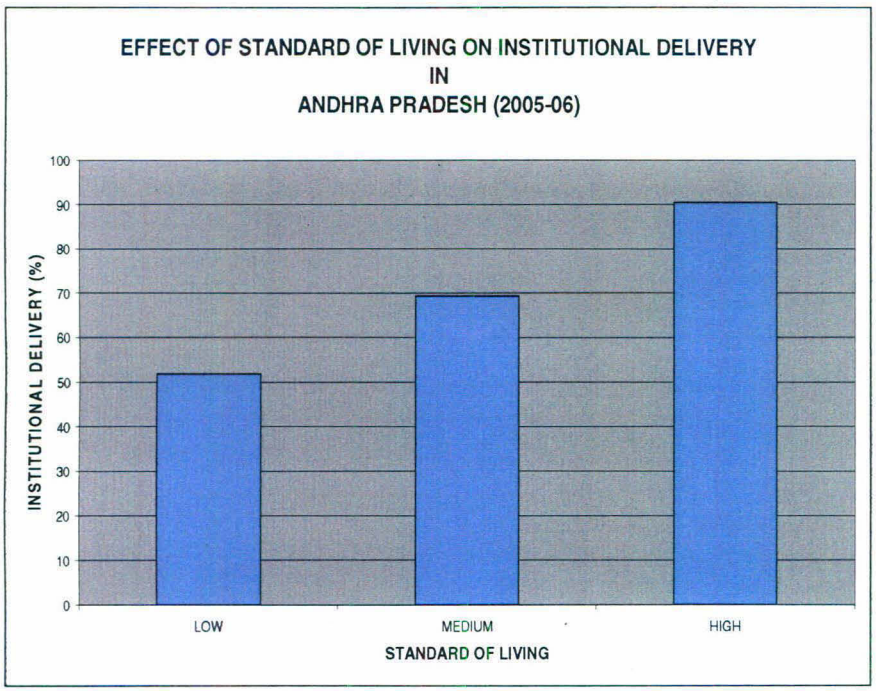


Source: NFHS-III (2005-06)

4.203 Standard of living:

In Bihar 10 (10.3) per cent women belonging to low standard of living have institutional delivery. Women having medium standard of living have 22 (21.9) per cent institutional delivery. 60 (59.6) per cent women having high standard of living delivered in health institutes in Bihar. There are 49 (49.3) percentage differences in institutional delivery between high standard of living women and low standard of living women in the state of Bihar. There are 38 (37.7) percentage differences in institutional delivery between high standard of living women and medium standard of living in Bihar. There are 12 (11.6) per cent differences in institutional delivery between medium standard of living women and low standard of living women in Bihar. Thus there is positive relationship between standard of living of women and institutional delivery. As standard of living of women rise, institutional delivery also rises.

Bar diagram: 4.6



Source: NFHS-III (2005-06)

In Andhra Pradesh 52 (51.8) per cent women belonging to low level of living standard, birth their babies in medical institutes. 69 (69.4) per cent women having medium level of living standard delivered their children in health institutes in Andhra Pradesh. 90 (90.4) per cent women belonging to high standard of living have institutional delivery in the state of Andhra Pradesh. There are 39 (38.6) percentage differences in institutional delivery between high standard of living and low standard of living women in Andhra Pradesh. There are 21.0 per cent differences in institutional delivery between high standard and medium standard women in the state of Andhra Pradesh. There are 18 (17.6) percentage differences in institutional delivery between low standard and medium standard women in Andhra Pradesh. There is very high institutional delivery among high standard of living women. High living standard has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh).

4.204 Age at marriage:

Age at marriage is a subject of great practical importance as it is related to both socio- economic background and achievements. In Bihar 22 per cent women whose age at marriage is below 20 years have institutional delivery. There are 66 (66.1) per cent women in Bihar whose age at marriage is 20 years or above, delivered their children in health institutes. There are 44 (44.1) percentage differences in institutional delivery between those women whose age at marriage is below 20 years and those having age at marriage is 20 years or above in Bihar. Very few women whose age at marriage is below 20 years give birth in medical institutes in comparison of those having age at marriage is 20 years or above.

Age at marriage has good effect on institutional delivery. In Andhra Pradesh there are 72 (71.6) per cent women whose age at marriage is below twenty years have institutional delivery. Women those age at marriage is twenty years or above have 89 (89.2) per cent institutional delivery. There are 18 (17.6) percentage differences in institutional delivery between those women whose age at marriage is below twenty years and those having age at marriage is twenty years or above. There is very high institutional delivery among those delivered women whose age at marriage is twenty years or above in both states (Bihar and Andhra Pradesh).

4.205 Partner's educational level:

In Bihar 12 (12.1) per cent women whose spouses are uneducated have institutional delivery. Women whose husbands have primary level of education have 12 (11.5) per cent of institutional delivery. 31 (31.4) per cent women, whose spouses have secondary level of education, produce their babies in medical institutes in Bihar. 67 (66.7) per cent women whose husbands have high level of education, delivered their children in health institutes in Bihar. There are 55 (54.6) percentage differences in institutional delivery between those women whose spouses have no education and those women whose spouses have higher level of education in Bihar. There are 55 (55.2) percentage differences in institutional delivery between those women whose husbands have primary level of education and whose husbands have higher level of education in the state of Bihar. There are 35 (35.3) per cent differences in institutional delivery

between those women whose spouses have higher level of education and whose spouses have secondary level of education in Bihar. There are 19 (19.3) per cent differences in institutional delivery between those women whose spouses are uneducated and whose spouses have secondary level of education in Bihar. There are 20 (19.9) per cent differences in institutional delivery between those women whose spouses have primary level of education and whose spouses have secondary level of education in the state of Bihar. Primary level of education of husband has not strong effect on institutional delivery in Bihar. Higher level of education of husband has strong effect on institutional delivery.

In Andhra Pradesh women whose spouses are uneducated have 56 (56.2) per cent institutional delivery. 68 (67.7) per cent women whose husbands have primary level of education have institutional delivery in Andhra Pradesh. 83.0 per cent women whose spouses have secondary level of education delivered in health institutes in the state of Andhra Pradesh. Women, whose husbands have higher level of education, 94.0 per cent delivered their babies in medical institutes. There are 12 (11.5) percentage differences in institutional delivery between those women whose spouses have no education and whose spouses have primary level of education in Andhra Pradesh. There are 38 (37.8) percentage differences in institutional delivery between those women whose husbands have no education and whose husbands have higher level of education in the state of Andhra Pradesh. There are 26 (26.3) percentage differences in institutional delivery between those women whose spouses have primary level of education and whose spouses have higher level of education in Andhra Pradesh. There are 11.0 percentage differences in institutional delivery between those women whose husbands have higher level of education and whose husbands have secondary level of education in Andhra Pradesh. There are 27 (26.8) percentage differences in institutional delivery between those women whose spouses are uneducated and those women whose spouses have secondary level of education in Andhra Pradesh. There are 15 (15.3) percentage differences in institutional delivery between those women whose husbands have secondary level of education and whose husbands have primary level of education in Andhra Pradesh. Higher level of partner's education has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh). Primary level of partner's education has not strong effect on

institutional delivery in comparison of secondary level of education and higher level of education.

4.206 Exposure to mass media:

Education level of women in Bihar is very low. So in mass media, reading newspaper is not taken. In mass media 'have radio' and 'have television' are taken. In Bihar 39 (38.9) per cent women who have either radio or television or both, have institutional delivery. 14.0 per cent of women who are not exposed to mass media have institutional delivery in Bihar. There are 24.9 percentage differences in institutional delivery between those women who are exposed to mass media and those who are not exposed to mass media in Bihar.

In Andhra Pradesh women who have neither radio nor television, 59 (58.7) per cent are delivered in medical institutes. Women who have either radio or television or both, they have 84 (84.4) per cent institutional delivery in Andhra Pradesh. There are 26 (25.7) percentage differences in institutional delivery between those women who expose to mass media and those women who don't expose to mass media in Andhra Pradesh. Those women who exposed to mass media have higher institutional delivery than those women who don't expose to mass media in Bihar and Andhra Pradesh.

4.207 Place of residence:

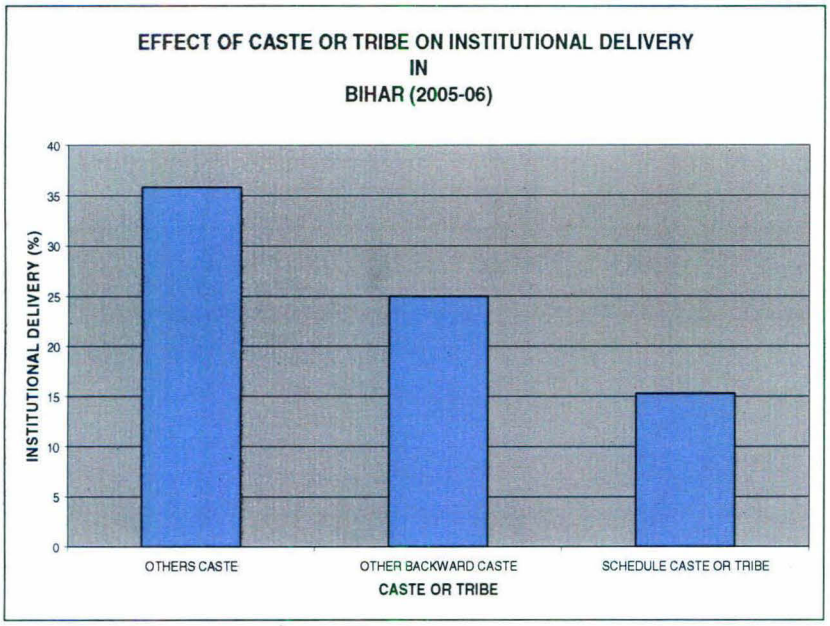
In Bihar 17 (16.9) per cent women belonging to rural category have institutional delivery. Women belonging to urban category have 44 (44.3) per cent institutional delivery. There are 27 (27.4) percentage differences in institutional delivery between rural women and urban women in Bihar. In Andhra Pradesh 56 (56.4) per cent women belonging to rural category delivered their children in medical institutes. 87 (87.2) per cent women belonging to urban category birth their babies in health institutes in Andhra Pradesh. There are 31 (30.8) percentage differences in institutional delivery between rural women and urban women in Andhra Pradesh. There is high institutional delivery among urban women in both states (Bihar and Andhra Pradesh).

4.208 Religion:

Religion is sub- divided into two categories- one is Hindu religion and second is non- Hindu religion. In Bihar 12 (11.8) per cent women belonging to non- Hindu religion category have institutional delivery. Women belonging to Hindu religion have 29 (28.9) per cent institutional delivery. There are 17 (17.1) percentage differences in institutional delivery between Hindu religion women and non-Hindu religion women. In Bihar institutional delivery is higher among Hindu women in comparison to non-Hindu women.

In Andhra Pradesh 89 (88.9) per cent women belonging to non-Hindu religion category delivered their children in health institutes. Women belonging to Hindu religion have 71 (70.7) per cent institutional delivery. There are 18 (18.2) percentage differences in institutional delivery between non-Hindu women and Hindu women. There is high institutional delivery among non-Hindu women in the comparison of Hindu women in the state of Andhra Pradesh.

Bar diagram 4.7

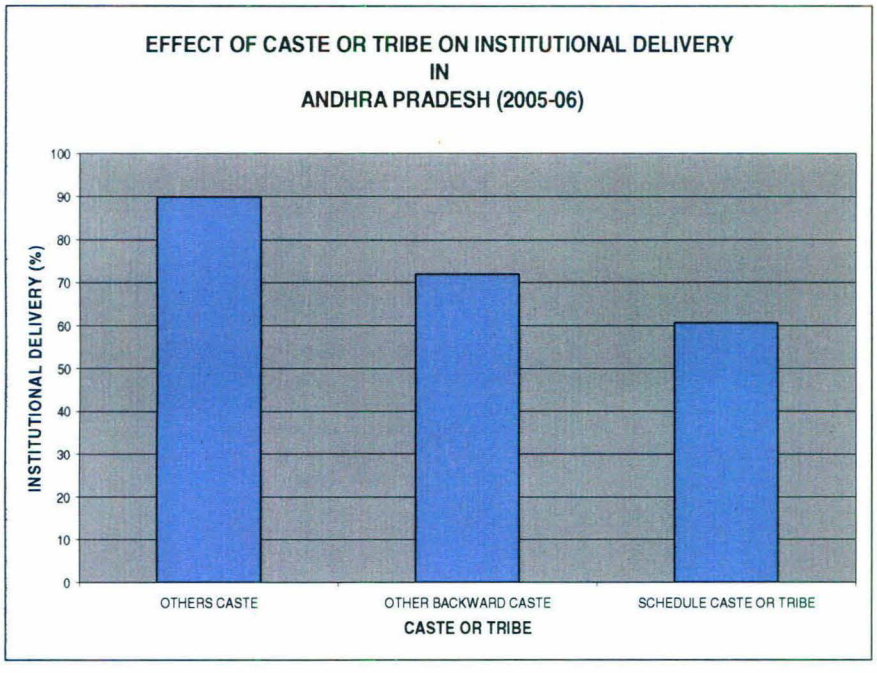


Source: NFHS-III (2005-06)

4.209 Caste or tribe:

In Bihar 36 (35.8) per cent women belonging to other caste (non Other Backward Caste or non Scheduled Caste or Tribe) have institutional delivery. Women belonging to Other Backward Caste have 25.0 per cent institutional delivery. 15 (15.3) per cent women belonging to Scheduled Caste or Tribe delivered in health institutes in Bihar. There are 21 (20.5) percentage differences in institutional delivery between Scheduled Caste or Tribe women and other caste (non Other Backward Caste or non Scheduled Caste or Tribe) women in Bihar. There are 10 (9.7) per cent differences in institutional delivery between Scheduled Caste or Tribe women and Other Backward Caste women in Bihar. There is low institutional delivery among Scheduled Caste or Tribe women in comparison to Other Backward Class and other caste (non Other Backward Caste or non Scheduled Caste or Tribe) women.

Bar diagram 4.8



Source: NFHS-III (2005-06)

In Andhra Pradesh 90 (89.9) per cent women belonging to others category (non Other Backward Caste, non Scheduled Caste or Tribe) birth their babies in medical institutes. 72.0 per cent women among Other Backward Caste delivered in medical institutes in Andhra Pradesh. Women belonging to Scheduled Caste or Tribe have 61 (60.7) per cent institutional delivery. There are 29 (29.2) percentage differences in institutional delivery between others category (non Other Backward Caste, non Scheduled Caste or Tribe) women and Scheduled Caste or Tribe women.

There are 18 (17.9) percentage differences in institutional delivery between others category (non Other Backward Caste, non Scheduled Caste or Tribe) women and Other Backward Caste women. There are 11 (11.3) percentage differences in institutional delivery between Other Backward Caste women and Scheduled Caste or Tribe women.

There is high institutional delivery among others caste (non Other Backward Caste, non Scheduled Caste or Tribe) women. Other caste (non Other Backward Caste, non Scheduled Caste or Tribe) women have high institutional delivery in compare to Scheduled Caste or Tribe women in both states (Bihar and Andhra Pradesh).

Table- 4.7: Number of institutional delivery and non- institutional delivery by antenatal care (Bihar)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Days iron tablets/syrup taken						
Less than 90 or 90	144	**39.8**	218	**60.2**	362	100.0
More than 90	99	**77.3**	29	**22.7**	128	100.0
Total	243	**49.6**	247	**50.4**	490	100.0
Missing					1823	
Tetanus injection						
Received no injection	31	**10.1**	275	**89.9**	306	100.0
Less than 2 or 2	223	**33.0**	453	**67.0**	676	100.0
More than 2	162	**28.7**	403	**71.3**	565	100.0
Total	416	**26.9**	1131	**73.1**	1547	100.0
Missing					766	
Antenatal visit						
No antenatal visit	138	**14.4**	823	**85.6**	961	100.0
Less than 2 or 2	68	**26.5**	189	**73.5**	257	100.0
More than 2	211	**64.3**	117	**35.7**	328	100.0
Total	417	**27.0**	1129	**73.0**	1546	100.0
Missing					767	
Antenatal care						
Partially ANC	209	**46.1**	244	**53.9**	453	100.0
Fully ANC	38	**76.0**	12	**24.0**	50	100.0
Total	247	**49.1**	256	**50.9**	503	100.0
Missing					1810	

Source: Calculated from, NFHS-III (2005-06)

4.210 Antenatal care:

In Bihar women who have taken iron tablets or syrup less than three months have 40 (39.8) per cent institutional delivery. Women who have taken iron tablets or syrup more than three months have 77 (77.3) per cent institutional delivery. In Bihar 10 (10.1) per cent women who haven't received any tetanus injection delivered their babies in medical institutes. 33.0 per cent women who received tetanus injection two times or below, those women birth their babies in health institutes in Bihar. Women who received tetanus injection more than two times have 29 (28.7) per cent institutional delivery. In Bihar 14 (14.4) per cent women who don't go antenatal care, delivered their babies in medical institutes. 27 (26.5) per cent women who go antenatal care less than two times or two, have institutional delivery. Women who go antenatal care more than two times have 64 (64.3) per cent institutional delivery. In Bihar 46 (46.1) per cent women who have taken partially antenatal care delivered in health institutes. 76.0 per cent women who have taken fully antenatal care birth their babies in health institutes in the state of Bihar.

Table- 4.8: Number of institutional delivery and non- institutional delivery by antenatal care (Andhra Pradesh)

Variables	Institutional delivery		Non- institutional delivery		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Days iron tablets/syrup taken						
Less than 90 or 90	621	**75.6**	200	**24.4**	821	100.0
More than 90	406	**86.0**	66	**14.0**	472	100.0
Total	1027	**79.4**	266	**20.6**	1293	100.0
Missing					994	
Tetanus injection						
Received no injection	42	**46.2**	49	**53.8**	91	100.0
Less than 2 or 2	676	**77.6**	195	**22.4**	871	100.0
More than 2	523	**77.8**	149	**22.2**	672	100.0
Total	1241	**75.9**	393	**24.1**	1634	100.0
Missing					653	
Antenatal visit						
No antenatal visit	24	**30.4**	55	**69.6**	79	100.0
Less than 2 or 2	66	**55.5**	53	**44.5**	119	100.0
More than 2	1185	**80.1**	294	**19.9**	1479	100.0
Total	1275	**76.0**	402	**24.0**	1677	100.0
Missing					610	
Antenatal care						
Partially ANC	842	**77.9**	239	**22.1**	1081	100.0
Fully ANC	180	**87.8**	25	**12.2**	205	100.0
Total	1022	**79.5**	264	**20.5**	1286	100.0
Missing					1001	

Source: Calculated from, NFHS-III (2005-06)

In Andhra Pradesh women who have taken iron tablets or syrup less than three months have 76 (75.6) per cent institutional delivery. 86.0 per cent women who have taken iron tablets or syrup more than three months delivered their babies in health institutes. There is high institutional delivery among those women who have taken iron tablets or syrup more than three months. In Andhra Pradesh women who don't receive any tetanus injection among them 46 (46.2) per cent delivered their babies in health institutes. Women who have taken tetanus injection less than two or two times among them 78 (77.6) per cent delivered their babies in medical institutes. 78 (77.8) per cent women who have taken more than two tetanus injections have institutional delivery. In Andhra Pradesh women who don't visit antenatal care have 30 (30.4) per cent institutional delivery. Women who visit antenatal care less than two or two times 56 (55.5) per cent among them delivered in health institutes in the state of Andhra Pradesh. Women who visit antenatal care more than two times 80 (80.1) per cent give birth in medical institutes. In Andhra Pradesh women who have taken partially antenatal care 78 (77.9) per cent among them delivered their children in health institutes. Women who have taken fully antenatal care have 88 (87.8) per cent institutional delivery in the state of Andhra Pradesh.

There is high institutional delivery in both states (Bihar and Andhra Pradesh) among those women who have taken iron tablets or syrup for more than ninety days. Antenatal visit has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh). There are 50 (49.9) per cent differences in institutional delivery between those women who never visit antenatal care and those women who go antenatal care for more than two times in Bihar. There are 50 (49.7) per cent differences in institutional delivery between those women who never go antenatal care and who go antenatal care for more than two times in Andhra Pradesh. There is big difference in institutional delivery in both states between those women who never go antenatal care and who go antenatal care for more than two times. There are 38 (37.8) per cent differences in institutional delivery between those women who go antenatal care less than two or two times and who go antenatal care for more than two times in Bihar. There are 25 (24.6) per cent differences

in institutional delivery between those women who go antenatal care less than two or two times and who go antenatal care more than two times in Andhra Pradesh. Tetanus injection has good effect on institutional delivery in both states (Bihar and Andhra Pradesh). There are 30 (29.9) per cent differences in institutional delivery between those women who have taken antenatal care partially and who have taken antenatal care fully in Bihar. There are 10 (9.9) percentage differences in institutional delivery between those women who have taken antenatal care fully and who have taken antenatal care partially in Andhra Pradesh.

4.21 Comparison between Bihar and Andhra Pradesh (Bivariate analysis):-

4.211 Educational level:

There are 76.2 percentage differences in institutional delivery in Bihar between higher level of educated women and uneducated women. There are 46.4 percentage differences in institutional delivery in Andhra Pradesh between higher level of educated women and uneducated women. There are 63.6 percentage differences in institutional delivery in Bihar between higher level of educated women and primary level of educated women. There are 26.1 percentage differences in institutional delivery in Andhra Pradesh between higher level of educated women and primary level of educated women. There are 12.6 percentage differences in institutional delivery in Bihar between primary level of educated women and uneducated women. There are 20.3 percentage differences in institutional delivery in Andhra Pradesh between primary level of educated women and uneducated women. Higher level of education has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh).

4.212 Birth order:

There are 12.9 percentage differences in institutional delivery in Bihar between those women having first birth order and those having second to third birth order. There are 9.5 percentage differences in institutional delivery in Andhra Pradesh between those women having first birth order and those having second to third birth order. There are 26.8 percentage differences in institutional delivery in Bihar between those women having first birth order and those having fourth birth order or above. There are 18.1

percentage differences in institutional delivery in Andhra Pradesh between those women having first birth order and those having fourth birth order or above. There is high institutional delivery for first birth order in both states (Bihar and Andhra Pradesh).

4.213 Standard of living:

There are 49.3 per cent differences in institutional delivery in Bihar between high standard of living and low standard of living women. There are 38.6 per cent differences in institutional delivery in Andhra Pradesh between high standard of living and low standard of living women.

There are 37.7 per cent differences in institutional delivery in Bihar between high standard of living and medium standard of living women. There are 21.0 per cent differences in institutional delivery in Andhra Pradesh between high standard of living and medium standard of living women. There are 11.6 per cent differences in institutional delivery in Bihar between medium standard of living and low standard of living women. There are 17.6 per cent differences in institutional delivery in Andhra Pradesh between medium standard of living and low standard of living women. High standard of living has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh).

4.214 Age at marriage:

There are 44.1 per cent differences in institutional delivery in Bihar between those women whose age at marriage is below twenty years and those women whose age at marriage is twenty years or above. There are 17.6 per cent differences in institutional delivery in Andhra Pradesh between those women whose age at marriage is below twenty years and those women whose age at marriage is twenty years or above. There is high institutional delivery among those women whose age at marriage is above twenty years or twenty years in both states (Bihar and Andhra Pradesh).

4.215 Partner's educational level:

There are 54.6 per cent differences in institutional delivery in Bihar between those women whose spouses have higher level of education and those women whose spouses are uneducated. There are 37.8 per cent differences in institutional delivery in

Andhra Pradesh between those women whose spouses have higher level of education and those women whose spouses are uneducated. There are 55.2 per cent differences in institutional delivery in Bihar between those women whose spouses have higher level of education and those women whose spouses have primary level of education. There are 26.3 per cent differences in institutional delivery in Andhra Pradesh between those women whose spouses have primary level of education and those women whose spouses have higher level of education. There are 35.3 per cent differences in institutional delivery in Bihar between those women whose spouses have higher level of education and those women whose spouses have secondary level of education. There are 11.0 per cent differences in institutional delivery in Andhra Pradesh between those women whose spouses have higher level of education and those women whose spouses have secondary level of education. There are 19.3 per cent differences in institutional delivery in Bihar between those women whose spouses are uneducated and those women whose spouses have secondary level of education. There are 26.8 per cent differences in institutional delivery in Andhra Pradesh between those women whose spouses are uneducated and those women whose spouses have secondary level of education. There are 19.9 per cent differences in institutional delivery in Bihar between those women whose spouses have primary level of education and those women whose spouses have secondary level of education. There are 15.3 per cent differences in institutional delivery in Andhra Pradesh between those women whose spouses have primary level of education and those women whose spouses have secondary level of education. In both states (Bihar and Andhra Pradesh), partner's level of education has strong positive effect on institutional delivery.

4.216 Exposure to mass media:

There are 24.9 per cent differences in institutional delivery in Bihar between those women who expose to mass media (radio and television) and those don't expose to mass media (radio and television). There are 25.7 per cent differences in institutional delivery in Andhra Pradesh between those women who expose to mass media (radio and television) and those don't expose to mass media (radio and television). There is high institutional delivery where women have radio or television or both in Bihar and Andhra

Pradesh. Exposure to mass media increase simultaneously institutional delivery in both states, Bihar and Andhra Pradesh.

4.217 Place of residence:

There are 27.4 per cent differences in institutional delivery in Bihar between rural women and urban women. There are 30.8 per cent differences in institutional delivery in Andhra Pradesh between rural women and urban women. There is high institutional delivery among urban women in both states (Bihar and Andhra Pradesh).

4.218 Religion:

There are 17.1 per cent differences in institutional delivery in Bihar between Hindu women and non- Hindu women. There are 18.2 per cent differences in institutional delivery in Andhra Pradesh between Hindu women and non- Hindu women. There is high institutional delivery among Hindu women in Bihar. There is high institutional delivery among non- Hindu women in Andhra Pradesh. It shows that effect of religion on institutional delivery varies with one region to another region.

4.219 Caste or tribe:

There are 20.5 per cent differences in institutional delivery in Bihar between Scheduled Caste or Tribe women and other caste (non Other Backward Caste, Scheduled Caste or Tribe) women. There are 29.2 per cent differences in institutional delivery in Andhra Pradesh between Scheduled Caste or Tribe women and other caste (non Other Backward Caste, Scheduled Caste or Tribe) women. There are 9.7 per cent differences in institutional delivery in Bihar between Scheduled Caste or Scheduled Tribe women and Other Backward Caste women. There are 11.3 per cent differences in institutional delivery in Andhra Pradesh between Scheduled Caste or Tribe and Other Backward Caste women. Other caste (non Other Backward Caste, Scheduled Caste or Tribe) women have high institutional delivery in compare to Scheduled Caste or Tribe women in both states (Bihar and Andhra Pradesh). Higher caste women have high institutional delivery in compare to lower caste in both states (Bihar and Andhra Pradesh).

4.220 Antenatal care:

There is high institutional delivery in both states (Bihar and Andhra Pradesh) among those women who have taken iron tablets or syrup for more than ninety days. Antenatal visit has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh). There are 49.9 per cent differences in institutional delivery in Bihar between those women who never go antenatal care and those women who go antenatal care more than two times. There are 49.7 per cent differences in institutional delivery in Andhra Pradesh between those women who never go antenatal care and those women who go antenatal care more than two times. There is big difference in institutional delivery in both states between those women who never go antenatal care and those women who go antenatal care more than two times. There are 37.8 per cent differences in institutional delivery in Bihar between those women who go antenatal care less than two or two times and those women who go antenatal care more than two times. There are 24.6 per cent differences in institutional delivery in Andhra Pradesh between those women who go antenatal care for less than two or two times and those women who go antenatal care more than two times. Tetanus injection has good effect on institutional delivery in both states (Bihar and Andhra Pradesh).

There are 29.9 per cent differences in institutional delivery in Bihar between partially antenatal care taken women and fully antenatal care taken women. There are 9.9 per cent differences in institutional delivery in Andhra Pradesh between partially antenatal care taken women and fully antenatal care taken women.

4.3 Odds ratio (Logistic Regression):

Odds ratio is a measure of effect size, describing the strength of association or non independence between two binary data values. We used it used as a descriptive statistic and it plays an important role in logistic regression. An odds ratio greater than 1 indicates that the condition or event is more likely to occur in the first group. And an odds ratio less than 1 indicates that the condition or event is less likely to occur in the first group. We use odds ratio because it can be adjusted for confounding factors using logistic regression and it can be estimated from a case control study.[8]

[8] Oxford Medical School Gazette, Issue 55(1), 2008, OMSG Archive

Table- 4.9: Results of Binary Logistic Regression using nature of delivery (Bihar)

Variables	B	Significant	Exp(B)
Educational level		0.824	
Ref. No education			
Primary	-0.052	0.911	0.950
Secondary	0.219	0.637	1.245
Higher	0.739	0.396	2.093
Birth order		0.010	
Ref. First order			
2-3 order	-0.748	0.036*	0.473
4+	-1.112	0.003**	0.329
Standard of living index		0.004	
Ref. Low			
Medium	0.723	0.059*	2.060
High	1.804	0.001**	6.071
Age at marriage			
Ref. Below 20			
20+	0.228	0.635	1.257
Partner's educational level		0.649	
Ref. No education			
Primary	0.168	0.734	1.182
Secondary	-0.242	0.577	0.785
Higher	0.209	0.723	1.232
Exposure to mass media			
Ref. No			
Yes	-0.091	0.789	0.913
Type of place of residence			
Ref. Rural			
Urban	1.444	0.000***	4.239
Religion			
Ref. Non- Hindu			
Hindu	0.620	0.160	1.859
Type of caste or tribe		0.248	
Ref. Others			
OBC	-0.533	0.155	0.587
SC & ST	-0.089	0.869	0.914
Days iron tablets or syrups taken			
Ref. Less than 90 or 90			
More than 90	0.608	0.201	1.836
Tetanus injection		0.347	
Ref. Received no injection			
Less than 2 or 2	-0.235	0.695	0.791
More than 2	-0.646	0.297	0.524
Antenatal visit		0.005	
Ref. No antenatal visit			
Less than 2 or 2	0.298	0.437	1.347
More than 2	1.173	0.003	3.231
Antenatal care			
Ref. Partially ANC			
Fully ANC	-1.064	0.118	0.345
Constant	-1.380	0.063	0.252

Note:- *** Significant at 0.1%

** Significant at 1%

* Significant at 5%

Source: Calculated from, NFHS-III (2005-06)

4.31 Odds ratio (Bihar):

Birth order, standard of living and type of place of residence show significant effect on institutional delivery in Bihar. The institutional delivery is relatively high (odd ratio 4.24) in urban area compared to rural area after controlling all other factors in Bihar. Type of place of residence has very strong positive relationship with institutional delivery in Bihar. Odds ratio of urban women is more than four times higher institutional delivery as compare to rural women. Standard of living has strong positive relationship with institutional delivery in Bihar. Odds ratio of medium standard of living women is more than two times higher institutional delivery as compare to low standard of living. Odds ratio of high standard of living women is more than six times higher institutional delivery as compare to low standard of living women. After controlling all other factors the effect of standard of living of women shows that high standard of living women have higher institutional delivery (odd ratio 6.07) compared to low standard of living women.

Keeping all other variables constant institutional delivery is relatively high (odd ratio 2.06) in medium standard of living women compared to low standard of living women. Birth order has negative relationship with institutional delivery. The probability of death is higher among first birth order. When pregnant women go for first delivery, they fear from pregnancy complications. That's why institutional delivery is high in first birth order. Institutional delivery is relatively low (odd ratio 0.47) in second to third birth order compared to first birth order after controlling all other factors. Institutional delivery is relatively low (odd ratio 0.33) in fourth birth order or above compared to first birth order after controlling all other factors. Keeping others variables constant education level, age at marriage, partner's education level, exposure to mass media, religion, caste or tribe, iron tablets or syrup taken, tetanus injection, antenatal visit and antenatal care have not significant effect on institutional delivery in Bihar.

4.32 Odds ratio (Andhra Pradesh):

Education level, birth order, type of place of residence and type of caste or tribe show significant effect on institutional delivery in Andhra Pradesh. Education level shows very strong positive relationship with institutional delivery.

Table- 4.10: Results of Binary Logistic Regression using nature of delivery (Andhra Pradesh)

Variables	B	Significant	Exp(B)
Educational level		0.000	
Ref. No education			
Primary	0.569	0.021*	1.766
Secondary	1.305	0.000***	3.687
Higher	2.020	0.003**	7.542
Birth order		0.017	
Ref. First order			
2-3 order	-0.523	0.019*	0.593
4+	-0.818	0.010*	0.441
Standard of living index		0.398	
Ref. Low			
Medium	-0.004	0.987	0.996
High	0.335	0.317	1.397
Age at marriage			
Ref. Below 20			
20+	0.161	0.557	1.175
Partner's educational level		0.517	
Ref. No education			
Primary	0.406	0.145	1.501
Secondary	0.185	0.432	1.203
Higher	0.076	0.854	1.079
Exposure to mass media			
Ref. No			
Yes	0.147	0.505	1.159
Type of place of residence			
Ref. Rural			
Urban	1.206	0.000***	3.340
Religion			
Ref. Non- Hindu			
Hindu	-0.381	0.170	0.683
Type of caste or tribe		0.035	
Ref. Others			
OBC	-0.678	0.018*	0.508
SC & ST	-0.755	0.014*	0.470
Days iron tablets or syrups taken			
Ref. Less than 90 or 90			
More than 90	0.135	0.613	1.145
Tetanus injection		0.605	
Ref. Received no injection			
Less than 2 or 2	-0.576	0.394	0.562
More than 2	-0.666	0.329	0.514
Antenatal visit		0.001	
Ref. No antenatal visit			
Less than 2 or 2	0.503	0.427	1.654
More than 2	1.454	0.011	4.279
Antenatal care			
Ref. Partially ANC			
Fully ANC	0.342	0.389	1.407
Constant	0.154	0.864	1.166

Note: *** Significant at 0.1%

** Significant at 1%

* Significant at 5%

Source: Calculated from, NFHS-III (2005-06)

Keeping other variables constant the effect of educational level shows that the women with high level of education have higher institutional delivery (odd ratio 7.54) in comparison to uneducated women. Table 4.10 indicates that educational level increase simultaneously institutional delivery. Odds ratio of women having higher level of education is more than eight times higher institutional delivery as compare to illiterate women. After controlling all other variables institutional delivery is relatively high (odd ratio 3.69) in women of secondary level of education compared to uneducated women. Odds ratio of women having secondary level of education is more than four times higher institutional delivery as compare to uneducated women.

The institutional delivery is relatively high (odd ratio 1.77) in women of primary level of education compared to uneducated women. Odds ratio of women having primary level of education is more than two times higher institutional delivery as compare to illiterate women. Birth order has negative relationship with institutional delivery in Andhra Pradesh. The institutional delivery is very low in fourth birth order and above (odd ratio 0.44) compared to first birth order after controlling all other factors. Place of residence has strong positive effect with institutional delivery in Andhra Pradesh. The institutional delivery is relatively high (odd ratio 3.34) in urban area compared to rural area. Odds ratio of urban women is more than three times higher institutional delivery as compare to rural areas. The institutional delivery is relatively low (odd ratio 0.51) in other backward caste women compared to other caste (non- other backward caste, non-scheduled caste or non- scheduled tribe). The institutional delivery is relatively low (odd ratio 0.47) in scheduled caste or scheduled tribe women compared to others category (non- other backward caste, non- scheduled caste or non- scheduled tribe) after controlling all other variables.

After controlling all other factors standard of living, age at marriage of women, partner's educational level, exposure to mass media, religion, iron tablets or syrup taken, tetanus injection taken, antenatal visit and antenatal care haven't significant effect on institutional delivery in Andhra Pradesh.

4.33 Comparison:

In Bihar birth order, standard of living and place of residence have significant effect on institutional delivery. Keeping all other variables constant birth order has negative relationship with institutional delivery in Bihar. As birth order increases, institutional delivery decreases. Standard of living has strong positive relationship with institutional delivery in Bihar after controlling all other factors. As standard of living increases, institutional delivery increases.

Place of residence has positive relationship with institutional delivery in Bihar. Institutional delivery is relatively high in urban area compared to rural area in Bihar. In Andhra Pradesh educational level, birth order, place of residence and caste or tribe has significant effect on institutional delivery. Educational level has strong positive relationship with institutional delivery in Andhra Pradesh. As educational level of women increases, institutional delivery increases. Birth order has negative relationship with institutional delivery in Andhra Pradesh. As birth order increases, institutional delivery decreases in Andhra Pradesh. Place of residence has positive relationship with institutional delivery in Andhra Pradesh. Institutional delivery is relatively high in urban women compared to rural women keeping all other variables constant in Andhra Pradesh. Higher caste women have high institutional delivery compared to lower caste in Andhra Pradesh. Birth order and place of residence have significant effect in both states (Bihar and Andhra Pradesh). In the context of Bihar, standard of living of women is important variable for institutional delivery; while in Andhra Pradesh educational level of women is very important variable for institutional delivery. Birth order is important variable for institutional delivery in both states (Bihar and Andhra Pradesh). In Bihar economic variable plays important role for determining institutional delivery, while in Andhra Pradesh social variable plays important role for determining institutional delivery. Bihar could not get threshold of educational level. So, educational level has not significant effect on institutional delivery in Bihar. Andhra Pradesh has good educational level. So, effect of educational level shows on institutional delivery in Andhra Pradesh.

CHAPTER- FIVE

SUMMARY AND CONCLUSION

Chapter-5

Summary and Conclusion

5.1 Summary:

In India, as many as 300 women die everyday due to pregnancy and childbirth complications. Over 90 per cent of these deaths are preventable. According to the statistics realized by UNICEF, in India a woman dies every five minutes during childbirth. The extent of institutional deliveries in India varies widely across the states or union territories; from the lowest of 18-24 per cent in Nagaland, Chattisgarh, Jharkhand, Uttar Pradesh, Bihar and Uttarakhand to the highest of 86-98 per cent in Tamil Nadu, Goa, Pondicherry and Kerala. In Andhra Pradesh, Tripura and Jammu- Kashmir and in union territories of Daman Diu, Andaman and Nicobar Islands and Lakshadweep; 60 per cent or more deliveries take place in health institutions. On the other hand, in Assam, Madhya Pradesh, Meghalaya, Rajasthan, Orissa, Arunachal Pradesh and Haryana less than two- fifth of the deliveries are in health institutions.[9] The per cent of the institutional deliveries increases substantially with women's education and economic status, though the variation in the institutional deliveries by women's education is much conspicuous than that by women's economic status. Low income makes access to better medical facilities difficult and social customs and traditions make post natal care a taboo. Forty-seven per cent of maternal deaths in rural India are attributed to excessive bleeding and anemia resulting from poor nutritional practices. The complication of pregnancies and the births are found to be the leading causes of deaths and disability among women of reproductive age. At least one in 70 women faces risk of life during delivery.

The most common responsible causes of maternal deaths are hemorrhage (ante partum or post partum), eclampsia, pre- eclampsia, infection, obstructed and prolonged labor, complications of abortion, disorders related to high blood pressure and anaemia. Hemorrhage is the most important cause for maternal death during delivery in India. Bleeding is technically known as hemorrhaging. Physical, socio- cultural and economic barriers affect access to institutional health services. Women prefer home births and it is

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. [9] International Institute of Population Sciences (2006); *Reproductive and Child Health, DLHS-2, India, 2002-04*, Ministry of Health and Family Welfare, Government of India, New Delhi.

a cultural reality. It is important to focus attention on health of women during pregnancy and also after child birth (Bajpai, 2006). Levels of maternal mortality are indicative of social injustices between rich and poor people, urban and rural areas, men and women and not only of the quality of a functioning health care system. Inadequate access to maternity care is only one of the causes of maternal mortality. Institutional delivery is a critical factor in determining maternal deaths. The promotion of institutional deliveries has been emphasized for reduction of maternal and child health for improving maternal health in the country through RCH program. The cash assistance to pregnant women of BPL families under the Janani Suraksha Yojna is a welcome step for promoting the safe deliveries among the poor. Institutional delivery helps in improving the condition of maternal deaths and infant deaths. The likelihood of giving birth in medical institutions depends on many factors, including urban or rural residence, mother's demographic and socio- economic characteristics, availability and quality of health services. Institutional delivery is positively associated with mother's education, exposure to mass media and household standard living. Among rural mothers, literate mothers are much more likely to give birth in a medical institution than illiterate mothers. Promotion of maternal and child health has been one of the most important objectives of the family welfare programme in India.

Higher standard of living affected the choice between home and public/ private deliveries (Amardeep et al. 2008). Respondents with low and moderate standard of living have low institutional deliveries than respondent with high standard of living. Muslim mothers are more likely than Hindu mothers to give birth in a medical institution in Andhra Pradesh and Gujarat but Muslim mothers are much less likely than Hindu mothers to do so in Bihar and Rajasthan (NFHS-II, 1998-99). Receiving one or more antenatal check- ups is the strongest predictor of institutional delivery (NFHS-II, 1998-99). Mothers who receive antenatal check-ups are two to five times more likely to give birth in a medical institution than mothers, who did not receive antenatal check- ups (Sugathan et al. 2001). The effect of antenatal care on institutional delivery is larger in south India than in the north India and the predicted percentages receiving institutional delivery is higher in south India than in north India. Higher level of education influences the use of health services in several ways such as antenatal check- up, institutional

deliveries, consulting the doctors, contraceptive use and sexual health care. Education leads to better health awareness and this may sensitize the family to the quality of health care provided at various facilities (Amardeep et al. 2008). High levels of husband's education increase the likelihood of health service (American Journal of Public Health, 2006). Child birth order has strong effect on the likelihood of institutional delivery. The older mothers are less likely to give birth in a medical institution than younger mothers. Institutional delivery is higher for mothers who are regularly exposed to the electronic mass media than mothers who are not regularly exposed (NFHS-II, 1998-99). The women of Scheduled Caste (SC) and Scheduled Tribe (ST) had significantly lower proportions of institutional deliveries than women who belonged to other groups (Pandey, 2007).

The data source of this study is National Family Health Survey-III (NFHS-III, 2005-2006). The variables, which are used in this research work are- highest educational level, birth order, standard of living index, age at marriage (include married gauna performed), partner's educational level, exposure to mass media (has radio and has television), type of place of residence, religion, type of caste or tribe of household head, place of delivery, days iron tablets or syrup taken, tetanus injection taken before birth, antenatal visit for pregnancy and Antenatal care. The study areas of this research work are developing state (Bihar) and developed state (Andhra Pradesh) in India. The 25.3 per cent of the women has institutional delivery in Bihar according to National Family Health Survey-III (2005-06). The 75.8 per cent of the women has institutional delivery in Andhra Pradesh according to National Family Health Survey-III (2005-06). In this research work, we mainly use quantitative research methods- univariate analysis, bivariate analysis and binary logistic regression analysis. By the help of cross tabulation and binary logistic regression, we calculated respectively gross effect and net effect of selected variables [highest educational level, birth order, standard of living index, age at marriage (include married gauna performed), partner's educational level, exposure to mass media (has radio and has television), type of place of residence, religion, type of caste or tribe of household head, days iron tablets or syrup taken, tetanus injection taken before birth, antenatal visit for pregnancy and Antenatal care] on place of delivery in Bihar and Andhra Pradesh.

5.2 Conclusion:

Study of this research work shows that primary level of education has not strong effect on institutional delivery in comparison of higher level of education in Bihar and Andhra Pradesh. Higher level of education of husband has strong effect on institutional delivery in both states. As level of education increase, institutional delivery also increases in both states. High birth order is often associated with less prenatal care and less likelihood of institutional delivery in both states. Institutional delivery is higher among those women who exposed to mass media than those women who didn't expose to mass media in both states. Urban women have higher institutional delivery than rural women in Bihar and Andhra Pradesh. In Bihar institutional delivery is higher among Hindu women in comparison to non- Hindu women. There is high institutional delivery among non-Hindu women in the comparison of Hindu women in Andhra Pradesh. There is low institutional delivery among Scheduled Caste or Tribe women in comparison to Other Backward Class and other caste (non Other Backward Caste or non Scheduled Caste or Tribe) women. There is very high institutional delivery among those women whose age at marriage is twenty years or above in comparison to those women whose age at marriage is below twenty years in Bihar and Andhra Pradesh. There is high institutional delivery in both states (Bihar and Andhra Pradesh) among those women having taken iron tablets or syrup for more than ninety days. Antenatal visit has strong effect on institutional delivery in both states (Bihar and Andhra Pradesh). Tetanus injection has good effect on institutional delivery in both states (Bihar and Andhra Pradesh). There is high institutional delivery in both states (Bihar and Andhra Pradesh) among those women who received fully antenatal care.

Birth order, standard of living and type of place of residence show significant effect on institutional delivery in Bihar after controlling all other variables. Type of place of residence and Standard of living has very strong positive relationship with institutional delivery in Bihar. Education level, birth order, type of place of residence and type of caste or tribe show significant effect on institutional delivery in Andhra Pradesh. Education level, type of place of residence and type of caste or tribe have positive

relationship with institutional delivery in Andhra Pradesh. Birth order has negative relationship with institutional delivery in Bihar and Andhra Pradesh.

The national goals of the National Health Policy (2002) have been revised under the National Rural Health Mission (NRHM). The NRHM seeks to focus on 18 states which have weak public health infrastructure and indicators. Janani Suraksha Yojana (JSY) is a safe motherhood intervention under the NHRM with the objective of reducing maternal and neo- natal mortality by promoting institutional delivery and making available quality maternal care during pregnancy, delivery and immediate post delivery period with special focus on low performing states. ASHA, a village level health worker in 10 low performing states, namely the 8 EAG states and Assam and J &K will act as an effective link between the field level Government health provider and the poor pregnant women. Her main role would be to:

I. Identify pregnant woman from BPL families as a beneficiary of the scheme and report to the ANM for registration,

II. Assist the pregnant woman to obtain BPL certification if BPL card is not available,

III. Provide and / or help the women in receiving at least three ANC, two TT injection, IFA tablets,

IV. Counsel for institutional delivery,

V. Escort the beneficiary women to the pre-determined health center and stay with her till the woman is discharged,

VI. Post natal visits within 7 days of pregnancy and track mother's health,

Work of the ASHA should be assessed based on the number of pregnant women she has been able to motivate to deliver in a health institution. JSY, a 100 % centrally sponsored scheme integrates cash assistance with delivery and post-delivery care. The success of the scheme would be determined by increase in institutional delivery among the BPL families as well as the overall institutional delivery.

5.3 Suggestions for promotion of institutional delivery:

For promotion of institutional delivery, these following steps can be taken:

5.31 Place of residence:

Place of residence has very strong effect on place of delivery in both states (Bihar and Andhra Pradesh). It shows that facilities of health are very poor in rural areas compare to urban area in Bihar and Andhra Pradesh. Place of residence indicates urban amenities like health facilities are also important for determining institutional delivery. Urban areas have good access to modern transportation for institutional delivery in emergency period.[10] Rural women may be less inclined than even to seek maternity services owing to the rising costs of medical care.[11] Most of people in Bihar live in rural areas. There is low health infrastructure in rural areas in Bihar. So their access to health institute is low. That's why there is low institutional delivery in Bihar. At first, rural health infrastructure should be improved in Bihar. Maternity home should be opened in each village in Bihar. Quantity and quality of health facilities should be improved in rural areas and urban areas in Bihar. In Andhra Pradesh, there is also need to improve health facilities in rural areas.

5.32 Education level:

Education is a fundamental indicator of a country's level of human development. Education is one of the most important social factors. Education also enhances the ability of individuals to achieve desired demographic and health goals. Education increases awareness. But primary level of education has not significant effect on health care utility in compare to higher level of education. Higher level of female education resulted in a greater likelihood than women will practice contraception, receive antenatal care and give

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[10] Shehu D., A. T. Ikeh, M. J. Kuna (1997); 'Mobilising Transport for Obstetric Emergencies in North-Western Nigeria', *Int. J. Gynaecol. Obstet.*, Volume 59 (Suppl. 2), Page 173-80.

[11] Short Susan E. and Fengyu Zhang (2004); 'Use of Maternal Health Services in Rural China', *Population Studies*, Volume 58(1), Page 3-19.

birth in a medical institution.[12] Education of mother is an important social variable that has a positive bearing on utilization of maternal and child health services.

In Andhra Pradesh, education level has positive effect on institutional delivery but education level has not significant effect on institutional delivery in Bihar. Bihar has poor education level. Bihar could not get threshold of education level. That's why education level has not significant effect on institutional delivery in Bihar. Good quality of education should be given to people in Bihar. Mother's education gives power for taking decision in family. So we should give attention on improvement of female education in Bihar. Education about reproductive health and hygiene should give to all women (reproductive age group) and adolescence girls in Bihar. It increases awareness about maternal care and institutional delivery. More emphasis should be given on knowledge, attitude and practices (KAP) of poor people regarding maternal complications.

Most of women in Andhra Pradesh belong to secondary level of education. So, there is need to improve education level in Andhra Pradesh because highly educated women are more than seven times higher institutional delivery as compare to illiterate women.

5.33 Standard of living:

Standard of living is important economic determining factors for institutional delivery. Generally, it is shown in India; there is high expenditure on health in high income group people. Women from poor sections of the society are less likely to avail of maternal health care services than rich women.[13] Disparities in utilization of delivery care exist between rich and poor individuals as well as rich and poor states.[14] Poverty eradication programs should be worked properly in Bihar. Employment guarantee scheme should be fully active for rural poor and urban poor in Bihar. Economic empowerment is necessity for people of Bihar. There is positive relationship between economic background of women with level of institutional delivery and expenditure on

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[12] Stephenson R., A. O. Tsui (2002); 'Contextual Influences in Reproductive Health Service Use in Uttar Pradesh, India'; *Studies in Family Planning*, Volume 33, Number 4, Page 309-320.
[13] Salam Abdul; Socio- economic inequalities in use of delivery care services in India.
[14] Sudhakaran V. (2009); Institutional Deliveries- A Socio-economic and Cultural View.

delivery. It could be minimized by strengthening the public sector, where cost of delivery is relatively low.

5.34 Antenatal care:

Antenatal care helps women for safe pregnancy and ensures that the new born is in good health. Antenatal care play pivotal factor for the safe motherhood. Receiving one or more antenatal check ups is the strongest predictor of institutional delivery (NFHS-III). Mothers who receive antenatal check ups are two to five times more likely to give birth in a medical institute than mothers, who didn't receive antenatal check ups. The effect of antenatal care on institutional delivery is larger in southern India than in northern India and the predicted percentages receiving institutional delivery is higher in southern India than in northern India. A large amount of women have taken partially antenatal care in Andhra Pradesh. There is need to improve antenatal care facilities in both states Bihar and Andhra Pradesh. Antenatal check ups should be improved through maternal education, mass media and incentives in Bihar and Andhra Pradesh.

5.35 Communication:

We should establish linkage to hospital by emergency transport and good referral system of network in Bihar and Andhra Pradesh.

Thus Andhra Pradesh has low maternal death and high institutional delivery due to good socio-economic conditions. We can say that improvement of social and economic elements is essential for promotion of institutional delivery. Government should be attentive on social and economic development for good future in Bihar and Andhra Pradesh.

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