

**A COMPARATIVE STUDY ON MATERNAL HEALTH BETWEEN
KERALA AND UTTAR PRADESH**

**BY
KAVYA. T.J
(17PEC007)**

**THESIS SUBMITTED TO AVINASHILINGAM INSTITUTE FOR HOME
SCIENCE AND HIGHER EDUCATION FOR WOMEN
COIMBATORE – 641043**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE
DEGREE OF MASTER OF ARTS IN ECONOMICS**

APRIL 2019

**A COMPARATIVE STUDY ON MATERNAL HEALTH BETWEEN
KERALA AND UTTAR PRADESH**

**BY
KAVYA. T.J
(17PEC007)**

**A DISSERTATION SUBMITTED TO
AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER
EDUCATION FOR WOMEN
COIMBATORE – 641043**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE
DEGREE OF MASTER OF ARTS IN ECONOMICS**

APRIL 2019

CERTIFIED AS BONAFIDE RESEARCH WORK



**SIGNATURE FO THE
HEAD OF THE DEPARTMENT**



SIGNATURE OF THE GUIDE

ACKNOWLEDGEMENT

First and foremost the investigator places her humble salutations to the **God Almighty**, for showering immense blessings throughout her research work and for blessing her good health, strength and wisdom to complete the research successfully.

The investigator expresses her heartfelt thanks and deep sense of gratitude to **Padmashree Dr.P.R. Krishna Kumar, chancellor**, Avinashilingam Institute for Home Science And Higher Education for Women,Coimbatore,for providing the infrastructural facilities to conduct the research in this highly esteemed University.

The investigator records her sincere gratitude to **Dr.T.S.K.Meenakshi Sundaram**, Managing Trustee and Former Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Sri Avinashilingam Education Trust Institutions, Coimbatore, for the smooth conduct of the study.

The investigator owes her special thanks and gratitude to **Dr. (Tmt) Premavathy Vijayan**, Vice Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for providing all the help for the smooth accomplishment of the study.

The investigator records her sincere gratitude to **Dr. (Tmt) S.Kowsalya** Registrar, Avinashilingam Institute for Home science and Higher Education for Women, Coimbatore, for providing all help in the smooth conduct of the study.

The investigator owes her heartfelt thanks and deep dense of gratitude to **Dr. (Mrs.) K.T.Geetha MA; M.Phil; Ph.D;** Dean, Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her kind support and encouragement for the conduct of the study.

The investigator expresses her special thanks and sincere gratitude to **Dr. (Mrs.) M.Manonmani** ,Professor and Head, Department of Economics, Avinashilingam Institute for Home Science and Higher Education for Women,Coimbatore,for her very valuable comments, special interest, knowledge and the right guidance she provided to complete the study.

The investigator is extremely fortunate and grateful to her guide to **Dr. (Mrs.) Sherly Thomas** Department of Economics, Avinashilingam Institute for Home science and Higher Education for Women, Coimbatore, for her patient guidance, meticulous care, encouragement, support and motivation right from the selection of the topic to compilation and completion of this work.

The researcher owes heartfelt thanks and gratitude to the **Librarians**, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore.

Finally, the investigator owes her profound gratitude to her **Parents and to her Grandparents** for providing her with unfailing support and continuous encouragement throughout the period of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without them.

She expresses her thanks to her **Friends** for their support and care which helped to overcome setbacks and stay focused on the study.

CONTENTS

CHAPTER NO	TITLE	PAGE NO
1.	Introduction	1
2.	Review of Literature	16
3.	Methodology	40
4.	Results and Discussions	43
5.	Summary and Conclusions	68
	Bibliography	71

LIST OF TABLES

Table No	Title	Page No.
1	Maternal mortality rate	5
2	Maternal mortality Ratio (MMR) India, EAG & Assam, South and Other states	8
3	Causes of Maternal Deaths	9
4	Socio-economic background	45
5	Total Fertility Rate by level of Education of women, India and Bigger states	49
6	Antenatal care	51
7	Delivery care	62
8	Postnatal care	66

LIST OF FIGURES

Figure No	Figures	Page No
1	Status of MMR – India and major States	7
2	Approximate Number of Maternal Deaths per year	9
3	Antenatal care	53
4	Four or more Antenatal care visits by district in Uttar Pradesh	54
5	Four or more Antenatal care visits by District in Kerala	56
6	Antenatal care vary with schooling	57
7	Delivery care in Uttar Pradesh	58
8	Institutional Delivery in Uttar Pradesh	60
9	Delivery care in Kerala	64

CHAPTER-I

INTRODUCTION

Health is an important dimension of well-being. Health is a universal human aspiration and a basic human need. The status of health is an important indicator reflecting social development and the quality of human life. Further, health care is one of the most basic human rights, vital for preservation and promotion of health. Health is an important determinant of economic and social development, because ill-health creates vicious circle by depleting human energy, leading to low productivity and earning capacity; deteriorating quality and quantity of consumption and standard of living. Health is regarded as an important component for sustained development interventions at the individual, community and national levels. Good health plays a sustained role in economic growth. Economic growth and development affect the health of the people by increasing their level of income, and hence in the consumption of goods and services. It means, there is a positive contribution to economic development which in turns tends to improve the health status of the population in a country. In developed countries, the health status is far higher than that of developing countries. Quality of life and health services are also different among these countries. India being a developing country health facilities are quite inadequate, both in rural and urban areas. (WHO, 2000).

Health, as defined by the World Health Organization (WHO), is “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. “This definition has been subject to controversy, as it may have limited value for implementation. Health may be defined as the ability to adapt and manage physical, mental and social challenges throughout life. Good Health confers on a person or groups “freedom from illness – and the ability to realize one’s potential. The health of populations is a distinct key issue in public policy discourse in every mature society often determining the deployment of huge society. They include its cultural understanding of ill health and well-being, extent of socio-economic disparities, reach of health services and quality and costs of care.

“Health is one of the goods of life to which man has a right; wherever this concept prevails the logical sequence is to make all measures for the protection and restoration of health to all.”

Health Status of people

Improvement in the health status of people are linked to number of factors such as household income, public expenditure on healthcare delivery system, availability of private healthcare facilities and general environmental conditions affecting incidence of diseases. Health status is assumed to affect utility directly by the value that individual place on good health and indirectly through increasing healthy time and hence labour income. With rising income levels, the households are able to spend on better healthcare, education and nutrition leading to an improvement in health status.

Maternal Health

Maternal health is an important aspect for the development of any country. The survival and well-being of mothers is not only important in their own right but are also central to solving large broader, economic, social and developmental challenges.

The maternal health refers to the health of women during pregnancy, childbirth and postpartum period. Due to complications during pregnancy or childbirth more than 350,000 women die annually. Among these almost, 99 percent death was in developing countries. The decline rate of maternal mortality is very slow, but the annual decline required rate is 5.5 percent to meet the MDG target of reducing by three-quarters the maternal mortality ratio by 2015 (MDG fact sheet,2010).Maternal health care services are the initiatives to ensure safe motherhood through promotive,preventive,curative and rehabilitative health care system. The topic maternal health-related issues become enlightened after International Conference on Population and Development (ICPD) in 1994, due to very high maternal mortality ratio in developing countries. The aim of maternal health services in reducing infant and maternal morbidity and mortality received increasing recognition and efforts are taken to focus on the availability, accessibility and organization of services. The government of India launched many maternal health care programmes to reduce pregnancy and childbirth complication and maternal death. But unfortunately, the country is far away to reach the millennium development goal till the recent years.

Indicators of Maternal health

The following are few indicators of maternal health:

- Maternal Mortality Rate (MMR)

- Antenatal care (ANC)
- Delivery care
- Postnatal care (PNC)

Maternal mortality rate (MMR)

Maternal mortality rate (MMR) is defined as death of a women from any cause related or aggravated by pregnancy while pregnant or within 42 days of termination of pregnancy. It is calculated as number of maternal deaths per 1 lakh live births during a given period.

The maternal mortality ratio (MMR) as the number of maternal deaths during a given period per 100,000 live births during the same period. For 2010–12, India's MMR was estimated at 178 maternal deaths per 100,000 live births (RGI 2013). In 2010, 19 per cent of the 287,000 maternal deaths estimated worldwide took place in India (WHO 2012). Such a high incidence of maternal mortality causes huge losses of human life and social welfare. Therefore, reducing MMR faster is a fundamental national and international concern (GoI 2011; UN 2000; Souza et al. 2013; WHO 2012; World Bank 2012). The level of MMR could be reduced in a relatively short time by scaling up proven clinical interventions and improving access to primary and referral delivery care (JahnandDe Brouwere 2001).

Maternal deaths can be further sub-divided into direct and indirect maternal deaths: direct maternal deaths are those due to obstetric complications of pregnancy (including delivery and 42 days postpartum), while indirect maternal deaths are those linked to other diseases or conditions when aggravated by the physiological effects of pregnancy.

Maternal mortality is affected by a range of socioeconomic and cultural factors, such as women's status in the household and society, their educational and economic status, accessibility facility (distance, transport) and availability and quality of care (availability of staff and equipment in the health facility) (Singh et al., 2011).

MMR – a global scenario (Developed and developing countries)

Maternal health is in a deplorable condition in India with a high MMR of 190 while in the developed countries; MMR is only 8 in United Kingdom, 6 in Switzerland, 7 in Germany, 9 in France, and 6 in Japan. The developing countries like Sri Lanka and China

also have a good maternal health condition as compared to India. Sri Lanka and China have only 29 and 32 MMR respectively. IMR, U5MR, NNM of India are 52.7, 41.4, 29.2 per thousand live births respectively, while these figure are 3.9, 3.2, and 2.2 in Germany, 2.9, 2.1, and 1 in Japan and 127, 10.9, and 7.7 in China, 9.6, 8.2, and 5.9 in Sri Lanka. It proves that these figures can be achieved by better healthcare services in both types of countries- developed and developing. Health status measured in terms of Life Expectancy at Birth (LEB) is an indicator of how one can be expected to live. In India the LEB for female is very low, and it is much higher in developed and in some developing countries. It is evident that there is a gap of 19 years between the best performing country, Japan (87 years) and India 68 years in 2013. India is among the worst performing countries in terms of LEB for Female. LEB in India is 68 years while it is 85 years in Switzerland, 83 years in United Kingdom, 81 years in U.S.A., 84 Years in Canada, 77 years in China, 87 years in Japan. India is lagging behind Sri Lanka (78 years), Indonesia (73 years), and Nepal (70 years). The births attended by skilled health personnel stands at almost 100 percent in all the developed and in some developing countries of the world. While in India only 66 per cent of births are assisted by health personnel, in Sri Lanka it is 99 per cent, 100 per cent in China, and 83 percent in Indonesia. India is only better than some of developing countries such as Nepal (35%), Pakistan (52%), and Bangladesh (44%). The same is also true in case of antenatal care of at least one visit and four visit. India has only 75% and 72% of 1-visit and 4-visit of ANCs respectively. India is better only with respect to the least developed countries such as Nepal (58%, 50%) and Bangladesh (59%, 25%) respectively.

The following table gives an account of MMR in different states over the past 10 years:

Table 1**Maternal Mortality Ratio (MMR) (per 100000 live births)**

Maternal Mortality Ratio: India, EAG& Assam, Southern States and Other States (per 100000 live births)	2004-06	2007-09	2010-12	2011-13	2014-16
India Total	254	212	178	167	130
Assam	480	390	328	300	237
Bihar/Jharkhand	312	261	219	208	165
Madhya Pradesh/ Chhattisgarh	335	269	230	221	173
Odisha	303	258	235	222	180
Rajasthan	388	318	255	244	199
Uttar Pradesh/Uttarakhand	440	359	292	285	201
EAG & Assam Subtotal	375	308	257	246	188
Andhra Pradesh	154	134	110	92	74
Telangana					81
Karnataka	213	178	144	133	108
Kerala	95	81	66	61	46
Tamil Nadu	111	97	90	79	66
South Subtotal	149	127	105	93	77
Gujarat	160	148	122	112	91
Haryana	186	153	146	127	101
Maharashtra	130	104	87	68	61
Punjab	192	172	155	141	122
West Bengal	141	145	117	113	101
Other States	206	160	136	126	97
Other Subtotal	174	149	127	115	93

Source: SSR 2012

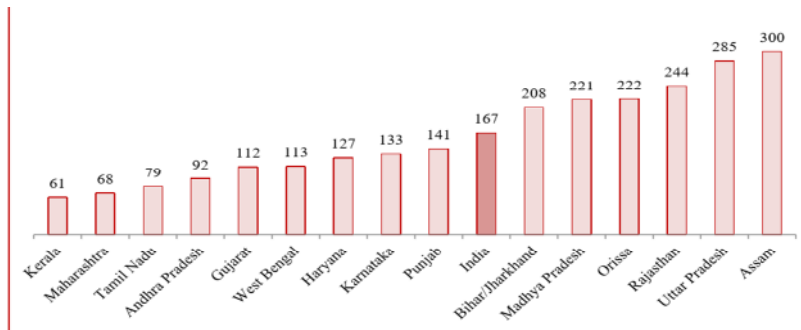
The table shows an overall reduction in MMR from 212 in 2007-09 to 178 in 2012. The rate further declined to 167 in 2011-13 and 2014-16. Over 67,000 women in India continue to lose their lives due to pregnancy related causes every year. Maternal healthcare condition is worst in Uttar Pradesh where the highest maternal mortality rate (440) was recorded in 2004-06 which subsequently reduced to 359 in 2007-09. In 2014-16 a considerable reduction in MMR to 201 took place in Uttar Pradesh. Uttar Pradesh has been replaced by Assam as the state with the highest number of maternal deaths in India. Kerala remains at the first rank in terms of maternal health care. The maternal mortality rate in Kerala recorded 46 in 2014-16, the lowest among all the major states in India. The table showed a great divide between northern and southern states; difference in maternal mortality is almost five times between the best performing state, Kerala (46) and worst performing state, Assam (237). Kerala is followed by Maharashtra (61), Tamilnadu (66), and Andhra Pradesh (74). On the other hand northern states counted MMR above the national average of 237 in Assam, 201 in Uttar Pradesh, 199 in Rajasthan, 180 in Odisha, 173 in Madhya Pradesh and 165 in Bihar. Despite a substantial reduction in maternal deaths in India, the proportion of adolescent deaths due to pregnancy related causes is alarmingly high.

Performance of States in Reducing MMR

Among the major States, the MMR ranges from 61 in Kerala to 300 in Assam in 2011-13. In the States of Bihar/ Jharkhand (208), Madhya Pradesh / Chhattisgarh (221), Orissa (222), Rajasthan (244), Uttar Pradesh / Uttarakhand (285) and Assam (300), the MMR estimates were reportedly higher than the estimates at all India level (167). Four States i.e. Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan together contribute to 67 per cent of MMR in the country.

Fig 1

Status of MMR – India and major States



Source: SRS 2011-13

In order to better understand the maternal mortality situation in India and to map the changes that have taken place especially at the regional level, the ORGI has categorised the states into three Groups namely ‘Empowered Action Group’ (EAG) states comprising Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Orissa, Rajasthan, Uttar Pradesh, Uttarakhand and Assam. ‘Southern’ States which include Andhra Pradesh, Karnataka, Kerala and Tamil Nadu and the ‘other’ States covering the remaining states. The region-wise trend in MMR during the 2004-13 is presented in Table 2.

Table: 2

Maternal mortality Ratio (MMR) India, EAG & Assam, South and Other states

	2004-06	2007-09	2010-12	2011-13	% of change during 2004-13
India Total	254	212	178	167	-34.25
EAG AND ASSAM	375	308	257	246	-34.40
SOUTH	149	127	105	93	-37.58
OTHER	174	149	127	115	-33.91

Source: SRS 2004-06 to 2011-13

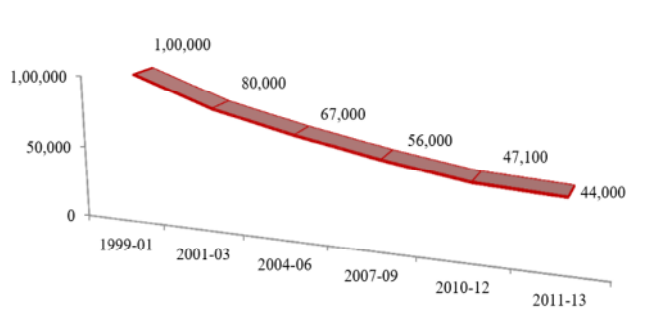
During 2004-13, among the States, Maharashtra (47.69%) has reported the highest percentage of decline in MMR whereas the percentage of decline was lowest in West Bengal (19.86%). While the States of Kerala, Maharashtra and Tamil Nadu have already achieved the national target of MMR and the present status of Gujarat, Andhra Pradesh and West Bengal are very close to the national level target. A comparison of the performance of the state-wise targets will give a meaningful impression of the extent of progress achieved by the individual States.

Maternal death in India

In India, pregnancy related deaths of women have declined over the years. The number of maternal deaths per year has come down from approximately 1, 00,000 deaths (1991-01) to 44,000 deaths in 2011-13 (Fig. 2). Though, more than 50 per cent reduction has been registered in the approximate number of maternal deaths in the last two decades, the present status shows that, even now, 120 women die of causes associated with pregnancy, in a day, in India.

Fig 2

Approximate Number of Maternal Deaths per year, SRS (1990-2013)



Source: Ministry of Health and Family Welfare

Causes of Maternal Death

Estimates of causes of maternal death have been more reliably studied among the 2001-2003 Special Survey of Deaths (Table 2) as this survey, among the five surveys held in the domain of SRS during 1997-2003, had a strict quality control on the causes of deaths consequent to the involvement of two independent physicians. As per the Special Survey of Deaths, the leading cause of death is haemorrhage (38%), followed by sepsis (11%), and abortion (8%). The patterns are similar in all the three categories namely 'EAG states and Assam', 'Southern' and 'Others', except that 'hypertensive disorders' and 'abortion deaths' are more in the category 'Southern' and 'EAG states and Assam' respectively.

Table 3

Causes of Maternal Deaths from 2001-03

Maternal causes	India	EAG & Assam	South	Other
Haemorrhage	38	37	30	40
Sepsis	11	11	17	10
Hypertensive disorders	5	4	13	6
Obstructed labour	5	5	9	4
Abortion	8	10	4	3
Other conditions	34	33	26	37

Source: Special survey of Death

Antenatal care

Antenatal care is the care given to mothers during their pregnancies so that they may have a safe delivery and a healthy baby. Antenatal care is considered as a back bone of obstetrical services of any health care delivery system. ANC also helps in reducing the complications during labor, neonatal period, postpartum period. Antenatal care has well established and recognised role by the pregnant patients in developed countries. In developing countries its importance is not well established and hence leads to poor attendance of antenatal clinics by the pregnant patient. Thus Antenatal care (ANC) refers to the healthcare during the pregnancy by a health professional in a healthcare centre or at a home. Almost 90% of maternal deaths occur in developing countries and over half a million women die each year due to pregnancy and childbirth related causes (Carroli,G.et.al.2001).ANC can contribute significantly in reducing the complications that may arise during pregnancy and childbirth because of dual effect of ANCs.ANCs include haemoglobin and blood pressure measurement, correction of anaemia; diagnose sexually transmitted diseases and urinary tract infections (Ministry of Health and Family Welfare,2005).

According to National Demographic study of Pakistan, 70% of women do not get antenatal care, 23% get antenatal care by doctors, 3% by nurse, lady health visitors or family social worker and 4% by trained or untrained traditional birth attendant (National Demographic Survey of Pakistan. Islamabad, Government of Pakistan. 1990-91). Antenatal care is 'care before birth' to promote wellbeing of mother and foetus. Ideally, antenatal care should monitor a pregnancy for signs of complications, detect and treat pre-existing and concurrent problems of pregnancy, and provide advice and counselling on preventive care, diet during pregnancy, delivery care, postnatal care, and related issues. Main aim of antenatal care is to reduce maternal morbidity, mortality, low birth weight & perinatal mortality and morbidities. All pregnant women should have adequate antenatal care irrespective of their social, economic, cultural and geographical background. The number of antenatal care visits and the timing of the first visit are important for the health of the mother and the outcome of the pregnancy. WHO recommends a minimum of four antenatal visits, comprising interventions such as tetanus toxoid vaccination, screening and treatment for infections, and identification of warning signs during pregnancy.

Delivery care

Another important indicator of maternal and child healthcare is the place of delivery, with proper hygienic conditions under the guidance of trained medical health personnel. India is a land which is bound by many traditions and customs, almost 30 percent of the deliveries takes place at home assisted by the local traditional healthcare personnel called “Dai”. The prevalence of illiteracy has also contributed significantly towards preference for home deliveries. The deliveries are assisted by Dais or female members of the family, in most unhygienic conditions. Home deliveries leads to various complications at the time of birthing; consequently the health of the mother and new born is compromised, resulting in low-weight and premature babies. Studies have shown that institutional deliveries or deliveries assisted by trained health personnel can eliminate or reduce the extent of mortality of either or both (Mother and Child).

The problem of institutional deliveries is more intensive in rural areas of the country as compared with the urban areas. In rural areas there is no perfect referral system at nearby places, or women have to travel long distance for healthcare centres where deliveries can take place. The problem of institutional deliveries is more intensive in rural areas of the country as compared with the urban areas. In rural areas there is no perfect referral system at nearby places, or women have to travel long distance for healthcare centres where deliveries can take place.

The first priority of delivery care is that it should be safe and clean (WHO, 1992). As with the case of institutional deliveries there is great inter-state diversity in case of safe delivery also. As per RSoC 2013-14 data safe deliveries in less developed states such as, Uttar Pradesh and Bihar have very low percentage as compared to other developed states.

The problem of safe deliveries is much more in rural areas than in urban areas of the country. In rural areas there are no specialized health personnel and existing healthcare infrastructure are ill equipped with other resources such as operation theater, labor room, adequate number of beds, effective referral system etc. (Rural Health Statistics, 2013). Result of safe deliveries is seen directly in maternal and newborn health status. The maternal mortality rate (MMR) and infant mortality rate (IMR) are continuously declining. It is evident that the states which recorded lowest safe delivery are pockets of high MMR and IMR. The government of India and other states government have expressed serious concern over the issue of high MMR and IMR, and taken various Initiatives towards

improvement of maternal and child health. Janani Suraksha Yojana (JSY) launched by UPA government for instance emphasizes 'high focus' states under the well implemented health programme 'National Rural Health Mission' documents to increase institutional/safe deliveries but by cash assistance.

Postnatal care

Postnatal care is the care received women after birthing. The 48 hours after the delivery is very sensitive for many bacterial and organism infection and critical for the new born and maternal survival. Checkups for mother and child in the two months after birth are also seen as important by health care professionals, particularly when deliveries do not take place in a health facility. The majority of maternal deaths take place after delivery, most of them within 24 hours after childbirth. Postpartum care allows health workers to detect and manage problems and to make sure mother and child are doing well (Biswas R. 2003). PNC the basic care for all newborn include curative and primitive healthcare; promote early and exclusive breastfeeding, keeping the newborn warm, providing safe and hygienic umbilical cord and counseling when to take newborn to the healthcare centre.

Government programmes

JANANI SURAKSHA YOJANA (JSY)

Janani Suraksha Yojana (JSY) is a safe motherhood intervention under National Health Mission (NHM), being implemented with the objective to reduce maternal and neonatal mortality by promoting institutional delivery among pregnant women. JSY is a centrally sponsored scheme which integrates cash assistance with delivery and post-delivery care. The Yojana has identified Accredited Social Health Activist (ASHA) as an effective link between the Government and pregnant women.

PRADHAN MANTRI SURAKSHIT MATRITVA ABHIYAN (PMSMA)

The Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) has been launched by the Ministry of Health & Family Welfare (MoHFW) in June, 2016. Under PMSMA, all pregnant women in the country are provided fixed day, free of cost assured and quality Antenatal Care. As part of the campaign, a minimum package of antenatal care services (including investigations and drugs) is being provided to the beneficiaries on the 9th day of every month. The Abhiyan also involves Private sector's health care providers as

volunteers to provide specialist care in Government facilities. So far, over 1 crore ANC checkups were conducted by over 4,800 volunteers in over 12,800 Government facilities. Also more than 5.62 lakh high risk pregnancy cases were identified across the country.

RASHTRIYA KISHOR SWASTHYA KARYAKRAM (RKSK)

About 25.3 crore adolescents in the age group 10-19 years in India are in a transient phase of life requiring nutrition, education, counseling and guidance to ensure their development into healthy adults. Considering the magnitude of various health problems and risk factors among adolescents, which may have an impact on maternal and child health outcomes and occurrence of non-communicable disease in future, RKSK was launched with the objectives: a. to increase the awareness and access to information about adolescent health, b. provision of counseling and health services, c. provision of specific services such as sanitary napkins; iron and folic acid supplementation. 3.7.1 Interventions under Rashtriya Kishor Swasthya Karyakram (RKSK) Adolescent Friendly Health Clinics (AFHCs): The intervention is implemented through establishment.

Maternal Health Care

Providing the best possible maternal health care has been a key concern on which most government programmes have been associated, be it family planning, child survival, safe motherhood, and reproductive and child health, the national population policy (2000), and NRHM (2005-12). With the launch of these programmes, the government has shown its commitment to providing quality health care services and improving maternal morbidity and mortality levels in the country.

Need for the study

India contributes one-fifth of the global burden of absolute maternal deaths; however, it has experienced an estimated 4.7% annual decline in maternal mortality ratio (MMR) [RGI (2006), WHO (2012)], and 3.5% annual increase in skilled birth attendance since 1990 [RGI (2006), IIPS (2010)]. While not on track to meet Millennium Development Goal number 5, India is making progress in reducing maternal mortality [WHO, 2012]. Within India, there is marked variation in MMR and healthcare access between regions and in socioeconomic factors [IIPS (2010), Barros AJD (2012)]. Understanding the distribution related to cause-specific mortality, and access to obstetric service indicators

(routine skilled birth attendance and emergency obstetric care) is essential to improve maternal health

Death of mother is a tragic event. In practical life, it has a severe impact on the family, community and eventually, the nation. Reduction of maternal mortality is the objective of MDGs, especially in low-income countries, where 1 in 16 women die of pregnancy-related complications. [Gurina (2006)].

Maternal deaths are a significant cause of death in women in the 15–49 years age group, and they make up a larger proportion of all-cause deaths in the rural areas of poorer states, compared to other regions of India.

Reduction in India's maternal mortality rate would make an important contribution to the worldwide reduction of maternal mortality. Our analysis presents the important local variations from global characteristics of maternal mortality as well as the substantial internal variations within India. For policy-makers, faced with constrained budgets but committed to India's goal of effectively addressing a relatively rare yet highly important health priority, these variations may provide some targets for intensifying or initiating maternal health interventions. As maternal mortality is an unpleasant event for the family and the society and it can be prevented in many cases, regular check of cause of mortality in this group is clear to take adequate measures.

Maternal mortality is an indicator of the quality of obstetric care in a community, directly reflecting the utilization of healthcare services available.[Mukherjee (2014)] One of the most important goals of the MDGs is to reduce the maternal mortality MMR has not been estimated at state level in most of the studies.⁷ Decentralized district-based health planning is essential in India because of the large inter-district variations. In the absence of vital data at the district level, the state level estimates are being used for formulating district level plans as well as setting the milestones thereof. In the process, the hotspots (districts requiring special attention) very often get masked by the state average.

Maternal mortality has been identified as a priority on health policy and research agendas for developing countries. It has gained increased recognition over the past two decades, due to its inclusion as a key target indicator in a number of international conferences, such as the 1990 World summit for children, the 1994 international conference on population and development and the 1995 World conference for women.³ However, the inclusion of improved maternal health as the fifth United Nations(UN)

millennium development goal (MDG) in 2000, and specifying a reduction of three quarters in the maternal mortality ratio between 1990 and 2015 as the primary target of MDG has given thrust on governments to have proper systems to measure maternal mortality.^{4,5} India has high commitment to millennium development goal. With this background the current study “A comparative study on Maternal Health between Kerala and Uttar Pradesh” was taken up with the following objectives.

Objectives:

- To study the select social background of women in the selected states of Kerala and Uttar Pradesh.
- To assess the indicators of maternal health in women in terms of Antenatal care, Delivery, Postnatal care in the selected states.
- To suggest measures to improve the maternal health.

CHAPTER – II

REVIEW OF LITERATURE

The literature review relating to the current study “A comparative study on maternal health between Kerala and Uttar Pradesh. “is discussed under the following classification

- **Determinants of maternal health**
- **Trends in maternal health**
- **Utilisation of maternal health care services**
- **Related studies**

Mothers play a vital role in economic development. Mother’s care during pregnancy has a direct influence on the development of children and it depends on their socio-economic and cultural factors. Among the poor, both in rural and urban area, delivery and child birth are fraught with risk. The emerging market driven health care system in India does not provide solutions for the poor and high risk segments of the population. The so far studies about the perception, importance, accessibility, trends, problems and issues related to maternal and child health care service utilization among the poor and the general give the clear picture about the health conditions of mothers and children as a whole.

Determinants of maternal health

According to WHO, “Maternal mortality is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes” (www.cahr.info, 2008). There are numerous signs to point out that the ignorant of health needs of women especially that of the expectant women, teenager girls and girl-child are responsible for the present high infant mortality rate (IMR), child mortality rate (CMR), and maternal mortality rate (MMR). The MMR is the number of maternal deaths per 1, 00,000 live births in one year. “Every minute of every day, somewhere in the world and most often in a developing country, a woman dies from complications related to pregnancy or childbirth. According to WHO, UNICEF, UNFPA and the World Bank, there were about 358,000 maternal deaths throughout the world during 2008”. (WHO, 2010)⁵ Of the total estimated maternal deaths, developing countries accounted for 99% maternal deaths and with 63,000 cases in the year 2008, India has the largest number of maternal deaths in the world. (WHO, 2007)⁶

Though the maternal mortality rate declined in India from 254 per lakh in 2004–2006 to 178 in 2010-12 it is still far from the United Nations mandated Millennium Development Goal (MDG).

Anwar et.al (2013) aimed to determine the effect of maternal education on child nutritional status in Bangladesh. The study has used 2007 Bangladesh Demographic and Health Survey (BDHS) data for the analysis. The study has employed various pathway measures linking maternal education and child nutritional status in Bangladesh. Result inferred socioeconomic status and attitude towards modern health care services are the most important pathways linking both. Health knowledge and reproductive behaviour describe some of the effect of mother's education on child nutrition.

Chandraleka (2013) examined the determinants of maternal mortality rate in Tamilnadu. The data was collected from Directorate of Family Welfare, Tamil Nadu during 2010. The study found that only 0.9% of the women did not receive antenatal check-up during pregnancy period in Tamilnadu, With regard to TT vaccination and IFA tablets, 1.3% and 7.5% of the women did not receive TT injection and IFA tablets in Tamilnadu.

Datta et.al (2012) studies of focused on the problem of maternal mortality in India. The authors stated that early age of marriage among women, early age of pregnancy, high birth rates, and less spacing between two deliveries are some social factors which cause increase in maternal mortality ratio. Beside these, high rate of malnutrition among women is also considered to be a social problem. On the other hand, medical conditions, like ante-partum haemorrhage, post-partum haemorrhage, anaemia, eclampsia, ectopic pregnancy, rupture uterus also form a significant proportion of maternal mortality.

Jose et.al (2014) in her study focused on the factors contributing to better coverage of maternal care services among the tribal women in Kerala. The determinants of utilization in tribal women were general awareness, affordability, accessibility and quality of services along with motivation by health workers. Among tribal women, 85% utilized maternal health care facilities compared to 100% among non-tribal women. Lower levels of education and lack of transport facilities were prime factors contributing to underutilization by tribal women. It concluded that Affordable, accessible and good

quality of services in the public health system in Kerala and motivation by health workers were important factors contributing for better utilization of maternal care services.

Healthy lifestyle and high intake of nutritious food can provide good health throughout life to the humans stated **Kowsalya et.al (2017)**. The poor nutrition and unawareness on the utilization of health facilities during their childhood and reproductive age are the major factors responsible for the high maternal mortality. The study found that though government of India has been taking several efforts to improve the health status of the women, poverty, gender discrimination and illiteracy are the major problems associated with lack of appropriate interventions.

Muzaffar et.al (2015) this paper locates the status of maternal health in Jammu and Kashmir, the northernmost state of India and identifies the social determinants of maternal health. This work is based on the secondary sources in general and the data provided by District Level Household and Facility Survey (DLHS-3), India in particular. The data shows that place of delivery (government hospital, private clinic or home) is not a major determinant of delivery complications but the socio-cultural background like education, income and place of residence are important determinants. Even institutional delivery increases with the education level and wealth of the women. Rural-urban gap in institutional delivery was seen to be 35.9 percent. Despite being a comparatively richer state, anaemia is a very important determinant of maternal health in the state. The paper concludes that policy intervention is required to ensure empowerment, freedom, peace, justice and inclusion of women for sustainably improving the maternal health.

Navaneetham et.al (2002) This paper examines the patterns and determinants of maternal health care utilization across different social settings in south India: in the states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Data from the National Family Health Survey (NFHS) carried out during 1992–93 across most states in India are used. The Result revealed that utilization of maternal health care services is highest in Kerala followed by Tamil Nadu, Andhra Pradesh and Karnataka. Utilization of maternal health care services is not only associated with a range of reproductive, socio-economic, cultural and program factors but also with state and type of health service. The interstate differences in utilization could be partly due to variations in the implementation of maternal health care program as well as differences in availability and accessibility between the states. In the case of antenatal care, there was no significant rural–urban gap,

thanks to the role played by the multipurpose health workers posted in the rural areas to provide maternal health care services. The findings of this study provide insights for planning and implementing appropriate maternal health service delivery programs in order to improve the health and well-being of both mother and child.

Nutrition is one of the major environmental factor for responsible for the maintenance of health and physical fitness. The nutrition and health care among young women are influenced by several factors, the most important being the socioeconomic status. The present study clearly demonstrated that the majority of rural young women are not only undernourished but also short stature and emaciated. The result of the present study clearly indicates that the young rural women in pre-pregnancy state would not have optimum nutritional status. The findings of the study reveal that there is an urgent need to initiate nutrition supplementary intervention measures as well as nutrition education programmes to improve the health and nutritional status of women from deprived communities. **Nagamani (2014)**

Ramesh (2014) A study by examined nutritional status of women, with the help NFHS-2 and NFHS-3 data and to identify the major determinants of the malnutrition among ever married women. X2 test has been carried out to examine the association between nutritional statuses of women with health outcomes. Logistic regression analysis has been carried out to find out important factor determining the nutritional status of women and the results show that, age, education, current works status, standard of living and husband's education is significantly associated with both underweight and overweight in NFHS-2. In NFHS-3, age, woman's education, work status, religion, household standard of living, and husband's education are significant on women's nutritional status.

The utilization of maternal health care services is a complex phenomenon and influenced by several factors **Rawat et . al (2015)** The objective of the study was to analyze the utilization of maternal health services and its determinant that affects at community and regional levels by using DLHS-III. Bi-variate and multiple logistic regressions have been used for analyzing all these things. The study found out Home Delivery was found more in rural (74.1) than urban (46 percent), but maximum delivery was found normal in both rural (94.5%) and urban (85.4%) setting, birth that had been conducted by unskilled persons was also high in rural (94%) and urban (87%) settings. The utilization of any ANC, Institutional delivery and PNC was 59 percent, 28 percent and

26 percent respectively. There was also a large significant variation in utilization of ANC services and services at the time of delivery used in between rural and urban settings. Households' socio-economic status, mother's education, caste and birth order was the most-important determinants associated with the use of any ANC and institutional delivery. Therefore, at community-levels, there should be increased utilization of maternal health services and focus on vulnerable section of the community (Poor and SC/ST groups) and regional-level awareness interventions.

Women play a central role in the nutritional status of children. This review highlights the urgent need to address the public health problem of under nutrition in women. The dimension of malnutrition problem in women in India is presented to its implications on birth outcome and under nutrition in children. The result found out under nutrition in women is not limited to access to adequate and diversified food but is influenced by early marriage and conception, education, empowerment and decision making power, domestic violence. These factors directly or indirectly impact on the nutrition situation of women. A number of policies in India address these issues but implementation remains weak. The crucial role of women's nutrition on their right to healthy living as well as for reducing under nutrition in children needs to be recognised and accorded a high programme priority. **Vir et .al (2015)**

Trends in maternal health

Sreekumari and Nair (2018) analysed trends in MMR in Kerala. Kerala has the lowest maternal mortality ratio compared to other Indian states. But when compared to developed countries Kerala has still a long way to go. The study aimed to analyse the causes of maternal deaths that occurred in the study setting for a period of seven years (2011-2017). All maternal deaths that occurred in the study setting from January 2011 to December 2017 were found out from registers. The baseline socio demographic characteristics, gravidity, parity, cause of death were recorded using structured proforma and analyzed using SPSS software. Total maternal deaths during the time period was 101. There were 66441 live births. Maternal mortality ratio for the seven-year period was 152. Majority were primigravidae (50.49%), of low socio-economic status (79.2%), rural population (81.1%) and referred from periphery after identifying complication (85.1%). Caesarean section was the commonest mode of delivery among them (43.56%). Regarding cause of death, indirect maternal deaths were more than direct deaths (50.49% versus

42.57%). Cardiac disorder was the leading indirect cause (12.87%), postpartum haemorrhage (13.86%), Hypertensive disorders (8.91%) and Sepsis (7.9%) were the leading direct causes. Early referral protocols, increasing blood and blood component availability in the periphery should be reinforced. Regarding indirect causes medical boards should be constituted in tertiary care centres for prompt and efficient multidisciplinary care.

Montgomery et.al(2014) conducted a study on maternal mortality in India Data on cause-specific mortality, skilled birth attendance, and emergency obstetric care access are essential to plan maternity services. They presented the distribution of India's 2001–2003 maternal mortality by cause and uptake of emergency obstetric care, in poorer and richer states. The Registrar General of India surveyed all deaths occurring in 2001–2003 in 1.1 million nationally representative homes. Field staff interviewed household members about events that preceded the death. Two physicians independently assigned a cause of death. Narratives for all maternal deaths were coded for variables on healthcare uptake. Distribution of number of maternal deaths, cause-specific mortality and uptake of healthcare indicators were compared for poorer and richer states. There were 10 041 all-cause deaths in women age 15–49 years, of which 1096 (11.1%) were maternal deaths. Based on 2004–2006 SRS national MMR estimates of 254 deaths per 100 000 live births, we estimated rural areas of poorer states had the highest MMR (397, 95%CI 385–410) compared to the lowest MMR in urban areas of richer states (115, 95%CI 85–146). We estimated 69 400 maternal deaths in India in 2005. Three-quarters of maternal deaths were clustered in rural areas of poorer states, although these regions have only half the estimated live births in India. Most maternal deaths were attributed to direct obstetric causes (82%). There was no difference in the major causes of maternal deaths between poorer and richer states. Two-thirds of women died seeking some form of healthcare, most seeking care in a critical medical condition. Rural areas of poorer states had proportionately lower access and utilization to healthcare services than the urban areas; however this rural-urban difference was not seen in richer states. Maternal mortality and poor access to healthcare is disproportionately higher in rural populations of the poorer states of India.

Ashok et.al (2008) mentioned the maternal mortality and the common complications leading to maternal death over a period of 7 years from January 1999 to December 2005. The result revealed that the maternal mortality rates (MMR) of 258.14 to

683.9 per 100,000 live births were observed over the 7 years. The women who died 92.3% were from rural areas. 70.8 percent were unbooked for delivery. 78.5 percent were in 21-30 year age group. Haemorrhage was the commonest cause of death followed by eclampsia. Anaemia was the major indirect cause of maternal mortality. It concluded that Haemorrhage and eclampsia were major causes of death. Anaemia was an important indirect cause of death.

Ahmed et .al(2016) Maternal mortality has been identified as a priority on health policy and research agendas for developing countries. MMR has been decreased from 398/100,000 live births in 1997 to 178 in 2013 India and 347 in 2011 to 301 in 2013 in Assam, India. Maternal death may occur during antenatal, intranatal or postnatal period thus necessitating services during these periods. For pregnant women during antenatal, intranatal or postpartum period – ante natal care services, institutional delivery, access to basic emergency obstetric care (BEmOC) and comprehensive emergency obstetric care (CEmOC), post natal care, referral services should be provided. In the event of injection oxytocin not being available due to constraints of optimal storage conditions or other logistical barriers, misoprostol is recommended to be given for prevention of PPH. Government of India policies and strategies (NPP/RCH II) have focused on enhancing access and availability of comprehensive abortion care services in both the public and private sector. Maternal death review should be done in case of any maternal death to find out the associated factors. “Maternal near miss” surveillance is an effective tool for improving safe motherhood programs. Government of Assam has kept goal 2 under Assam bikas yojna: reduction in maternal mortality ratio to 210 per 100000 live births. Some planned strategy taken for achieving this goal. But for success in reducing maternal death the community will need to be involved not only through educating them about the signs and symptoms of emergency but also to develop appropriate mechanisms for ensuring that women in distress get the quality care.

Khatun et.al(2018) To identify the maternal awareness of antenatal care on impact of mother’s and new born health in Bangladesh. The study that maternal awareness of antenatal care on impact of mothers and new born health was statistically significant different between rural and urban mothers.

Montgomery et.al (2013) analysed Data on cause-specific mortality, skilled birth attendance, and emergency obstetric care access are essential to plan maternity services.

Distribution of number of maternal deaths, cause-specific mortality and uptake of healthcare indicators were compared for poorer and richer states. There were 10 041 all-cause deaths in women age 15–49 years, of which 1096 (11.1%) were maternal deaths. Based on 2004–2006 SRS national MMR estimates of 254 deaths per 100 000 live births, we estimated rural areas of poorer states had the highest MMR (397, 95%CI 385–410) compared to the lowest MMR in urban areas of richer states (115, 95%CI 85–146). It estimated 69 400 maternal deaths in India in 2005. Three-quarters of maternal deaths were clustered in rural areas of poorer states, although these regions have only half the estimated live births in India. Most maternal deaths were attributed to direct obstetric causes (82%). There was no difference in the major causes of maternal deaths between poorer and richer states. Two-thirds of women died seeking some form of healthcare, most seeking care in a critical medical condition. Rural areas of poorer states had proportionately lower access and utilization to healthcare services than the urban areas; however this rural-urban difference was not seen in richer states. It concluded that the maternal mortality and poor access to healthcare is disproportionately higher in rural populations of the poorer states of India.

Vora et .al (2009) analysed the trends in maternal mortality, the maternal healthcare-delivery system at different levels, and the implementation of national maternal health programmes, including recent innovative strategies. The study found that the causes for limited success in improving maternal health and suggested measures to rectify them. It concluded better reporting of maternal deaths and implementation of evidence-based, focused strategies along with effective monitoring for rapid progress. It also stresses the need for regulation of the private sector and encourages further public-private partnerships and policies, along with a strong political will and improved management capacity for improving maternal health.

Utilisation of maternal health care services

Arokiasamy et.al (2012) mentioned the degree to which the observed consistency in maternal health-care utilization can be accounted for by social and economic demand determinants at individual and household level on the one hand and community access to health services in terms of health, road and education facilities on the other. The inequalities in maternal health-care utilization by socio-economic status have narrowed because of the impact of complementing factors of greater community access, and social

and economical advancement in the south Indian states, where overall maternal health-care coverage is at the top end of the scale. In contrast, in the demographically lagging northern states of India, which are at the bottom end of the health coverage scale, both access and socio-economic demand determinants indicate greater inequalities in maternal health-care utilization. He pointed out that the Lack of access to health care, slow progress in socio-economic conditions and cultural constraints are major determinants of poor maternal health-care coverage among Indian states.

A study was conducted with an aim to assess the utilization of maternal health care services (ANC and PNC) and the factors influencing maternal health care utilization in urban slums of Lucknow .**Deepak et.al(2018)**.The study found that utilization of maternal health care services was sub-optimal, few indicators being abysmally low like PNC visits (5%).Socio-demographic factors like education of women, Religion and parity was found to be significantly associated with maternal health care utilization. It concluded that the better utilization of the maternal health care services can be achieved by overall socio-economic development including focus on women empowerment and education, focus on religious norms and faiths in the health policies.

Dixit et.al (2016) in their paper have to address the issue of whether women were consistent in delivering births in an institutional care center over successive pregnancies in India and to investigate the factors associated with consistent utilization of institutional delivery. The study where data the third round of the National Family Health Survey in 2005-2006.The results revealed that region and place of residence, woman's education, wealth index, having experienced the loss of a child, ever having terminated a pregnancy, and birth order are significant predictors of place of delivery for all three recent births among ever-married women. The results further showed that previous utilization of institutional delivery was an important predictor of utilization for subsequent institutional deliveries.

Kalule-Sabiti et.al(2015) investigated the effect of demographic and socio-economic factors on the utilization of maternal health care services using the data from Uganda Demographic Health Survey (2006). Three measures of maternal health care services were examined, namely visits to antenatal clinic, tetanus toxoid injection and place of delivery. Using binary logistic regression model, they found that urban women are more likely than their rural counterparts to use antenatal care services, receive tetanus

toxoid injection and deliver their babies in public health facilities. The same positive association was observed between a woman's educational attainment and visit to antenatal care clinic, place of delivery and tetanus toxoid injection.

Lijina (2015) tried to examine the various services provided through NRHM to maternal and child healthcare and also checked the effectiveness in the provision of these services. This study concentrates on service delivery and utilization in the maternal and child healthcare level. Only some of the NRHM services are familiar to the people and some have not yet reached them. The available services are utilized by them most efficiently.

Inequity in the use of health care services is an important factor affecting the maternal and child survival. In southern Odisha, the health indicators remained below compared to the state and national average. Therefore a study was undertaken by author in Odisha **Mahapatro et.al (2015)** The result found out that the important determinants in utilization of health care services by women were transportation and financial constraints. In addition, it was found that divergent aetiological concepts and low perceived hospital benefits of the women and community were equally important determinants. Further, community had different perceptions and interpretations of danger signs influencing the risk approach and health care seeking behaviour. It concluded that to increase the utilization of health care services, the grass root health workers should be made aware of specific social determinants of risk, perceptions and preferences. More attention should be given to the transportation system, and its operational feasibility. The husband of the women and the elders of the family should be considered as an important unit of interjection. A more individualized antenatal consultation could be provided by taking into account women's perception of risk and their explanatory models.

Health status of any community depends on the care provided to its vulnerable population like women and children. Good care during pregnancy assures an uneventful childbirth and healthy mother and child. Hence this study was conducted to assess utilization of antenatal care (ANC) services by mothers attending immunization clinics in a primary health centre (PHC) and subcentres. Results inferred that Full ANC services were utilized by 93% women. All mothers had registered pregnancy and most within 1st trimester. 61% were staying in village more than 10 km away from a PHC. 42.5% of mothers had married before 18 years and 54.5% had their first pregnancy between 15 to 20

years. It concluded that Awareness and utilization of ANC services was high in the study area. Child marriage and teen age pregnancies were considerably high **Murthy et.al(2016)**.

The effect of maternal health on the under five-mortality has been analysed by **Pandey et.al (2009)** by using the data from National Family Health Survey 2005-06 for rural India. The paper found that there exists strong association between maternal health and child mortality. In particular, the effects of maternal height, weight, presence of any disease and anaemia are found significant. It concluded that if the possible generational transfer of poor health from a mother to her child has to avoid, policies aimed at attaining the millennium development goal of reduced child mortality should be directed on improving the health of existing and future mothers.

In their study pointed out that maternal mortality is on an average 18 times higher in developing countries as compared to developed countries. Despite the existence of many national programs for improving maternal and child health, maternal mortality and morbidity continue to be at higher side, at an unacceptable level. With this background **Patel et.al (2015)** undertook a study to analyse the extent of maternal health care utilization; and to study the factors affecting utilization of maternal care services. The result found out around 80% respondents received antenatal care (ANC) and 20% did not seek ANC. Overall, ANC registration was quite good (92%) but within first trimester it was only 58%. Immunization for tetanus was 79% but consumption of iron and folic acid tablets was taken only by 76%. Reason for inadequate utilization was mainly due to either unawareness or financial constraints. They concluded that the utilization of ANC services and deliveries at health centers were significantly associated with education of the women, education of their spouses, and socioeconomic status of the family.

Sinha et.al (2014) tried to examined the association between the men's knowledge regarding the maternal health service utilization and maternal health in India using data from National Family Health Survey 2005-06. The indicator of maternal health used in the analysis is safe delivery. Binary and multinomial logistic regression were used. Males involvement coded into two ways and two categories viz father present at the time of ANC visit or not, and whether at any time during the pregnancy any health provider or health worker told them about the various sign of pregnancy complications or not. The other independent variables used in this analysis were age, children ever born, work status of the

women, education of the women, religion and caste. The findings clearly suggest that male involvement and their knowledge about maternal health were significantly associated with the maternal health. Those women's husband who had knowledge regarding maternal health and those who were present at the time of ANC visit were more likely to utilize safe delivery service.

Sinha et.al(2015) the data of selected North and south Indian states from the National Family Health Survey (2005-06) to examine the relationship between experience of spousal violence by young married women and utilization of maternal and child health care services. Result inferred the variation was observed in MCH care utilization and levels of violence, where the south Indian states better than the North. The study also suggested Integration of violence screening and counselling with MCH programs could be helpful to address the needs of abused pregnant women to provide essential care.

Maternal and child health care is one of the components of primary health care. According to World Health Organization, 50-70% of maternal deaths occur in postpartum period. The study is aimed to assess the utilization of postnatal care services and associated factors in rural area of Western Rajasthan **Uppadhaya et.al (2016)**. Only 35.86% mothers received 2 or more postnatal care services within 42 days of delivery. The main reason behind this was lack of knowledge/ unawareness about benefits of postnatal services. The important factors associated with low utilization of postnatal services were lower literacy level of mother, lower socioeconomic status, working mothers, nuclear family and parity of mother. It concluded that the present study revealed low utilization of postnatal care services among the study population. Advancement of health facilities, encouragement of service provider, sustainable maternal and child health programs and creating awareness will support to achieve furthermore better results in the postnatal services utilization.

In developing countries, the leading cause of disability in women aged 15-44 years is pregnancy and childbirth related complications. Many women do not die of causes related to pregnancy but suffer severe morbidities due to pregnancy related physiological stress. The study revealed a high prevalence of maternal morbidity in Sangli, Maharashtra, India. 52.65% women in urban area and 96.53% in rural area suffered from at least one morbidity. In rural area of Sangli, Maharashtra, India maximum of the women surveyed i.e., 30% have primary school education as compared to urban area of Sangli,

Maharashtra, India which constitute 34%. A majority of the women in both the districts were suffering from mild complications but the percentage of serious complications is very high in the rural area (15%) than in the urban area (6%). It concluded that In spite of low levels of perception about maternal morbidities, relatively higher utilization of health services during antepartum period should be taken as an advantage for initiating complete antenatal services, i.e. beyond the coverage of women by TT injection and supply of IFA tablets. The governmental initiation of supplying protein-rich food to pregnant and lactating mothers through ICDS programme has significantly lowered the morbidity levels probably by lessening the levels of anaemia **Quraishi et.al(2017)**.

Related studies

Ashok et.al (2008) mentioned the maternal mortality and the common complications leading to maternal death over a period of 7 years from January 1999 to December 2005. The result revealed that the maternal mortality rates (MMR) of 258.14 to 683.9 per 100,000 live births were observed over the 7 years. The women who died 92.3% were from rural areas. 70.8 percent were unbooked for delivery. 78.5 percent were in 21-30 year age group. Haemorrhage was the commonest cause of death followed by eclampsia. Anaemia was the major indirect cause of maternal mortality. It concluded that Haemorrhage and eclampsia were major causes of death. Anemia was an important indirect cause of death.

Chandhiok et.al(2006) examined the possible factors contributing to women obtaining antenatal care services whether these services influence their decision regarding the place of delivery. The result was carried out on 5344 pregnant women with a gestation of more than 4 months. Of these, 73.9% had at least one antenatal contact with a auxiliary nurse midwife (ANM) or had visited a Government Health Facility for antenatal services or problems. There was a statistically significant reduction in the proportion of women obtaining antenatal care services with increasing age, parity, and number of living children. No association was observed with outcome of previous pregnancy and presence of health facility in the village. Awareness of care during pregnancy and knowledge of pregnancy related complications were associated with increased utilization of antenatal care services. However, knowledge of serious complications was found to be lacking even in women who availed of the care. In both the groups – those who availed of antenatal care services and those who did not – about 14% had not decided about the place of

delivery. Nearly 51.7% of the women with antenatal care preferred institutional delivery as compared to 27.6% of those who had not availed antenatal care services. They concluded that there is a need for improving community awareness on maternal health and for motivating women to utilize maternal care services.

The National Family Health Survey (NFHS-III 2005-06) provided a gloomy picture of the status of maternal health indicators of Uttarakhand **Chimankar et .al (2011)** .The state has witnessed a higher proportion of high risk pregnancies. A large number of births take place outside the health system (67.4 percent), the majority being attended by untrained dais (midwives). These have resulted in higher maternal morbidity and mortality. The study found out the possible factors influencing the use of maternal health care services, using the data from NFHS III. Both bi-variate and multivariate analysis have been carried out for the study by taking ante-natal care and delivery care as dependant variables. The result reveals that the educational level of women, birth order and wealth index are significant predictors in explaining ante-natal and delivery care. Controlling the effect of other variables, the predictive power of women's educational level, wealth index have been positively associated with antenatal care and also delivery care.

Dehury et.al(2018) analysed Maternal health constitutes of women during pregnancy, childbirth and the postpartum period. Bihar and Madhya Pradesh (MP) constitute the Empowered Action Group (EAG) states under National Rural Health Mission (NRHM) and are consistently having poor maternal health indicators. The main objective of the study was to assess the maternal health situation of Bihar and MP based on National Family Health Survey (NFHS-3) and 4 fact sheets. The result revealed that the progress has been observed from NFHS-3 to NFHS-4 however, the progress is very dismal compared with the progress of other similar Indian states. Relatively MP has shown better progress compared to Bihar. Poor performance is being observed in all the three levels of maternal health; pregnancy {Ante-Natal Care (ANC), Tetanus toxoid (TT) and Iron and Folic Acid (IFA)}, child birth (Institutional delivery by Skilled Birth Attendant (SBA), Caesarean Section (CS) and postpartum care (hospital stay and Janani Suraksha Yojna (JSY). The poor performance of both these states in all these indicators requires multipronged approach strong political will, health system strengthening, community mobilization and awareness. It concluded that the status of maternal health in India and more especially in states BIMARU (Bihar, Madhya Pradesh, Rajasthan, and Uttar

Pradesh) and EAG states (Empowered action group), improvement in the performance of maternal health related activities is highly necessary.

Habtom et.al (2017) it analysed the use of antenatal, postnatal, and delivery care services in Eritrea. The result found that the most important factors influencing the use of maternal and child health services in Eritrea are demographic and socio cultural in nature. It was found that women delivering at younger age were more likely to use antenatal care, receive skilled attendance at delivery and use postnatal care. It concluded that the Socio-cultural and demographic factors are the most important variables that affect the use of maternal and child health services in Eritrea. Socio-cultural factors play an important role in maternal and child health services in Eritrea.

Kumar et.al (2016) the objective their study was to find out the association of pregnancy and use of antenatal care by women in respect to their awareness. The result found that the pregnant women who applied for checkups were only 40 percent. HB test of antenatal was only 36 percent, 64 percent ladies used 100 tablets, IFA. Extra diet was taken by 20 percent women.

Kumar et.al (2011) mentioned that the antenatal care is to offer information and advice to pregnant women about pregnancy related complications and their possible preventive and curative measures. However, uptake of these services is far from universal even in setting where they are widely available. The objective of this study will analysed to

- (a) To assess the antenatal coverage and health seeking behaviour of the pregnant women.
- (b) To assess the utilization of Public Health Services and perceptions of these services by pregnant women.

The result revealed that Out of 502, 234 (46.61%) were those who received ANC check up and 268 (53.39%) were those who did not received any ANC check-up. IFA tablets distribution were the most common ANC services provided to the participants. However the important services like counseling about diet, rest, family planning were least consulted. It concluded that there is a need for further strengthening of ANC services so as to increase the ANC coverage. The present study also concludes that there is a need for the programme managers to direct their strategies to motivate families to utilize these services even when they are well aware that it is necessary for them.

Mavalankar (2009) pointed out several challenges for reducing the maternal mortality ratio, including lack of the managerial capacity, shortage of skilled human resources, non-availability of blood in rural areas, and infrastructural bottlenecks, in

Gujarat. The Government has taken several initiatives to improve maternal health services, such as partnership with private obstetricians to provide delivery care to poor women, a relatively-short training of medical officers and nurses to provide emergency obstetric care (EmOC), and an improved emergency transport system. Some of the suggestions emerged were expanding the management capacity for maternal health, operationalization of health facilities, and ensuring EmOC on 24/7 (24 hours a day, seven days a week) basis by posting nurse-midwives and trained medical officers for skilled care, ensuring availability of blood, and improving the registration and auditing of all maternal deaths. However, all these interventions can only take place if there are substantially-increased political will and social awareness.

Nair et.al (2016) conducted a study in Maharashtra where the authors to assess the maternal mortality ratio (MMR) and the causes of maternal mortality over a period of 3 years in a tertiary care hospital. The result revealed that Average of MMR over 3 years study period (January 2012 to December 2014) was observed to be 410/1, 00,000 live births. Most of the maternal deaths occurred in age group of 19-24 years (43.4%). Majority of maternal deaths was observed in multipara (52.2%) and women coming from rural area (52.9%). 44.9% of maternal deaths occurred within 24 h of admission. Haemorrhage was the leading direct cause of maternal deaths (33.8%) followed by eclampsia (10.3%) and sepsis (8.1%). Among indirect causes of maternal deaths anemia (14.7%) was the leading cause. It concluded that MMR in our study was very high as compared to national average of 167/1, 00, 000 live births, being a tertiary care hospital as most of the patients were referred from peripheral centers. Most maternal deaths are preventable by intensive health education, basic obstetric care for all, strengthening referral and communication system and emphasizing on overall safe motherhood.

Rahiyath et.al(2015) mentioned NRHM is a biggest health project in India's health sector over the last 50 years, classifies states in to high- focused and non- focused states and giving freedom to each state to implement their own programmes for achieving the targets. The mission accepts a synergistic approach by relating health to determinants of good health viz, segments of nutrition, sanitation, hygienic and safe drinking water. Review of NRHM studies clear that NRHM is a sincere effort to craft plausible public health system in India, which lead to reach out health services to the vulnerable sections of the society. The mission targeted to full fill their objective of health sector development within 2005-12 period, and the mid- term appraisal of NRHM has found that there has

been a significant improvement in health indicators even in the short period. In this context there is a scope to evaluate the performance of the mission and its impact on the health sector. The present study is a comparative study focusing on NRHM in two states of India namely Kerala and Bihar in order to understand the utilization of NRHM funds and its impact on health sector. Compare to Bihar (high- focused state), the state Kerala (non- focused state) has the dominance in the success of the mission in health indicators and infrastructure development. But the trend of NRHM expenditure is not at all satisfactory in both states.

Ray et.al(2018) studies related to maternal health was one of the most important millennium development goals (MDGs), India didn't achieve by the year 2015. Since, India is a multicultural, social and multiregional country, where some of the regions have good social and demographic achievement while some are poor. Haryana is one of them, which has 146 maternal mortality ratio. The level of receiving antenatal care (ANC) in Haryana is quite low as compared to other states of India. Objective of present study was to understand the extent of use of maternal health care services in Haryana as well as examining the role of antenatal care and other socio-economic factors on the utilization of maternal health services. The result revealed that the utilization of ANC (any and full), institutional delivery and post-delivery treatment seeking varies among women by literacy, age at first marriage, age at women and place of residence. Literate women are two times more likely to access ANC [odds ratio (OR)=1.97 (any ANC), 1.95 (full ANC), $p<0.01$] and 1.52 times more likely to prefer institutional delivery [OR=1.52, $p<0.01$].It concluded that the Empowering women through the encouragement of mother's education should be one of the most fundamental strategies to promote maternal health care services and reduce inequalities.

A study on antenatal care (ANC) services in four States namely, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh was accepted by **Singh et.al(2001)** The study revealed that only 35 per cent of mothers from a total of about 6,150 mothers from 900 villages of 30 districts had received the full package of ANC services in comparison to 53 per cent at the all India level. It has been observed in the study that literacy of women has been found to play a key-role in the utilization of ANC. To increase the coverage of antenatal care in the States under study, the authors suggest information, education and communication (IEC) which will help mothers to understand the importance of immunization.

Maternal mortality remains one of the biggest public health problems in Nepal. Lack of access to basic maternal healthcare, difficult geographical terrain, poorly developed transportation and communication systems, poverty, illiteracy, women's low status in the society, political conflict, shortage of health care professional and underutilization of currently available services are major challenges to improving maternal health in Nepal. According to **Simkhada (2006)** In order to effect real improvements in maternal health, attention needs to be focused both on biomedical and social interventions. The study suggested that Improving health facilities, mother's nutrition, women's position in the society such as freedom of movement, providing education to female children, integrating Traditional Birth Attendants into local health services can play a vital role in the improvement of mothers' health.

Srivastava et.al(2014) tried to trace the evolution of concern with quality in maternal health in the context of health system development in India from independence to the present; and wanted to identify quality-related issues and areas for further action to improve maternal and infant survival outcomes. It found out the concerns with infrastructure expansion and vertical disease eradication programmes neglected quality of maternal healthcare in India. With growing concern for quality, strategies addressing this were incorporated in NRHM launched in 2005, including public health standards and quality assurance system in reproductive and child health services. It concluded that the focus on quality in maternal health in India has increased in recent years, especially under NRHM, and this has helped accelerate progress in maternal and neonatal outcomes. Further action areas include the need to increase funding, match rising demand with quality services and enhance functioning of quality assurance system.

Shafqat et.al(2015) wanted to assess the knowledge and awareness of pregnant women regarding antenatal care and delivery, where the authors employed and personal interview method was adopted to collect information from the respondents. To select the sample the mean age of the sample was 25.15 years with 4.45 +_SD. Two hundred and twelve (82.81 percent) women had the knowledge of antenatal care and thought that it was important while 44 (17.81 percent) women had knowledge of antenatal care but they thought it was not important. Two hundred and fifteen (83.98 percent) women had awareness regarding appropriate diet and 207 (80.85 percent) had knowledge regarding iron and vitamin supplementation during pregnancy. Two hundred and fifty (90.65 percent) women believed that getting antenatal care will improve the pregnancy outcome.

130(50.78 percent) women had taken folic acid supplementation in first trimester. Two hundred and twenty (88.67 percent) women thought that they got the expected antenatal care in hospital. Two hundred and ten (82.03 percent) women favoured hospital as a place of delivery while 46 (17.96 percent) preferred to deliver at homes and private clinics. Two hundred and eight (81.25 percent) women wanted a doctor to attend their labour. Only 116 (45.31 percent) women had antenatal care in their past pregnancies. The awareness about antenatal care was highest in primigravida (86.95 percent), in younger women (18-35) (84.54 percent), in educated couples (92.5 percent) with better socio-economic status (79 percent). Result inferred that Knowledge about antenatal care and its importance was much higher in primigravidas, younger educated women having educated husbands and better socio economic status. Majority thought that antenatal care was important and they, took appropriate diet and iron, folic acid and vitamin supplement, and favoured hospital delivery by skilled personal.

Kerala has the lowest maternal mortality ratio compared to other Indian states. But when compared to developed countries Kerala has still a long way to go. **Sreekumari (2018)** study aimed to analyse the causes of maternal deaths that occurred for a period of seven years (2011-2017). The study found out the Total maternal deaths during the time period was 101. There were 66441 live births. Maternal mortality ratio for the seven-year period was 152. Majority were primigravidae (50.49 percent), of low socio-economic status (79.2 percent), rural population (81.1 percent) and referred from periphery after identifying complication (85.1 percent). Caesarean section was the commonest mode of delivery among them (43.56 percent). Regarding the cause of death, indirect maternal deaths were more than direct deaths (50.49 percent versus 42.57 percent). Cardiac disorder was the leading indirect cause (12.87 percent), postpartum haemorrhage (13.86 percent), Hypertensive disorders (8.91 percent) and Sepsis (7.9 percent) were the leading direct causes. It concluded that early referral protocols, increasing blood and blood component availability in the periphery should be reinforced. Regarding indirect causes medical boards should be constituted in tertiary care centres for prompt and efficient multidisciplinary care.

Samani et .al(2017) estimated that Mortality of pregnant mother is one of the most important indices for evaluation of socioeconomic development of a society and can show efficiency of health system of a country. Many causes of maternal mortality can be prevented or avoided. This study is conducted to specify the causes of maternal mortality.

The result revealed that According to autopsy results, heart diseases with 34 cases (20.1%) have been the most important causes of mortality of pregnant mothers and after that, respiratory failures with 24 cases (14.5%) and obstetric complications (bleeding and infection after delivery) with 22 cases (13.3%) have been the most important causes of maternal mortality. It concluded that the Heart diseases, respiratory problems and bleeding have been the most important causes of maternal mortality and the importance of preventive measures for such health problems can be felt more than before. For the women with planning for pregnancy, the clinics should complete assessment of the cardiovascular and respiratory diseases fully and accurately in pre-pregnancy cares. Also, risk factors such as obesity, unhealthy diet and insufficient physical activity should be defined for them and required measures should be taken to meet these factors.

Shafqat et.al(2015) wanted to assess the knowledge and awareness of pregnant women regarding antenatal care and delivery, where the authors employed and personal interview method was adopted to collect information from the respondents. To select the sample the mean age of the sample was 25.15 years with 4.45 +_SD. Two hundred and twelve (82.81 percent) women had the knowledge of antenatal care and thought that it was important while 44 (17.81 percent) women had knowledge of antenatal care but they thought it was not important. Two hundred and fifteen (83.98 percent) women had awareness regarding appropriate diet and 207 (80.85 percent) had knowledge regarding iron and vitamin supplementation during pregnancy. Two hundred and fifty (90.65 percent) women believed that getting antenatal care will improve the pregnancy outcome. 130(50.78 percent) women had taken folic acid supplementation in first trimester. Two hundred and twenty (88.67 percent) women thought that they got the expected antenatal care in hospital. Two hundred and ten (82.03 percent) women favoured hospital as a place of delivery while 46 (17.96 percent) preferred to deliver at homes and private clinics. Two hundred and eight (81.25 percent) women wanted a doctor to attend their labour. Only 116 (45.31 percent) women had antenatal care in their past pregnancies. The awareness about antenatal care was highest is primigravida (86.95 percent), in younger women (18-35) (84.54 percent), in educated couples (92.5 percent) with better socio-economic status (79 percent).Result inferred that Knowledge about antenatal care and its importance was much higher in primigravida, younger educated women having educated husbands and better socio economic status. Majority thought that antenatal care was important and they,

took appropriate diet and iron, folic acid and vitamin supplement, and favoured hospital delivery by skilled personal.

Shanmugam et .al(2018) Socio-economic status is an important factor in determining the quality of life of women. It has been observed that women of lower socio-economic status often do not avail the existing reproductive health care services, particularly delivery care services. Socio-economic factors have great influence on the use of healthcare services. Educational levels influence the use of health services in several ways such as antenatal check-ups, institutional deliveries, consulting the doctors, contraceptive usage and sexual health care. The objectives are 1) to examine the socio-economic characteristics and the living conditions of pregnant women, 2) to investigate the pregnancy, abortion, preference of child and mind-set of pregnant women and 3) to identify and analyse the factors responsible for maternal care of women in Papanasam Taluk. The result inferred that the study is based on a questionnaire survey by direct observation method. 520 pregnant women were selected by random sampling method. Women who come for health check-ups to the seven primary hospital and two general hospitals are interviewed. The frequency, percentage and factor analysis are used for the analysis and interpretation. It concluded that the socio-economic, demographic and psychological conditions are influencing the maternal healthcare of women. However, during pregnancy they have taken maximum effort and utilized the available healthcare facilities in this area. Therefore, the health problems of pregnant women are prevented by proper and regular health check-ups to avoid infant death in this talk. Further, the emergency unit should run round the clock in all the health centres. The hospitals should introduce new technological instruments in all the health centres.

Shrivastava et.al(2016) study of maternal mortality ratio in Uttar Pradesh in that study Uttar Pradesh is very high as compared to national average. Baba Raghav Das Medical College in the last 4 years (2011-2014) to explore each and every maternal death that had occurred in the institute. The result inferred the maternal mortality ratio has dropped almost six times in the last 11 years. Early age of marriage, illiteracy, poor socio economic status, and multiparty were found to be important determinants of maternal mortality and can act as risk factors. The pattern of causes of maternal deaths in this institute (preeclampsia) is different from that found in the community (postpartum haemorrhage). Delay in seeking care because of unawareness and illiteracy and ignorance was found to be the major contributing factor for most of the maternal deaths.

Sharma et. al(2014) Postnatal period is a vulnerable time, because most maternal and new born deaths occur during this period, especially immediately after childbirth. Postnatal care in the first hours and days after childbirth could prevent the great majority of these deaths. The objective of this study was conducted with the objective to assess the utilization of post natal care and associated factors in tribal area of Madhya Pradesh. The result found out Among 210 mothers, 82.4% were 15-24 years of age and 71.9% of mother received post natal check-up within 10 days of delivery. Regarding number of post-natal check-up, 36.6% of mothers received one postnatal check-up, 18.5% two, 14.7% three and only 1.9% received four post natal check-up. The education/occupation of mothers, cast, education of husband, place of delivery, person conducting delivery and level of knowledge of mother about need of postnatal check-up were significantly associated ($P<0.001$) with utilization of post natal check-up. It concluded that the present study revealed that role of education, especially of female education in tribal area, is important contributing factor associated with utilization of postnatal care. Female education is related with enhancing the economic status of mothers, female empowerment, awareness of mother, and independent decisions making capacity in them.

Soman et.al(2017) estimated the maternal care services during the antenatal, intra natal and post natal periods so as to reduce maternity related health problems. The study tried to assess maternity care services among pregnant women in a coastal area in central Kerala, India. The result revealed that the current study the number of pregnancies registered early i.e. within 12 weeks was 72.2%. Only 68% had all the antenatal check-ups while 26.1% had less than 4 antenatal check-ups and 5.9% had no regular antenatal check-ups. Around 67.7% of the mothers had taken iron and folic acid for the prescribed period of pregnancy. Ultrasound examination was done at least once during the pregnancy in 63.3% of cases and not done in 36.7% cases. For tetanus prophylaxis 84.5% had appropriate course of TT vaccination. 73.5% of the mothers were well aware of the danger signs of pregnancy and 21.2% were partially aware and 5.3% were unaware of the danger signs. It concluded that the Antenatal care services are still low in coastal areas compared to other areas in Kerala.

Antenatal care is 'care before birth' to promote wellbeing of mother and foetus **Sruthi et. al(2017)**. The number of antenatal care visits and the timing of the first visit are important for the health of the mother and the outcome of the pregnancy. The use of ANC varies from country to country considerably, with underutilization among pregnant

women, in low income countries like Asia & Africa. Within the country ANC utilization varies with mother's age, education, occupation, income, parity, place of residents, availability and cost of services. In coastal areas most of the people belong to fisherman community and their socio-demographic characteristics are different from that of other areas. Not enough studies have been conducted previously; in coastal areas to obtain data on utilization of ANC services. It is in this background that the present study was carried out to assess the utilization and content of antenatal services among pregnant women in a coastal area. The result revealed that Out of 286 mothers, 179 (62.6%) of pregnant mothers had taken optimum antenatal care and remaining 107 (37.4%) of mothers had taken sub-optimum antenatal care. Among utilisation and content of antenatal services, only 228 (79.7%) of pregnant mothers done the Hb estimation and blood screening in first trimester itself. The proportion of mothers consumed 100 IFA tablets were 279 (89.5%), but 30 (10.5%) mothers had not taken full course of IFA tablets. Only 202 (70.6%) of mothers received the advice on family planning method during their antenatal visits and remaining 84 (29.4%) mothers did not received any advice. There was a statistically significant difference between socio-economic status of pregnant mothers and services like family planning advice and Hb estimation and screening at first trimester. It concluded that study revealed that, even though all the pregnant women were literate and majority had educational status up to high school, the antenatal services like routine blood examination in the first trimester, Iron and folic acid coverage and advice on family planning services were relatively low. Improving the socio-economic status of pregnant women would improve the utilization and content of antenatal care. The study also emphasizes the need for awareness programs for antenatal mothers on content and utilisation of proper ANC.

Srivastava et.al(2014) tried to trace the evolution of concern with quality in maternal health in the context of health system development in India from independence to the present; and wanted to identify quality-related issues and areas for further action to improve maternal and infant survival outcomes. It found out the concerns with infrastructure expansion and vertical disease eradication programmes neglected quality of maternal healthcare in India. With growing concern for quality, strategies addressing this were incorporated in NRHM launched in 2005, including public health standards and quality assurance system in reproductive and child health services. It concluded that the focus on quality in maternal health in India has increased in recent years, especially under

NRHM, and this has helped accelerate progress in maternal and neonatal outcomes. Further action areas include the need to increase funding, match rising demand with quality services and enhance functioning of quality assurance system.

Nagdeva et.al (2009) in their study pointed out the urban-rural differentials and the factors influencing net change in maternal and child health care inputs, their utilization and the output during the NFHS I and NFHS II. The variables have been grouped in to healthcare inputs regarding ante-natal care, post-natal care and child care, utilization regarding maternal and child healthcare outcomes. It has used a bivariate analysis and chi-square test. It revealed that there was an increase in health care inputs, utilization and outputs during the intra-survey period. It concluded that the urban-rural differentials still exist and the government must take the necessary steps to improve MCH programmes including the provision of information and education campaigns, and send dedicated healthcare personnel to remote and inaccessible rural areas to reduce maternal and child mortality rates.

CHAPTER – III

METHODOLOGY

The methodology adopted in the current study “A comparative study on maternal health between Kerala and Uttar Pradesh” is discussed under the following heads:

1. Selection of the Area
2. Selection of the Sample
3. Database of the study
4. Period of study
5. Techniques of Analysis
6. Concepts used

Selection of the Area

India is a federation with the centre and several other states functioning smoothly for its various social, economic and political activities. While some states are advanced in several spheres some are lagging behind in certain development indicators. In terms of many development indicators like education, health, literacy, women empowerment, youth power, maternal and child health Kerala tops the list. Literacy helps the state to move forward in other areas and this is one reason which helps Kerala to attain a higher status in the National health scenario. Uttar Pradesh on the other hand does not depict a similar trend. This state has the maximum number of people and this is the largest area geographically. The status of people in Uttar Pradesh is very poor and utilization of healthcare facilities is neither available nor accessible to people. Many studies pointed out the poor health status of women in Uttar Pradesh. It is these facts which made the investigator to take up these two states – Kerala and Uttar Pradesh for the current study.

Selection of the Sample

The present study made use of details available from NFHS 3 and NFHS 4. Several indicators of maternal health which includes MMR, ANC, PNC and delivery were considered for this study. Women making use of various health facilities during various stages of pre and postnatal care in both the states of Uttar Pradesh and Kerala were taken up.

Data base of the study

Data pertaining the study were collected from NFHS (National Family Health Surveys). The four rounds of National Family Health Surveys (NFHS) conducted during 1992-93, 1998-99 and 2005-06 in India are called as NFHS-1, NFHS-2, NFHS-3, and NFHS - 4 respectively. The NFHS are conducted under the stewardship of Ministry of Health and Family Welfare, Government of India. The key aim of NFHS was to provide state and national level information on fertility, family planning, infant and child morbidity and mortality, maternal and reproductive health, nutritional status of women and children, and the quality of health services. Within each state, a two-stage stratified random sampling design was adopted in rural areas wherein first villages then households were selected for the survey. In urban areas, a three-stage random sampling design was employed with the selection of cities/towns followed by urban blocks and then households.

Period of Study

Data were collected from two surveys – NFHS 3 AND NFHS 4.

Techniques used

Graphs, tables and percentages were used for interpreting the data.

Concepts

Maternal Health

Maternal health is the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to ensure a positive and fulfilling experience in most cases and reduce maternal morbidity and mortality in other cases.

Maternal Mortality Rate

World Health Organization defines maternal health as “health of a women during pregnancy, child birth and postpartum period”. Maternal Mortality Rate is the death rate of women while in pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of pregnancy, from any cause related to or aggregated by the pregnancy or its management but not from accidental or incidental causes. The cause of

maternal morbidity and mortality include haemorrhage, infections, high blood pressure, unsafe abortion and obstructed labour.

Antenatal care

Antenatal care (ANC) refers to pregnancy-related health care, which is usually provided by a doctor, an ANM, or another health professional. Ideally, antenatal care should monitor a pregnancy for signs of complications, detect and treat pre-existing and concurrent problems of pregnancy, and provide advice and counselling on preventive care, diet during pregnancy, delivery care, postnatal care, and related issues.

Postnatal care

The health of a mother and her newborn child depends not only on the health care she receives during her pregnancy and delivery, but also on the care she and the infant receive during the first few weeks after delivery. Postnatal check-ups soon after the delivery are particularly important for births that take place in non-institutional settings. Recognizing the importance of postnatal check-ups, the Reproductive and Child Health Programme recommends three postnatal visits.

CHAPTER – IV

RESULTS AND DISCUSSION

The results of the study on “A comparative study on maternal health between Kerala and Uttar Pradesh” are presented and discussed under the following heads:

- The great divide – Kerala and Uttar Pradesh
- Socio-Economic Background
- Antenatal care
- Delivery care
- Postnatal care
- Nutritional status

The health of a woman in her childbearing years is something that concerns every country throughout the world, but it is of special concern for women. It has therefore now become the focus of attention as it directly affects the general health of women, of their children, their family members and has a great influence on the socioeconomic development of the society. Throughout the world the state of reproductive health of women in a country decides the content of population programmes in that country. In a developing 2 country like India the reproductive health position of women needs urgent attention.

The great divide – Kerala and Uttar Pradesh

Women born in Kerala can expect to live 20 years longer on average than women born in Uttar Pradesh. Uttar Pradesh's infant mortality rate is five times higher than Kerala's. At the start of this century, one in three girls in Uttar Pradesh had never been to school: Kerala has universal enrollment. Kerala's total fertility rate is 1.96 births per woman (lower than 2.1 in the United States and just above 1.7 in high-income European countries); Uttar Pradesh's fertility rate is 3.99 (substantially higher than the average of 2.85 for India and 3.1 for low-income countries). Education and health services in the two states echo these differences. Studies suggest that public facilities in Kerala are likely to be well supplied, adequately maintained, and regularly staffed by teachers or physicians. Not so in Uttar Pradesh. A primary health center in Kerala left unstaffed for a few days may lead to public protests at the nearest district office. But a rural school in Uttar Pradesh can

be non-functional for years and produce no civic protest. Women's participation differs widely in the two states: more than 70 percent of primary school teachers in Kerala are women, only 25 percent in Uttar Pradesh. (World bank 2002). Adult literacy has risen from around 50 percent in 1950 to more than 90 percent now and life expectancy at birth from 44 years to 74. The birth rate has fallen from 32 to 18. In 1956 the Malabar region of Kerala lagged substantially behind the two "native" states (Travancore and Cochin) with which it was combined to form the new Kerala state. Today, the differences have disappeared.

Gender equity and the agency of women appear to play a major role in Kerala's success. Uttar Pradesh has a long, well-documented tradition of oppressive gender relations and extraordinarily sharp gender inequalities in literacy and in women's participation. Basic universal services in schooling, health care, child immunization, public food distribution, and social security differ sharply in scope, access, quality, and equitable incidence. In Uttar Pradesh these services appear to have been widely neglected and there has been no particular effort to ensure results, particularly in schools.

Government's promises to deliver better basic services and these have a higher share of public expenditures as compared to what was spent on state administration. In contrast, in Uttar Pradesh public expenditure was concentrated in state administration and remained well above expenditures on health and education. Medical expenditure per hospitalization in public facility was RS.1417 in Kerala while it was RS.4261 in Uttar Pradesh during closing years of last century. It was also reported that while health facility was clean for 77 percent in Kerala it was only 31 percent in Uttar Pradesh to receive clean facility. Again only 94 percent of the women received skilled delivery care in Kerala the proportion was only 22 percent in Uttar Pradesh. All this reflects the very high health care administration in Kerala compared to that of Uttar Pradesh. Kerala's success is the result of public action that promoted extensive social opportunities and the widespread, equitable provision of schooling, health, and other basic services. They argue that Uttar Pradesh's failures can be attributed to the public neglect of the same opportunities.

Socio – economic Background

Socio-economic background always relate to the general living conditions of the households living in a particular area. This is determined by income, locality, educational status and other criteria which goes into the making of the living condition. The status of a

household or an individual is revealed by the socio-economic background. Many factors are normally considered in analysing the socio-economic condition of a group of people. It includes age, caste, religion, education, occupation, income, housing and other indicators. A vivid look at them would help one to analyse the economic and social background of households. For the current study, only few indicators like those households having electricity connection, drinking water supply, sanitation facility, fuel used, literacy of the women etc. were considered.

The following table depicts the details:

TABLE 4
SOCIO-ECONOMIC BACKGROUND

	Kerala				Uttar Pradesh			
	NFHS 4 (2015 -16)			NFHS 3 (2005-06)	NFHS 4 (2015 -16)			NFHS 3 (2005-06)
	Urban	Rural	Total	Total	Urban	Rural	Total	Total
Households with electricity (%)	99.5	98.9	99.2	91.0	94.9	62.3	70.9	42.8
Households with an improved drinking-water source (%)	95.7	93.0	94.3	69.1	92.6	97.8	96.4	93.7
Households using improved sanitation facility (%)	98.7	97.5	98.1	90.5	68.4	23.2	35.0	20.6
Households using clean fuel for cooking (%)	65.2	50.6	57.4	27.8	78.5	16.4	32.7	17.3
Households with any usual member covered by a health scheme or health insurance (%)	45.3	49.8	47.7	8.9	7.9	5.4	6.1	1.2
Women who are literate (%)	98.4	97.3	97.9	93.0	74.6	56.2	61.0	44.9
Women with 10 or more years of schooling (%)	74.1	70.5	72.2	48.7	48.2	27.4	32.9	18.3

Source: NFHS 3 (2005-06) and NFHS 4 (2015-16)

In the current study few pointers were taken up which has relevance to maternal health. Almost the entire households in Kerala has electricity connection while in UP it is only 70.9 percent during NFHS 4. In UP while 94.9 percent urban households enjoy their facility in rural it is only 62.3 percent. However the overall performance indicate marked improvement over the previous survey.

Drinking water is a major determinant of health of any individual. If drinking water is good it helps individuals to have better health. These days quite a lot of diseases sprout from improve drinking water. Improve water is a measure to the living bodies and many diseases emanates from this. Since the water we get through pipes or taps from corporation or other government bodies are not pure, many household resort to treating it either by boiling or filtering or any other methods. Government also is taking serious efforts to educate the people to treat water before they consume it. Many households do not get directly from common taps or pipes, so many use well water or water from tanks and therefore it needs to be purified. As per the data collected from NFHS, the total Households who had improved drinking water was 69% during the NFHS 3 which increased by 94.3 in NFHS 4. In UP the situation during the same period showed an increase from 93.1 to 96.4%.

Sanitation is yet another reason which has an impact on health. Better sanitation bring in better health. Separate toilet, covered ditches, closed water tanks, clean environments are some of the hall marks of sanitation. In thickly populated areas, sanitation facilities are very meagre and people do not get adequate facilities in terms of toilets, bathrooms and clean environment. Many of houses share the bathrooms and have common toilets. Also there is no adequate water supply in these toilets.

Since the ditches are open it is the habitation for rats, cats and dogs which easily spread many diseases which are life threatening. Though govt. is taking effort through clean India campaign, the effect has not reached the general public. There is lack of awareness on the need to keep clean environment. It could be noticed from the table that in UP only 20.6% of HH were using improved sanitation facility during NFHS 3 while it improved to 35% during NFHS 4. During 2015-16 nearly 68.4% of HH area had better sanitation in rural it was only 23.2%. In the case of Kerala the situation is totally different. While 90.5% had better sanitation in NFHS 3 it increased to 98% during NFHS 4. Both urbanites and rural population had good and improved sanitation facilities. People are educated and specially women folk in Kerala try to keep their surroundings clean and they give top priority to cleanliness. There

may be one reason which helps them to enjoy better health. As is seen from the table while 98% of women folk are educated in Kerala the percentage is only 61% in UP during the NFHS 4. While the difference in educated women between rural and urbanites is very marginal in Kerala, in UP it is nearly 18%. The educated women are easily adoptable to new situations and they always welcome changes which helps in the economic and social betterment of the household and society at large.

Health scheme is usually advocated to help people against any unforeseen or emergency in health and to protect them against such vulnerabilities these schemes are very useful. In the beginning only govt. schemes were available but now the private sector has taken the market and large number of health schemes are available for all types of people. Once a member is covered under health insurance, he/she is protected under their care in terms of heavy medical expenses. Either the insurance agencies takes up the lion share of shedding the expenses or help the individual cover the expenses partly. It all depends upon the amount or the sum insured and the premium paid. The data reveals that in UP only 6% of the households are covered by any health scheme during NFHS 4 it is around 48% in Kerala. So UP had to go much forward in terms of health insurance. Though Kerala seems to be doing well in several other aspects, the households covered by health insurance is only 50%. This may be due to the heavy payment which need to be paid in the beginning or large sums of money which need to be paid as premium. Many people refrain from taking health insurance because, they think if nothing happens the entire amount paid goes as waste. Social and cultural taboos also prevents them from taking UP health cover. Though the government has promised several schemes, many are left out and women bear a great burden of not coming under the umbrella of health insurance. Maternal mortality is exacerbated by bio-medical reasons which can be treated medically. Other than this, there are non-medical reasons such as access to health care and quality of health care, which is affected by socio-economic inequalities and social determinants of health such as education, occupation, caste, income, gender, ethnicity / race, geographical location and socioeconomic and political context (Governance, Macroeconomic, Social & Health Policy, Cultural and Societal Norms and Values). Therefore, maternal morbidity and mortality is the result of complex interaction between health and socio-economic and developmental factors. 'Social Determinants of Health' framework addresses the issues of social justice and health equity and adoption of human rights frameworks as vehicles for enabling the realization of health equity, wherein the state (political leadership) and other related actors (health care providers) are the primary

responsible duty bearers. In this context, xiii this study tries to understand social determinants of (maternal) health care utilization and human rights violation, if any.

Fertility by Level of Education of the Women

Education, more precisely the female education, has a direct impact on fertility. To ascertain levels of fertility by educational status of the women the indicators viz. age-specific fertility rate and total fertility rate by educational status of the women have been worked out separately for rural and urban areas. Table 24 presents the national level age specific fertility rates by level of education of women separately for rural and urban areas. The data reveals marked rural-urban differences with the rural areas generally reporting higher levels of fertility than the urban areas for all age groups. Fertility attains the peak in the age-group 20-24 years both in the rural and urban areas except for the women having education level 12th and above where fertility attains the peak in the age group 25-29. 'Illiterate' women have higher levels of age-specific fertility rates both in the rural and urban areas than the 'literate'. Within the 'literate' group there is a general decline in the fertility rates with the increase in the educational status both in the rural and urban areas, barring a few exceptions.

Total fertility rates by education levels of the women for India and bigger states are presented in the Table below. At the national level, total fertility rate for the women having educational status 'Illiterate' for 2013 is 3.1. This is much higher than the 'literate' group of women. Among the 'literate' (2.1), there is a gradual decline of TFR with the increase in the level of education.

TABLE 5

TOTAL FERTILITY RATE BY LEVEL OF EDUCATION OF WOMEN, INDIA AND BIGGER STATES

India and bigger states	Educational level of women								
	Illiterate	Literate							
		Total literate	Without any formal education	Below primary	Primary	Middle	Class X	Class XII	Graduate & above
India	3.1	2.1	3.2	2.8	2.5	2.2	1.8	1.6	1.7
Andhra Pradesh	1.7	1.9	2.1	2.4	2.1	2.1	1.9	1.1	1.6
Assam	3.7	2.0	3.4	2.6	2.6	2.2	1.7	1.2	1.1
Bihar	4.4	2.5	3.3	3.0	2.6	2.7	2.0	1.3	1.7
Chhattisgarh	3.1	2.6	3.9	3.2	3.2	2.8	2.1	2.0	1.4
Delhi	2.8	1.6	2.0	2.2	2.1	1.9	1.5	1.2	1.3
Gujarat	3.2	2.1	3.9	3.4	2.5	1.9	1.6	1.2	1.4
Haryana	2.9	2.1	2.9	2.5	2.4	2.4	1.8	2.0	2.0
Himachal Pradesh	1.6	1.7	1.5	2.8	1.5	1.5	1.8	1.8	1.4
Jammu & Kashmir	2.9	1.6	6.2	2.9	2.3	1.9	1.6	1.2	1.2
Jharkhand	3.6	2.2	3.0	2.8	2.3	2.2	1.8	1.8	1.7
Karnataka	2.4	1.9	3.2	2.9	2.5	2.0	1.8	1.5	1.4
Kerala	1.5	1.8	0.2	2.8	1.2	1.6	1.8	2.0	2.3
Madhya Pradesh	3.4	2.8	4.6	4.2	3.5	2.4	2.0	1.6	1.9
Maharashtra	1.1	1.9	3.3	1.4	2.0	2.3	1.9	1.6	1.3
Odisha	2.7	2.0	2.6	2.8	2.3	1.9	1.7	1.5	1.5
Punjab	2.0	1.6	3.6	2.0	1.8	1.6	1.6	1.4	1.6
Rajasthan	3.6	2.5	4.0	3.9	3.0	2.3	1.9	1.4	1.6
Tamil Nadu	0.9	1.8	0.0	1.4	1.6	2.0	1.9	1.6	1.8
Uttar Pradesh	3.9	2.8	4.5	3.7	3.5	3.0	2.2	2.0	2.3
West Bengal	1.7	1.6	1.8	2.4	2.0	1.5	1.4	1.2	1.4

Source: SRS (2013)

MATERNAL HEALTH (UP)

Antenatal care

Antenatal care (ANC) refers to pregnancy-related health care, which is usually provided by a doctor, an ANM, or another health professional. Ideally, antenatal care should monitor a pregnancy for signs of complications, detect and treat pre-existing and concurrent problems of pregnancy, and provide advice and counselling on preventive care, diet during pregnancy, delivery care, postnatal care, and related issues.

Among mothers who gave birth in the five years preceding the survey, 72 percent received antenatal care (ANC) for their last birth from a health professional (37% from a doctor and 36% from an auxiliary nurse midwife (ANM), lady health visitor (LHV), nurse, or midwife). Twenty-four percent did not receive any antenatal care. Among mothers who gave birth in the five years preceding the survey, 80 percent registered the pregnancy for

the most recent live birth. Among the registered pregnancies, 80 percent received a Mother and Child Protection Card (MCP Card).

A little less than half of women (46%) received antenatal care during the first trimester of pregnancy, as is recommended. Only 26 percent of mothers had four or more antenatal care visits. However, both the proportion of women who had their first antenatal care visit in the first trimester of pregnancy for their last births and the proportion of women who received four or more antenatal care visits increased substantially in the 10 years since NFHS-3. A comparative study on the antenatal care between UP and Kerala during the two surveys (NFHS 3 and NFHS 4) is given in the following section with the help of table 6.

TABLE 6
ANTENATAL CARE

	Kerala				Uttar Pradesh			
	NFHS 4 (2015 -16)			NFHS 3 (2005 – 06)	NFHS 4 (2015 -16)			NFHS 3 (2005 – 06)
	Urban	Rural	Total	Total	Urban	Rural	Total	Total
Mothers who had antenatal check-up in the first trimester (%)	96.1	94.2	95.1	91.9	61.1	41.7	45.9	25.7
Mothers who had at least 4 antenatal care visits (%)	88.4	91.7	90.1	93.0	43.3	21.7	26.4	11.1
Mothers whose last birth was protected against neonatal tetanus ⁷ (%)	96.1	96.7	96.4	88.7	88.5	86.0	86.5	64.5
Mothers who consumed iron folic acid for 100 days or more when they were pregnant (%)	69.6	64.9	67.1	70.1	20.2	10.9	12.9	6.0
Mothers who had full antenatal care (%)	63.0	59.5	61.2	66.7	13.5	3.8	5.9	2.7
Registered pregnancies for which the mother received Mother and Child Protection (MCP) card (%)	82.0	86.1	84.2	Na	72.3	81.9	79.8	Na

Source : NFHS 3 (2005-06) and NFHS 4 (2015-16)

While the increase in the mother's who had antenatal check up in first trimester in Kerala showed a slight increase from 91.9 in NFHS 3 to 95.1 in NFHS 4, UP registered a remarkable increase from 25.7 to 45.9 during the same period. Also the urbanites in UP made use of their facilities much higher compared to rural women, but there is not much difference between urban and rural folks in Kerala. Same in the case with mothers who had at least 4 antenatal care visit. There is a steady increase from 11.1 percent in NFHS 3 to 26.4 in NFHS 4 in UP, However in Kerala there was slight decline from 93percent to 90.1 percent during the same survey period. Mothers whose last birth was protected against neo natal tetanus seems to be encouraging. The awareness created through media and other sources make women to take up such preventive measures to protect their new born. In both the states it was above 85 percent during the 4th survey.

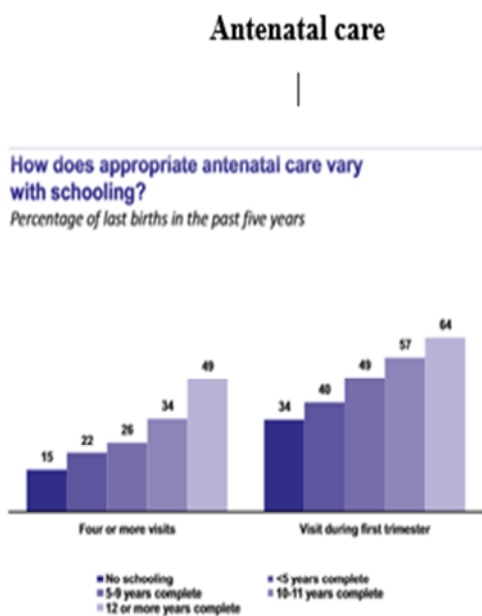
Mothers who consumed folic acid for 100 days or more when they were pregnant revealed their knowledge and desire for having a safe motherhood and healthy baby. While the percentage in Kerala it was nearly 100 percent in Kerala it was only 12.9 percent in UP during the 4th survey. In the case of rural women it was very low. This may be due to aversion of taking medicine during pregnancy or fear that something might happen to them or the baby if tablets are taken. Lack of awareness, illiteracy, customs and traditions may be the reasons for not taking medicines during pregnancy.

Child protection card.....

Is a Recording cum Counseling Card for pregnant & postpartum women and under-five children Will gradually replace Immunization Card Developed Jointly by MWCD, MHFW, with support from UNICEF & NIPPCD Originally used by ICDS in some states, now adopted by NRHM/RCH State has made few alterations like adding a counterfoil.

This is something which was done during the 4th survey. A good number of mothers had received their card. Nearly 82% in urban and 86% in rural area of Kerala had received this card and in UP the percentage was 72.3% and 81.9% respectively. For 63 percent of their last births, mothers received iron and folic acid (IFA) supplements, but only 13 percent consumed them for the recommended 100 days or more. Eighty-seven percent of last births were protected against neonatal tetanus through tetanus toxoid vaccinations given to the mother. Only 8 percent of mothers took an intestinal parasite drug during pregnancy.

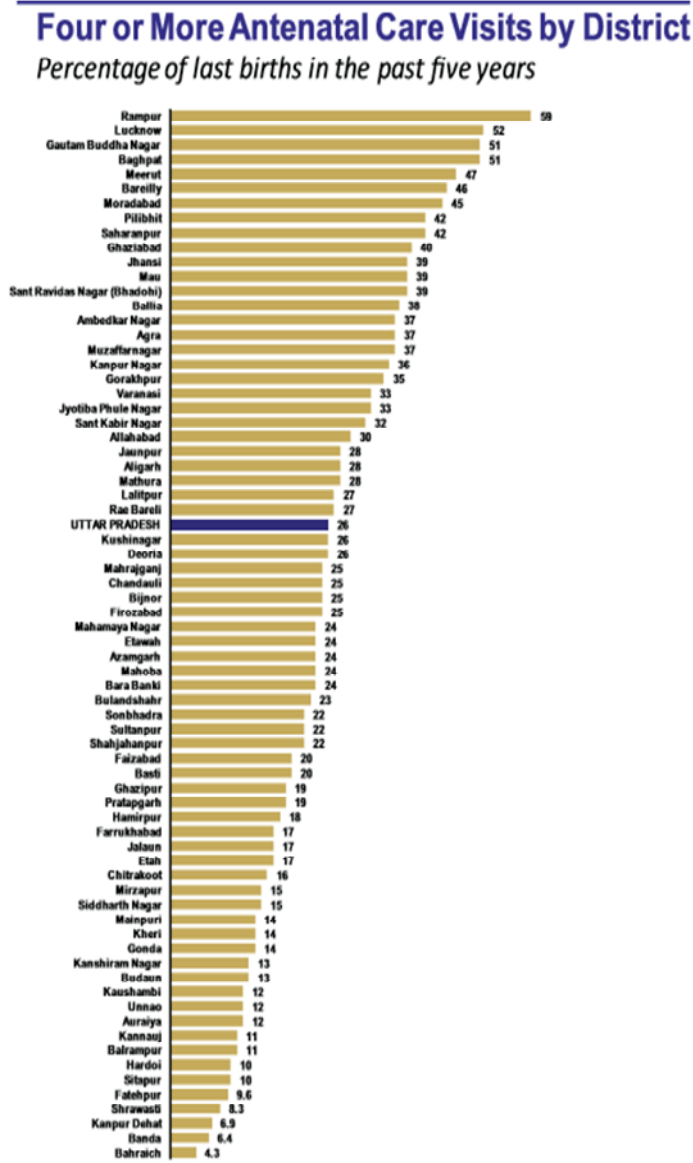
FIGURE 3
ANTENATAL CARE



Among women with a live birth in the five years preceding the survey who met with a community health worker in the last three months of pregnancy for their most recent live birth, at least two-fifths received advice on each of the five different areas (63% received advice on the importance of institutional delivery, 56% on breastfeeding, 48% on cord care, 47% on keeping the baby warm, and 43% percent on family planning).

FIG 4

FOUR OR MORE ANTENATAL CARE VISITS BY DISTRICT IN UTTAR PRADESH



Even when women receive antenatal care, sometimes they do not receive all the services needed to monitor their pregnancy. In Uttar Pradesh, at least three-fifths of women who received antenatal care for their last birth received each of the services needed to monitor their pregnancy: having their weight taken, their blood pressure measured, and a blood sample taken (63% each), having a urine sample taken (65%), and having their abdomen examined (80%).

An ultrasound test was performed during 45 percent of pregnancies in the five years preceding the survey. Women with at least 12 years of schooling were much more likely to have an ultrasound test (70%) than women with no schooling (30%). Pregnant women with no sons were much more likely to have an ultrasound test than those with at least one son. For example, women with two children and no sons who had an ultrasound test during their next pregnancy were more likely to have a son as a daughter for their third child. These results indicate that sex-selective abortion is common in Uttar Pradesh.

Maternal Health (Kerala)

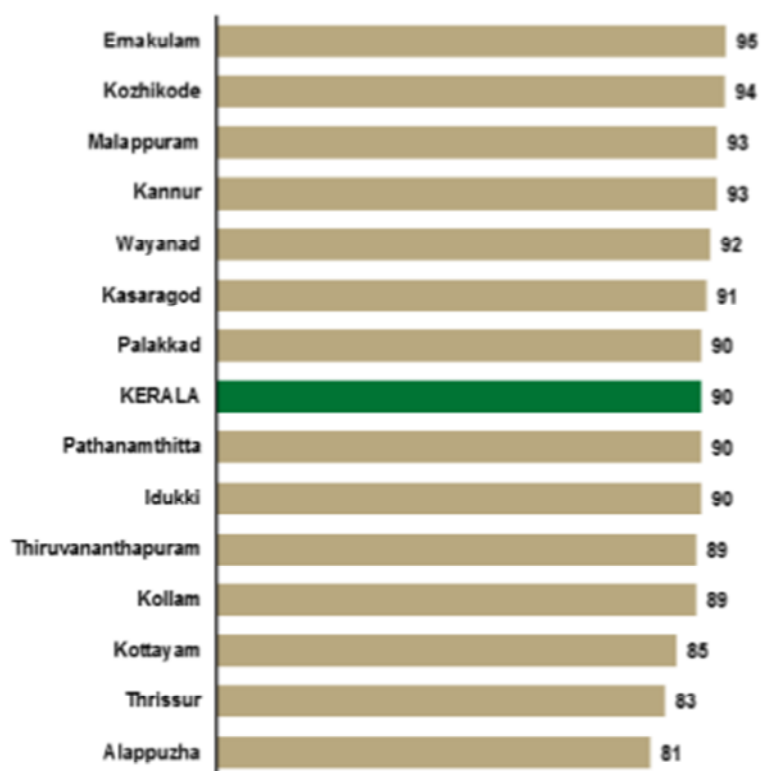
Antenatal care Almost all mothers who gave birth in the five years preceding the survey received antenatal care (ANC) for their last birth from a health professional (99% from a doctor and less than 1% from an auxiliary nurse midwife (ANM), lady health visitor (LHV), nurse, or midwife). Less than 1 percent did not receive any antenatal care. Among mothers who gave birth in the five years preceding the survey, about 90 percent registered the pregnancy for the most recent live birth. Among the registered pregnancies, 84 percent received a Mother and Child Protection Card (MCP Card).

FIG 5

FOUR OR MORE ANTENATAL CARE VISITS BY DISTRICT IN KERALA

Four or More Antenatal Care Visits by District

Percentage of last births in the past five years

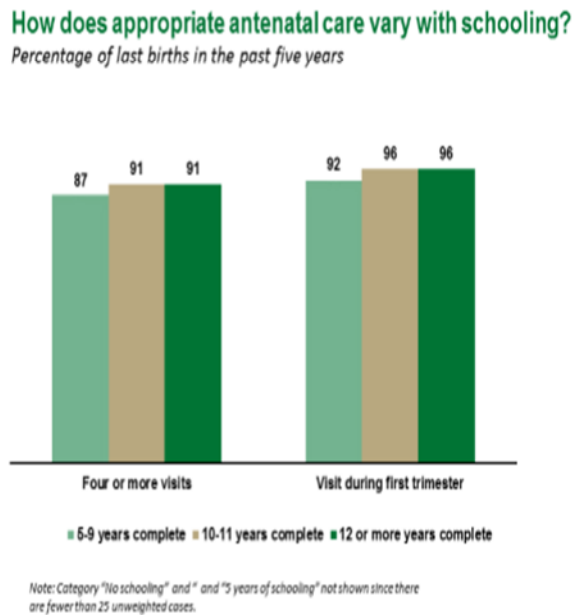


Ninety-five percent of women received antenatal care during the first trimester of pregnancy, as is recommended. Ninety percent of mothers had four or more antenatal care visits. For 96 percent of their last births, mothers received iron and folic acid (IFA) supplements, but only 67 percent consumed them for the recommended 100 days or more.

Ninety-seven percent of last births were protected against neonatal tetanus through tetanus toxoid vaccinations given to the mother. Twenty-one percent of mothers took an intestinal parasite drug during pregnancy.

FIG : 6

ANTENATAL CARE VARY WITH SCHOOLING



Even when women receive antenatal care, sometimes they do not receive all the services needed to monitor their pregnancy. In Kerala, however, 99 percent of women who received antenatal care for their last birth received each of the services needed to monitor their pregnancy: having their weight taken, having their abdomen examined and blood pressure measured, having a urine sample taken, and having a blood sample taken.

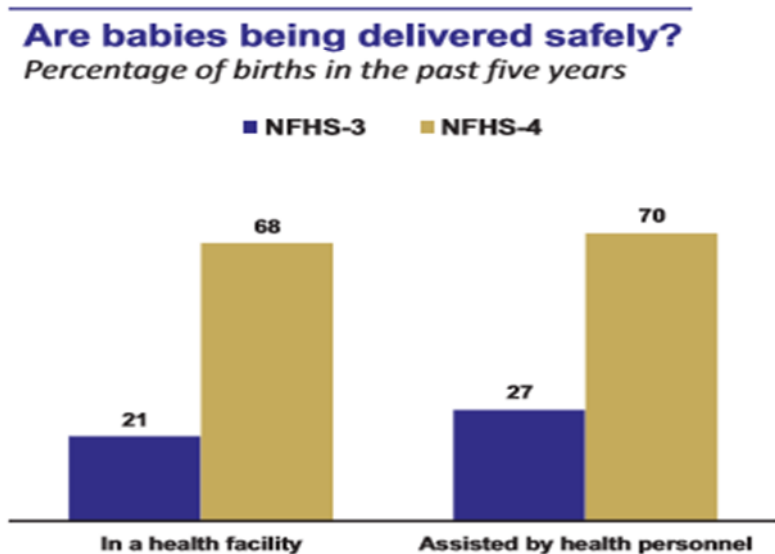
An ultrasound test was performed during 96 percent of pregnancies in the five years preceding the survey. Because ultrasound testing is nearly universal, there was little variation in the prevalence of ultrasound by background characteristics.

Delivery care (UP)

Sixty-eight percent of births take place in a health facility (mostly a government facility) and 32 percent take place at home. The percentage of births in a health facility more than tripled in the 10 years between NFHS-3 and NFHS-4, from 21 percent in NFHS-3 to 68 percent in NFHS-4. Institutional births are more common among women who have received an antenatal check, women with 12 or more years of schooling, women who are having their first birth, Sikh women, and women who do not belong to scheduled castes, scheduled tribes and other backward classes.

FIG: 7

DELIVERY CARE IN UTTAR PRADESH



For almost all home births (98%), a clean blade was used to cut the cord, as is recommended. A disposable delivery kit was used for 33 percent of deliveries. Seventy-four percent of home births followed the recommendation that the baby be immediately wiped dry and then wrapped without being bathed first.

Seventy percent of births during the past five years took place with assistance from a skilled provider, and another 16 percent were delivered by a traditional birth attendant. Additionally, 12 percent of the births were assisted by friends or relatives.

Nine percent of births during the past five years were delivered by caesarean section. Fifty-five percent of caesarean sections (5% of all births) were emergency caesarean sections.

Among women who had a live birth in the five years preceding the survey that was delivered in a health facility, 49 percent received financial assistance under the Janani Suraksha Yojana (JSY) for their most recent birth. Rural women were more likely than urban women to receive financial assistance under JSY. Scheduled caste women were more likely than any other caste/tribe group of women to receive financial assistance under JSY. Women with no schooling or with less than five years of schooling were much more likely than women with at least 12 years of schooling to receive financial assistance under JSY.

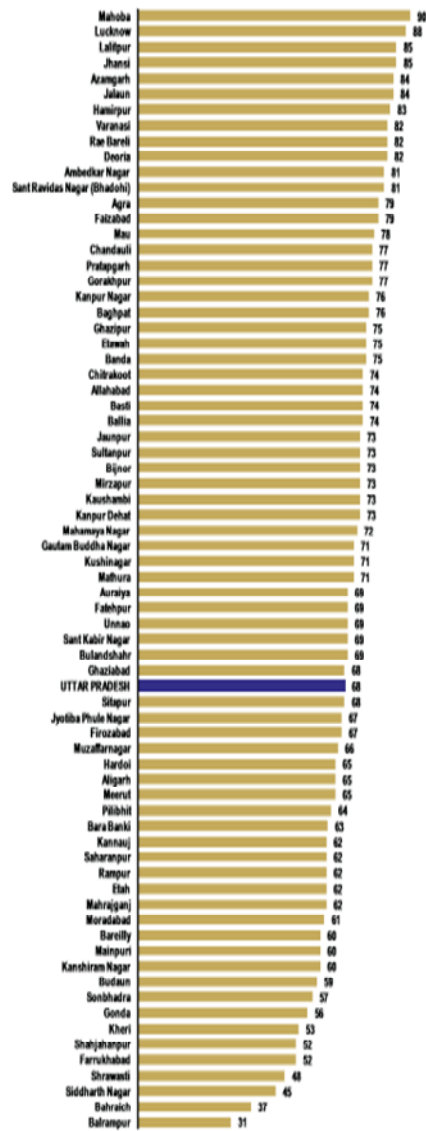
FIG 8
INSTITUTIONAL DELIVERY IN UTTAR PRADESH

Formatted: Centered

Formatted: Indent: Left: 0"

Institutional Delivery by District

Percentage of births in the past five years



Delivery care (Kerala)

Almost all the births in Kerala take place in a health facility, mostly a private health facility (62%). Health facility births were also almost universal at the time of NFHS3. The universality of institutional births cuts across all the background characteristics of women including their birth order, years of schooling, caste, religion, and urban-rural residence. All the births during the past five years took place in a health facility with assistance from a skilled provider. More than one-third of the births (36%) were delivered by caesarean section, and 36 percent of caesarean sections (13% of all births) were emergency caesarean sections. Among women who had a live birth in the five years preceding the survey that was delivered in a health facility, 20 percent received financial assistance under the Janani Suraksha Yojana (JSY) for their most recent birth. Scheduled caste women were much more likely than any other caste/tribe group of women to receive financial assistance under JSY, and Hindu women were more likely than Muslim or Christian women to receive financial assistance under JSY.

The following table depicts the details:

TABLE 7

DELIVERY CARE

Formatted: Centered

	Kerala				Uttar Pradesh			
	NFHS 4 (2015 -16)			NFHS 3 (2005 - 06)	NFHS 4 (2015 -16)			NFHS 3 (2005 - 06)
	Urban	Rural	Total	Total	Urban	Rural	Total	Total
Institutional births (%)	99.8	99.9	99.8	99.3	71.7	66.8	67.8	20.6
Institutional births in public facility (%)	35.6	40.8	38.3	35.6	30.3	48.2	44.5	6.6
Home delivery conducted by skilled health	0.1	0.1	0.1	0.1	5.0	3.8	4.1	6.8

personnel (out of total deliveries) (%)								
Births assisted by a doctor/nurse/LHV/ANM/other health personnel (%)	99.9	100.0	99.9	99.4	75.8	69.0	70.4	27.2
Births delivered by caesarean section (%)	37.1	34.6	35.8	30.1	18.9	6.9	9.4	4.4
Births in a private health facility delivered by caesarean section (%)	39.2	38.1	38.6	32.7	37.0	28.1	31.3	26.0
Births in a public health facility delivered by caesarean section (%)	33.5	29.8	31.4	26.0	11.7	3.5	4.7	11.1

Source: NFHS 3 (2005-06) and NFHS 4 (2015-16)

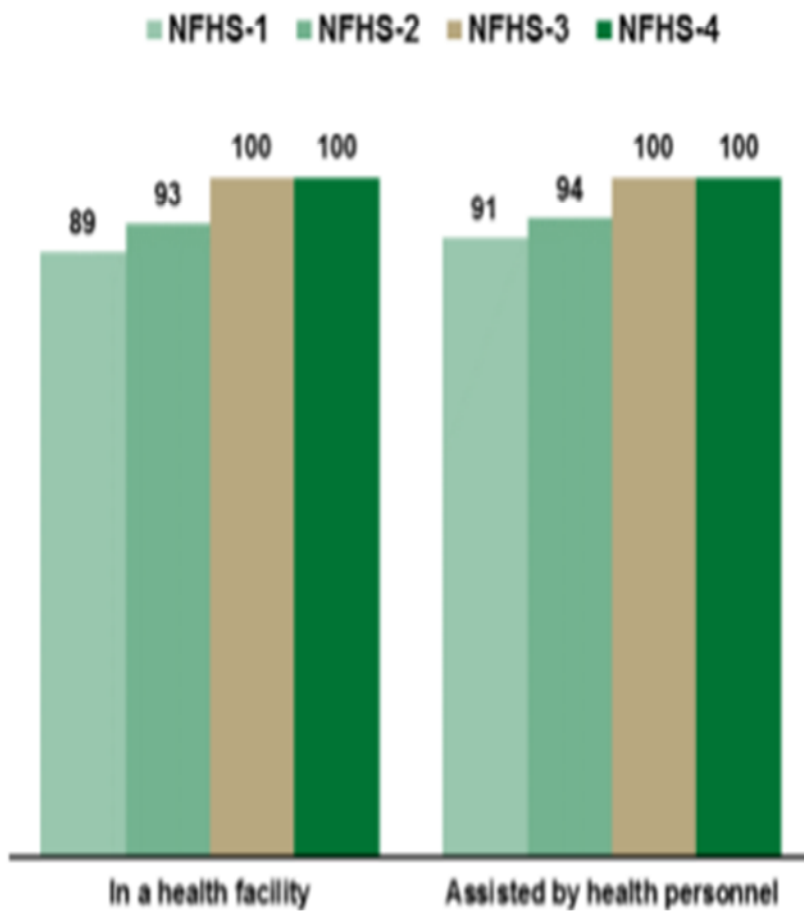
The above said factors are further analysed by taking into account both the Institutional birth has become the order states of the day. The entire women folks prefer to have institutional delivery in Kerala while the care in UP is slightly different. However it was good to notice an increase in institutional delivery increasing from 20.6% in NFHS 3 to 67.8% in NFHS 4 survey. Among them 71.7% were in urban area and 66.8% were in rural are who restored to have institutional delivery. Further institutional birth in public facility was preferred by 38.3% in Kerala and 44.5% in UP. It shows that the rest of the population sought private facility for delivery. It is surprising to note that home delivery still takes place in certain areas in UP. Nearly 7% of the women in UP had have delivery assisted by skilled health person during NFHS 3 it was reduced to 4 % during NFHS 4 .In Kerala the percentage is only 0.1 which is negligible. Save women are still shy to face doctors during their delivery. They still cling in to the traditional practices of delivery conducted by Ayyas or any bhai's who is responsible for carrying out delivery in certain areas. The deliveries assisted by Doctors, Nurses or any other health personnel was out per cent in Kerala, throughout the study period, it was only 27.2 during NFHS 3 in UP which increased to 70.4 in NFHS 4.

It is widely reported that most of the deliveries are through caesarean specially in urban areas. Kerala seems to have a higher percentage of women who had to go for caesarean, while the rate in UP is less.

FIG 9
DELIVERY CARE IN KERALA

Are babies being delivered safely?

Percentage of births in the past five years



Postnatal care

Postnatal care refers to the care a mother and the infant receive during the first two weeks after delivery. Postpartum check-ups within two months after delivery care important for births that take place in non-institutional settings.

The child mortality and their survival highly depend on mother's health and the awareness about breast feeding, nutrition, hygiene, immunization, Vitamin A, diarrhoea, supplementary feeding, contraception, ICDS, reproductive health etc.

TABLE 8
POSTNATAL CARE

	Kerala				Uttar Pradesh			
	NFHS 4 (2015 -16)			NFHS 3 (2005 -06)	NFHS 4 (2015 -16)			NFHS 3 (2005 -06)
	Urban	Rural	Total	Total	Urban	Rural	Total	Total
Mothers who received postnatal care from a doctor/nurse /LHV/ANM/ midwife/other health personnel within 2 days of delivery (%)	87.6	89.6	88.7	84.6	62.9	51.6	54.0	12.3
Mothers who received financial assistance under Janani Suraksha Yojana (JSY) for births delivered in an institution (%)	19.1	21.5	20.4	na	26.3	55.4	48.7	Na

Average out of pocket expenditure per delivery in public health facility (Rs.)	6,848	6,944	6,901	na	2,419	1,879	1,956	Na
Children born at home who were taken to a health facility for check-up within 24 hours of birth (%)	-	-	-	-	1.1	0.7	0.8	0.1
Children who received a health check after birth from a doctor/nurse /LHV/ANM/ midwife/other health personnel within 2 days of birth (%)	48.0	50.1	49.1	na	32.6	22.1	24.4	Na

Source NFHS 3 (2005-06) and NFHS 4 (2015-16)

Some of the postnatal care in the form of mothers who received help from Doctors, Nurse, financial assistance; and new borns which received health etc.; is indicated in the above table. There is vast difference between the two selected states in terms of mothers who received PNC from a Doctors within 2 days of delivery. In Kerala nearly 89% women received this while in UP it was only 54% of the women who received PNC during NFHS 4. However their was much better compared to the figure in NFHS 3 which was only 12.3%. At least to that

extent there is an awareness among women to make use of healthcare. Again it is the urban women who had the privilege of using PNC compared to rural women in UP. In Kerala there is not much difference diet urban and rural in terms of availing PNC.

In these days when medical science has advanced tremendously, the doctors ensure that every new born child should get health check UP and several other inspection. No child is spared in a private clinic without under going lots of tests and check ups. In govt.hospital they don't make it compulsory, but still educated parents would like to give such tests to the new borns. As per the data available in Kerala 49.1%. Children received health check up after birth from a Doctor within 2 days of birth, this percentage was only 24.4% in UP during the NFHS 4. An interesting fact is that in Kerala it is the rural women who had made use of their facility of makeup children to receive health check-up. This is one sign of development of Kerala women moving forward in many spheres.

Postnatal care (UP)

Early postnatal care for a mother helps safeguard her health and can reduce maternal mortality. In Uttar Pradesh, 62 percent of mothers had a postnatal check after their last birth and 59 percent of mothers had a postnatal check within two days of the birth, as is recommended. Postnatal care is most common following births in a medical facility. Sixty-nine percent of births in public health facilities and 83 percent of births in private health facilities were followed by a postnatal check for the mother within two days of birth, compared with only 23 percent of home births.

Twenty-eight percent of last births in the five years preceding the survey received a health check in the first two days after birth. Only 18 percent of home births received a health check in the first two days after birth.

Postnatal care (Kerala)

Postnatal care early postnatal care for a mother helps safeguard her health and can reduce maternal mortality. In Kerala, 93 percent of mothers had a postnatal check after their last birth and 89 percent had a postnatal check within two days of the birth, as is recommended. Forty-nine percent of last births in the five years preceding the survey received a health check in the first two days after birth and 49 percent of newborns either did not have any health check-up or had it after a week.

CHAPTER – V

SUMMARY AND CONCLUSION

The status of health is an important indicator reflecting social development and the quality of human life. Maternal health is an important aspect for the development of any country in terms of increasing equity and reducing poverty. The survival and well-being of mothers is not only important in their own right but are also central to solving large broader, economic, social and developmental challenges. Maternal health care services are the initiatives to ensure safe motherhood through promotive, preventive, curative and rehabilitative health care system.

The government of India launched many maternal health care programmes to reduce pregnancy and childbirth complication and maternal death. But unfortunately, the country is far away to reach the millennium development goal till the recent years. With this background the current study “A comparative study on Maternal Health between Kerala and Uttar Pradesh” is taken up with the following objectives:

Objectives

- To study socio-economic background of women in the selected states
- To access the indicators of maternal health in women in terms of Antenatal care, Delivery, Postnatal care in the selected states
- To suggest measures to improve the maternal health

The methodology adopted is as follows. The study made use of details available from NFHS 3 and NFHS 4. Several indicators of maternal health which includes MMR, ANC, PNC and delivery were considered for this study. Women making use of various health facilities during various stages of pre and postnatal care in both the states of Uttar Pradesh and Kerala were taken up. Two leading states Kerala and Uttar Pradesh in India were taken up for the study. The health status of women in Kerala were quite high compared to that of women in Uttar Pradesh. The several indicators like maternal mortality rate, Antenatal care, Delivery care, postnatal care etc. were remarkably on a higher positive scale in Kerala while it is at a very low dismal rate in Uttar Pradesh. It is therefore great importance to analyse the maternal health of women in Kerala and Uttar Pradesh.

The major findings of the study are given below

- Overall socio economic background Kerala is dominating high percentage of literate women compared to those in Uttar Pradesh.
- Almost the entire households in Kerala has electricity connection while in UP it is only 70.9 percent during NFHS 4. In UP while 94.9 percent urban households enjoy their facility in rural it is only 62.3 percent. However the overall performance indicate marked improvement over the previous survey
 - As per the data collected from NFHS, the total Households who had improved drinking water was 69% during the NFHS 3 which increased by 94.3 in NFHS 4. In UP the situation during the same period showed an increase from 93.1 to 96.4%.
 - The awareness created through media and other sources make women to take up such preventive measures to protect their new borns. In both the states it was above 85 percent during the 4th survey.
- The entire women folks prefer to have institutional delivery in Kerala while the care in UP is slightly different. However it was good to notice an increase in institutional delivery increasing from 20.6% in NFHS 3 to 67.8% in NFHS 4 survey. Among them 71.7% were in urban area and 66.8% were in rural are who restored to have institutional delivery. Further institutional birth in public facility was preferred by 38.3% in Kerala and 44.5% in UP.
- There is vast difference between the two selected states in terms of mothers who received PNC from a Doctors within 2 days of delivery. In Kerala nearly 89% women received this while in UP it was only 54% of the women who received PNC during NFHS 4. However their was much better compared to the figure in NFHS 3 which was only 12.3%.

Suggestions

Maternal health is important not only for the women folk but for the entire humanity. Several indicators are pointers which will influence the health of women during and after pregnancy. All this need to be given serious concern because this would help women to achieve better health. The state of Uttar Pradesh which lag behind in several indicators need to improve and this can be done not only through their efforts of the governments but also through the involvement of women and family as such. There should be greater awareness on the part of women and members of the household so as to access the benefits provided by the

government for maternal health. Availability and accessibility go in a great measure to improve the health of the individuals.

The educated women have proved their capabilities in accessing many of the government programmes designed for them. It is therefore the priority concern of the society to educate women. When the women are educated the whole society get its benefit. It was also noticed that the educated women has better hygiene and sanitation and they are able to maintain better health standard for their entire family. The health profile of such households and those states with high literate women is much higher compared to those states with large scale illiterate women. So every effort must be directed towards educated the women and this will help the economy to improve in different areas. Since health is a basic indicator in human development index it should be improved and the government also should give priority to have educated and healthy citizens.

BIBLIOGRAPHY

1. Aadil Sheikh, Jessica Dunphy, Claire Humphries, Christina MacArthur, Semira Manaseki-Holland (2018) **“Maternity handover in Kerala: a cross sectional study”** International Journal of Community Medicine and Public Health Vol.5 (9) pp – 3760 – 3766.
2. Abhilasha Nair, Mohan K Doibale, Venkatesh V Gujrathi, Ismail F Inamdar, Amol D Shingare, Pinkesh S Rajput (2016) **“Study of maternal mortality in a tertiary care hospital in a district of Maharashtra”** International Journal of Medical Science and Public Health Vol 5(9) pp-1851-1854.
3. Ann L. Montgomery, Usha Ram, Rajesh Kumar, Prabhat Jha, for The Million Death Study Collaborators (2013) **“Maternal Mortality in India: Causes and Healthcare Service Use Based on a Nationally Representative Survey”** Vol 9(1) pp-1-11.
4. Aradhana Srivastava, Sanghita Bhattacharyya, Christine Clar, Bilal I. Avan (2014) **“Evolution of quality in maternal health in India: Lessons and priorities”** International Journal of Medicine and Public Health Vol.4 (1) pp – 33 -39.
5. Arvind Sharma, Pritesh Singh Thakur, Pradeep Kumar Kasar, Rajesh Tiwari, Richa Sharma (2014) **“UTILIZATION OF POST NATAL CARE IN TRIBAL AREA OF MADHYA PRADESH: A COMMUNITY BASED CROSS SECTIONAL STUDY”** International Journal of Medical Science and Public Health Vol 3 (10) pp-1266-1271.
6. Atreyee Sinha and Aparajita Chattopadhyay (2015) **“Utilization of maternal and child health care services in North and South India: does spousal violence matter?”** International Journal of Population Studies Vol 2,(2) pp-107-122.
7. Chopra Deepak, Jauhari N, Dhungana H (2018) **“A Study on Utilization of Maternal Health Services and Factors Influencing the Utilization in Urban Slums of Lucknow”** Int J Med. Public Health Vol.8 (2) pp – 77 – 81.
8. Debalina Datta, Pratyay Pratim Datta (2012) **“Maternal Mortality in India: Problems and Strategies”** Asian J Med Res Vol-2(1)pp-34-35.
9. Dewaram A. Nagdeva (2009) **“URBAN-RURAL DIFFERENTIALS IN MATERNAL AND CHILD HEALTHCARE”**Health and Population: perspectives and issues Vol.32 (1) pp - 36 – 46.
10. Digambar A. Chimankar and Harihar Sahoo **“Factors influencing the Utilization of Maternal Health Care Services in Uttarakhand”** Ethno Med Vol.5(3) pp – 209 – 216.

11. Dileep V. Mavalankar, Kranti S. Vora, K.V. Ramani, Parvathy Raman, Bharati Sharma, and Mudita Upadhyaya (2009) “ **Maternal Health in Gujarat, India: A Case Study**” Journal of Health population and nutrition (2) pp – 235 – 248.
12. Dr. S. Chandraleka, M.A., M.Phil., Ph.D. & Dr. M. Rajeswari, M.A., M.Phil., Ph.D (2013) “**A Study on Determinants of Maternal Mortality Rate in Tamil Nadu**” Vol. 13(4) pp – 40 – 47.
13. Gebremichael Kibreab Habtom (2017) “**Factors Affecting the Use of Maternal and Child Health Services in Eritrea**” Journal of complementary Medicine and Alternative Healthcare Vol.2(3).pp – 1 – 14.
14. Ishmael Kalule-Sabiti, Acheampong Yaw Amoateng and Mirriam Ngake (2014) “**The Effect of Socio-demographic Factors on the Utilization of Maternal Health Care Services in Uganda**” African Population Studies Vol.28(1) pp – 515 -525.
15. Jinu Annie Jose, Sonali Sarkar, S. Ganesh Kumar, Sitanshu Sekhar Kar (2014) “**Utilization of maternal health-care services by tribal women in Kerala**” Journal of Natural Science, Biology and Medicine Vol.5(1) pp – 144 – 147.
16. K. Navaneetham,, A. Dharmalingam (2001) “**Utilization of maternal health care services in Southern India**” Social Science & Medicine 55 (2002) pp- 1849–1869.
17. Kranti S. Vora, Dileep V. Mavalankar, K.V. Ramani, Mudita Upadhyaya, Bharati Sharma, Sharad Iyengar, Vikram Gupta, and Kirti Iyengar (2009), “**Maternal health situation in India : A case study** , Journal of Health population and Nutrition Vol.27 (2) pp - 184 – 201.
18. Kumar Chiman Sinha (2014) “**Male involvement and utilization of maternal health services in India**” International Journal of Scientific and Research Publications, Vol 4(11) pp-1-13.
19. Lalit Kumar Rawat, Jang Bahadur Prasad, Prahlad Kumar(2015) “**Maternal Health Care Services and Its Utilization in Bihar, India**” International Journal of Humanities and Social Science Invention Vol.4(1) pp – 73 – 86.
20. Leila Neisani Samani, Tanaz Agha Jamali, Hamidreza Danesh Parvar, Zahra Behboudi Moghadam and Fatameh Agha Hoseini (2017) “**Causes of Maternal Mortality: Autopsy Results**” International Journal of Medical Research & Health Sciences, Vol. 6(4) pp- 66- 70.
21. M. Lijina (2015) “**NRHM Programmes and maternal and child health care service utilization: a study on Kannur District of Kerala**” Indian Journal of Economics and Development, Vol 3 (11), pp-1-5.

22. M. Lijina (2015) **“NRHM Programmes and maternal and child health care service utilization: a study on Kannur District of Kerala”** Indian Journal of Economics and Development, Vol 3 (11), pp-1-5.
23. M. Shanmugam, S. Vadivel, S. Nirmala (2018) **“Scenario and Magnitude of Maternal Healthcare of Women in Papanasam Taluk, Tamil Nadu, India”** IOSR Journal Of Humanities And Social Science (IOSR-JHSS) Vol 23, Issue 8, Ver. 5 PP 61-68.
24. Manju Ara Khatun, Shanzida Khatun (2018) **“Maternal’ Awareness of Antenatal Care on Impact of Mothers’ and Newborn Health in Bangladesh”** Open Journal of Nursing 8,pp- 102-113.
25. Manoj K. Pandey (2009) **“Maternal health and child mortality in Rural India”** ASARC Working paper pp - 2 – 14.
26. Meerambika Mahapatro **“Equity in utilization of health care services: Perspective of pregnant women in southern Odisha, India”** Indian J Med Res 142, pp 183-189.
27. Nadiya Muzaffar (2015) **“Maternal Health and Social Determinants: A Study in Jammu and Kashmir”** Public Health Research 2015, 5(5): 144-152.
28. Nagamani (2014) **“Nutritional Status of Rural Young Women-A Profile”** Vol: 3(2) pp-132-134.
29. Narayana Murthy M. R., Hugara Siddalingappa, Banani Mishra (2016) **“Assessment of utilization of antenatal care services by mothers attending immunization sessions at a primary health centre in Mysore district, Karnataka, India”** International Journal of Community Medicine and Public Health Vol.3(9) pp-2561-2565.
30. Nomita Chandhiok, Balwan S Dhillon, Indra Kambo, Nirakar C Saxena (2006) **“Determinants of antenatal care utilization in rural areas of India: A cross-sectional study from 28 districts (An ICMR task force study)”** The journal of obstetrics and Gynecology of India Vol.56 (2) pp – 47 -52.
31. Padam Singh and R.J.Yadav (2001) **“STATUS OF ANTE-NATAL COVERAGE IN FOUR STATES”** Health and Population - Perspectives and Issues 24(3): 148-156.
32. Parimal Patel, Nilesh Patel, Yash Shah, Jay Patwa, Geeta Kedia (2015) **“Study to assess the extent of maternal health care utilization by women residing in urban slum area in Ahmedabad”** International Journal of Medical Science and Public Health Vol.5(3) pp – 459 – 462.
33. Patil Ramesh S. (2014) **“Study on Trend of Nutritional Status and Health Outcomes of Women”** INDIAN JOURNAL OF MATERNAL AND CHILD HEALTH Vol. 14(2) pp – 1 – 14.

34. Perianayagam Arokiasamy and Jalandhar Pradhan (2012) **“Maternal health care in India: access and demand determinants”** Primary Health Care Research & Development pp- 1 of 21.
35. Priyanka Dixit and Laxmi Kant Dwivedi (2016) **“Utilization of institutional delivery services across successive births in India”** International Journal of Population Studies Vol 2,(2) pp-123-138.
36. Rahiyanath.C and K Gangadharan (2015) **“NRHM AND HEALTH SECTOR DEVELOPMENT: AN INTERSTATE ANALYSIS OF KERALA AND BIHAR”** Journal of Economic & Social Development, Vol. - XI, No. 1 pp-89-96.
37. Rajeev Kumar, Barun Kant Dixit, Vivechana Deora (2016) **“Utilization of antenatal care in rural area”** International Journal of Medical Science and Public Health Vol 5 (12) pp- 2487-2492.
38. Raju Kowsalya, Shanmugam Manoharan (2017) **“Health status of the Indian women- a brief report”** MOJ Proteomics & Bioinformatics Vol. 5(3) pp – 109 – 111.
39. Ranjit KuMaR DeHuRy, janMejaya SaMal (2016) **“Maternal Health Situation in Bihar and Madhya Pradesh: A Comparative Analysis of State Fact Sheets of National Family Health Survey (NFHS)-3 and 4”** Journal of Clinical and Diagnostic Research Vol. 10 (9) pp – 1 -4.
40. Reena Shrivastava, Harish C Tiwari, Renu Sangal (2016) **“A Study on Maternal Mortality in Baba Raghav Das Medical College, Gorakhpur”** Article in Journal of SAFOG pp-294-298.
41. Sajith Kumar Soman, Binu Areekal, Rosin George Varghese, Asha Joan Murali (2017) **“Assessment of maternity care services among pregnant women in a coastal area in central Kerala, India”** International Journal of Community Medicine and Public Health Vol.4(11) pp-4065-4070.
42. Sandeep Kumar Uppadhaya, Suman Bhansali, Sunil Kumar Sivodia, Neha Agrawal, Kapil Garg, Mahendra Singh (2016) **“UTILIZATION OF POSTNATAL CARE SERVICES IN RURAL AREA OF WESTERN RAJASTHAN, INDIA”** National Journal of Community Medicine | Vol 7 (7) pp-569-572.
43. Sandip Kumar, DK Srivastava, Kirti Jaiswal, PK Jain , CM Singh, Vidya Rani (2011) **“A CROSS SECTIONAL STUDY TO ASSESS ANTENATAL COVERAGE AND ANTENATAL HEALTH SEEKING BEHAVIOR IN RURAL ETAWAH”** Indian J. Prev. Soc. Med. Vol. 42 No.3, pp – 288-293.

44. Sanjay R. Quraishi, Anuradha P. Gaydhanker, Girish B. Dhumale (2017) **“Levels and determinants of maternal morbidity in Sangli, Maharashtra, India: a community based study** International Journal of Community Medicine and Public Health Quraishi SR et al. Int J Community Med Public Health.(3) pp-769-774.
45. Sheila C. Vir and Richa Malik (2015) **“Nutrition Situation of Women in India: Current Status, Implications on Child Undernutrition and Challenges Ahead”** Statistics and Applications Vol 13, Nos. 1&2,pp. 71-84.
46. Shinjini Ray, Pravat Bhandari, Jang Bahadur Prasad (2018) **“Utilization pattern and associated factors of maternal health care services in Haryana, India: a study based on district level household survey data”** International Journal of Reproduction, Contraception, Obstetrics and Gynecology Vol.7(3) pp-1154-1163.
47. Simkhada B, van Teijlingen ER, Porter M, Simkhada P (2006) **“Major problems and key issues in Maternal Health in Nepal”** Kathmandu University Medical Journal Vol. 4(14) pp – 258 – 263.
48. Sofia Anwar, Samia Nasreen, Zahra Batool and Zakir Husain (2013) **“Maternal Education and Child Nutritional Status in Bangladesh”**: Evidence from Demographic and Health Survey Data” Pak. j. life soc. Sci. Vol.11 (1) pp-77-84.
49. Sreekumari U., Shilpa Nair (2018) **“Trends in causes of maternal mortality in a tertiary care centre in Kerala, India”** International Journal of Reproduction, Contraception, Obstetrics and Gynecology Vol.7(11) pp-4370-4374.
50. Sruthi M. V., Bablu Raphael (2017) **“A cross-sectional study on utilisation and content of antenatal services among pregnant women in a coastal area of Thrissur district”** International Journal of Community Medicine and Public Health vol. 4(6) pp- 2094-2100.
51. Sultana Jesmin Ahmed, Mir Alam Siddique, Nasima Sultana (2016) **“Maternal mortality: scenario, causes and prevention of the tragedy in Indian context with special consideration to Assam, India”** International Journal of Community Medicine and Public HealthVol.3(5) pp-1334-1340.
52. Tanveer Shafqat, Seemi Fayaz, Rehana Rahim, Shehzadi Saima (2015) **“KNOWLEDGE AND AWARENESS REGARDING ANTENATAL CARE AND DELIVERY AMONG PREGNANT WOMEN”** J. Med. Sci. (Peshawar, Print) Vol. 23, No. 2: pp-88-91.
53. Verma Ashok, Minhas Santosh, Sood Anupa (2008) **“A study on Maternal Mortality”** J Obstet Gynecol India Vol. 58, No. 3 pp-226-229.