CHAPTER I
Introduction and Literature Review

1.1 Introduction
Maternal death is a tragedy for women, their families, and for their communities. The complications that cause the deaths and disabilities of mothers can also affect the infants they are carrying or have given birth. The poor health and nutrition of women and the lack of care that contributes to their death in pregnancy and during childbirth also compromise the health and survival of the infants and children they leave behind.

The low social and economic status of girls and women is a fundamental determinant of maternal mortality. Low status limits the access of girls and women to education and good nutrition as well as to the economic resources needed to pay for health care or family planning services. Some women are denied access to care when it is needed either because of cultural practices of privacy or because decision-making is the responsibility of other family members. Maternal mortality is an indicator of disparity and inequity in access to appropriate health care and nutrition services during pregnancy and childbirth. It also reflects the women’s place in society and their access to social and economic opportunities.

A study to understand the effect of parent's death on child survival in rural Bangladesh found that infants whose mothers died were 25 times more likely to die than their peers whose mother survived (Ronnsmans et al., 2010). Alam et al., 2014 examined the utility of asking respondents about events in their neighborhood as an efficient method for measuring relative rates of rare health events such as maternal
and infant deaths. Most events were more likely to be reported if they were recent. Simulations were used to study the ability of the method to detect differences in maternal mortality ratio. The findings suggest that the Neighborhood Method has potential for monitoring relative differences between areas or changes over time. This raises the possibility for interventions to demonstrate real effects on outcomes such as maternal deaths, where previously this was only feasible by indirect methods (Alam et al., 2014).

1.2 The Level and Trends in Maternal Mortality

The Millennium development goal targets three-quarter reduction in the maternal mortality ratio in India between 1990 and 2015 (UN, 2000). The target of different policy documents of the Government of India is also to reduce the maternal mortality ratio to below 100 per 100,000 live births by 2010 (GOI, 2000; GOI, 2002; and GOI, 2005). Maternal mortality ratio has declined in India from 398 deaths per 100,000 live births in 1997-1998 to 301 in 2001-2003, but it is still very high. In Uttar Pradesh the estimate of maternal mortality ratio was observed to be 517 deaths per 100,000 live births during the period 2001-2003 (RGI, 2006). Also, other available estimates suggest that the level of maternal mortality is more than 600 deaths per 100,000 live births in Uttar Pradesh (Bhat, 2002; Kumar, 2007).

National level estimates of maternal mortality ratio is 424 per 100,000 live births and 540 per 100,000 live births in National Family Health Survey, 1992-93 (NFHS-I) and National Family Health Survey, 1998-99 (NFHS-II) respectively. National Family Health Survey estimates also suggest that rural MMR is much higher than urban
MMR (434 compared with 385 and 619 compared with 267 in NFHS-I and NFHS -II respectively) (IIPS and ORC Macro, 2000).

Maternal mortality level in North-Western states (Haryana, Himachal Pradesh and Punjab) is 289 deaths per 100,000 live births and in southern India is 383 while it is more than 600 in Eastern states (Assam, North-Eastern states and West Bengal) and North-Central zone (Bihar and Uttar Pradesh) (Bhat, 2002).

Based on 2004–2006 Sample Registration System (SRS) national Maternal Mortality Ratio (MMR) estimates of 254 deaths per 100,000 live births, Ann L. Montgomery et al., 2014 estimated rural areas of poorer states had the highest MMR (397) compared to the lowest MMR in urban areas of richer states (115). Further, they 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.

Another study using data from 38 Demographic and Health Surveys found that age pattern of maternal mortality is broadly similar across regions, types of place of residence, and overall level of maternal mortality. A “J” shaped curve, with markedly higher risk after age 30, is evident in all groups. Further, the largest number of deaths occurs in the age group 20-34, largely because those are the ages at which women are most likely to give birth. So efforts directed at this group would most effectively reduce the number of maternal deaths (Blanc et al., 2013).
The recent estimates of maternal mortality ratio (MMR) from sample registration system (SRS) suggest that country level MMR in India has declined from 178 maternal deaths per 100,000 live births during 2010-12 to 167 maternal deaths per 100,000 live births during 2011-13. The state level estimates suggest that MMR in Uttar Pradesh/Uttarakhand has declined from 292 maternal deaths per 100,000 live births during 2010-12 to 285 maternal deaths per 100,000 live births during 2011-13.

1.3 Causes of Maternal Deaths

A recent study in India shows that most of the maternal deaths were attributed to direct obstetric causes (82 percent) and there was no difference in 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. Further, 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 (Ann L. Montgomery et al., 2014a).

Globally, around 80 percent of maternal deaths are the direct result of complications arising during pregnancy, delivery, or, the puerperium. Severe bleeding (Haemorrhage), generally occurring in postpartum period is a single cause which contributes 25 percent of all maternal deaths. Sepsis, which is often a consequence of poor hygiene during delivery or of untreated sexually transmitted diseases, accounts for some 15 percent of all maternal deaths. Hypertensive disorders of pregnancy (convulsions), prolonged or obstructed labour and complications of unsafe abortion
are responsible for 12 percent, eight percent, and 13 percent of all maternal deaths respectively. Approximately 20 percent of maternal deaths are the result of preexisting conditions that are exacerbated by pregnancy or its management (WHO, 1999).

A systematic review by Say et al., 2014 found that between 2003 and 2009, haemorrhage, hypertensive disorders, and sepsis were responsible for more than half of maternal deaths worldwide. More than a quarter of deaths were attributed to indirect causes. These analyses should inform the prioritization of health policies, programmes, and funding to reduce maternal deaths at regional and global levels. Further efforts are needed to improve the availability and quality of data related to maternal mortality.

1.4 Factors Associated to Maternal Mortality

A common assertion in the literature is that the status of women is also related to maternal mortality (Royston and Armstrong, 1989). Low level of education among women, poverty and poor sanitary conditions, high level of fertility and teen age fertility, low level of contraceptive use and low level of utilization of reproductive and child health services are associated with high level of maternal mortality (Choe and Chen, 2006). Ram, 1995 found that when births are restricted to safe motherhood period and at the same time family size is also reduced, maternal mortality rate reduces by almost 50 percent.

Besides the socio-economic factors, some of the other factors that are considered crucial while examining the level and trends in maternal mortality are those associated
with reproductive behavior and access and utilization of maternal health care services (McCarthy and Maine, 1992). Use of health services are considered as a proximate determinant of maternal mortality (McCarthy and Maine, 1992; Jejeebhoy, 1997). A study in Nepal to investigate trends in factors that may be responsible for decline in maternal mortality shows that uptake of all maternity care services improved significantly. This improved utilization of maternity care services seems essential to the decline in maternal mortality in Nepal (Shrestha et al., 2014).

Using unmatched population-based case-control analysis of national datasets, Ann L. Montgomery et al., 2014b compared the effect of health-facility admission on maternal deaths to women reporting pregnancies. Probability of maternal death decreased with increasing skilled attendant coverage, among both women who were and were not admitted to a health-facility, however, the risk of death among women who were admitted was higher than among those women who were not. Subpopulation analysis of obstetric hemorrhage cases and report of ‘excessive bleeding’ in controls showed that the probability of maternal death decreased with increasing skilled attendant coverage.

Access to health care appears to have a significant effect on levels of maternal mortality. Less developed villages have significantly higher maternal mortality than either moderately or well developed villages. It means that maternal mortality is strongly related to amenities and infrastructure available in the village. Maternal mortality levels were high among Scheduled Tribes and Scheduled Castes and low among Muslims (Bhat, 2002b).
1.5 Men’s Role and Health Care Services

According to the ICPD plan of action: “Special efforts should be made to emphasize men’s shared responsibility and promote active involvement in responsible parenthood; sexual and reproductive behaviour including family planning; prenatal and maternal health; prevention of sexually transmitted diseases including HIV; prevention of unwanted and high risk pregnancies; shared control and contribution to family income, children’s education, health and nutrition” (U.N, 1995).

Dyson and Moore, 1983 found that traditional marriage and kinship patterns lead to very different kinds and levels of female autonomy and freedom in the Northern and Southern parts of the country. These marriage and kinship pattern favoring greater female autonomy and lower fertility in the South and lower female autonomy and higher fertility in the North. Given the differences in female autonomy between Northern and Southern cultural areas, a greater degree of health service and family planning utilization was found by women living in the South. Malhotra et al., 1995 also observed a strong relationship between patriarchy and fertility in India. Rahman and Rao, 2004 found that women in Uttar Pradesh have more restrictions placed on their mobility than women in Karnataka. But in Uttar Pradesh Hindu-Muslim differences in every dimension of autonomy are found insignificant (Jejeebhoy & Sathar, 2001).

A study conducted in India highlights the extent to which men justify the central role they play in the life choices of women. A Brahmin woman from Pratapgarh district, Uttar Pradesh says: “In our village, a woman does not have any value, so most of the decisions are taken by men only”. In contrast, Tamilian women are more involved in
decision-making and are also more likely to believe that they are entitled to this authority. A Gounder caste woman from Coimbatore district, Tamil Nadu reports: “We know more about the difficulties of childrearing, we have the ability to think and see, men don't see, so we should take the decision regarding children, thinking that tomorrow our children should not be like us, they should be more than us” (Jejeebhoy and Sathar, 2001). Another study by Khan et al., 1998 shows the male dominance in Uttar Pradesh: A woman says, "It is the husband or elder male members of the family who decide where or to which clinic women should be taken. Women have no freedom in such matters, but men have all the freedom and power to decide”.

The health status of both women and children, particularly female children, suffers in relation to that of males in areas where patriarchal kinship and economic systems limit women’s autonomy (Caldwell, 1986). When a young woman is required to make vital decisions pertaining to her own fertility and human capital investments in her children, she is under the control of the mother-in-law. Women in Uttar Pradesh are dependent on their husbands and older family members for seeking health care (Das Gupta, 1995; Bloom et al., 2001).

A study conducted in Maharashtra concludes that men have very little knowledge about danger signs of emergency obstetric care. Only less than two-fifths of men reported prolonged labour and bleeding during pregnancy as the sign of EmOC (Singh et al., 2004). In contrast, the knowledge of men about complications during pregnancy and delivery seems to be fairly high (Singh, 2007). Another study in Uttar Pradesh shows that husbands know relatively little about reproductive health issues and very few husbands recognize the danger symptoms of pregnancy and delivery, in these
cases their pregnant wives need immediate medical attention (Singh et al., 2006). A study in Nigeria concludes that men with more knowledge about maternal deaths had more favourable attitudes about preventing maternal deaths (Lawoyin et al., 2007). Maternal deaths can be prevented through one of three mechanisms: Prevention of pregnancy, prevention of complications during pregnancy, and appropriate management of any complications that do occur. But if the individuals who have the power to make decisions do not understand when medical attention is needed, women may not get the care they need in time to save their lives.

1.6 Birth Preparedness and Complication Readiness

Birth preparedness and complication readiness (BPCR) is a strategy employed by numerous groups implementing safe motherhood programs; however, the application of the concept is varied and there is no single definition of the terms. Inadequate funds and transport were a key cause of delay in deciding to seek care and in reaching facilities. Therefore, interventions to address these problems included a community loan program and transportation systems (Essien et al. 1997; Samai and Sengeh, 1997). A program focusing on birth planning in Bangladesh defined birth planning as taking a series of steps prior to birth to ensure that a pregnant woman is prepared for normal birth and complications. Key messages included: care for herself during pregnancy and childbirth, to know danger signs, identify a trained birth attendant, prepare for a clean childbirth, know which health facility to go to in case of an emergency, and plan for complications, including savings and transportation (Barbey et al., 2001).
In a program in Uttar Pradesh, community-based workers counselled pregnant women on maternal and newborn care. Four emergency birth preparedness steps were: identifying a health facility, identifying a person to accompany the mother, arranging for transport, and saving money (Rosecrans et. al., 2008). Despite slight differences in these applications of the BPCR strategy, what they all have in common is an emphasis on the “demand side” of the equation, that is, the individual, family and community, or the users of healthcare services. Also, all focus on reducing only the first and second delays: deciding to seek care and reaching care.

To address the “supply side” concept of BPCR can be expanded to the provider, the facility and the policymaker levels. Promoting BPCR among these functionaries can reduce delays in receiving (or providing) appropriate care at the health facility (Maternal and Neonatal Health (MNH) Program). By including these additional levels in birth preparedness and complication readiness, the program recognizes that the factors causing the three phases of delays arise from many different sources, and therefore functionaries across multiple levels of society share the responsibility for preparing for birth and being ready for complications in order to save the lives of women.

A programming tool entitled “Birth Preparedness and Complication Readiness: A Matrix of Shared Responsibility” summarizes actions to prepare for birth corresponding to each level. At the individual level, pregnant women and their husbands can prepare by learning to recognize danger signs that may indicate life-threatening complications for the mother and baby, identifying a skilled provider and a birth location, saving money, and arranging for transportation. Communities and
families can prepare by making arrangements for money, transport, or a blood donor to assist a woman and her family in reaching and receiving care in case of an obstetrical emergency. Facilities can be prepared by having the required equipment, supplies, and support systems available. At the provider level, clinical personnel can prepare themselves by acquiring the necessary knowledge and skills needed to attend to normal childbirth and manage obstetric and new born complications. Policymakers can institute evidence-based healthcare policies and assure adequate funding for maternal and new born healthcare services (JHPIEGO/MNH Program, 2001).

Moran et al., 2006 highlighted the relationship between the elements of birth-preparedness and complication readiness and the use of a skilled provider at delivery. They found that after controlling for average distance to health facility, number of antenatal care visits, education of women, and parity, planning to save money was associated with giving birth with the assistance of a skilled provider. However, knowledge of danger signs, planning for a skilled provider at delivery, and planning for transportation in the case of emergency were not significantly associated with giving birth with the assistance of a skilled provider. Other studies have also examined the relationship between birth-preparedness and complication readiness and use of skilled providers at delivery. A study conducted in rural Uttar Pradesh concluded that promoting emergency birth preparedness in community-based maternal and new born care programs can increase the utilization of skilled birth attendants (Rosecrans et al., 2008). The money saved by a woman or her family can pay for health services and supplies, vital for transport, or other costs such as loss of work. Likewise, if a woman can afford to pay for these costs, she is more likely to seek care (JHPIEGO/MNH Program, 2001). Even when money is available, it can be
difficult to secure transport at the last minute after a complication has occurred. Lack of money and transportation are barriers to seeking care as well as identifying and reaching medical facilities (Thaddeus and Maine, 1994). Many other studies also reveal that long delay in obtaining care during obstetric emergencies contribute heavily to high the maternal death rate. Poor roads, long distance, a lack of vehicles, and lack of family or community planning for getting health care in an emergency were identified as major reasons for delays in obtaining care (Thomas S. et al., 2001; Bhatia J. C., 1993).

Birth preparedness and complication readiness reduces delays in deciding to seek care in two ways. First, birth preparedness motivates people to plan to have a skilled provider at every birth. If women and families make the decision to seek care before the onset of labor, and they successfully follow through with this plan, the woman will receive care before developing any potential complications during childbirth, thus avoiding the first two delays completely. Second, complication readiness raises awareness of danger signs among women, families, and communities, thereby improving problem recognition and reducing the delay in deciding to seek care. Birth preparedness and complication readiness encourages women, households, and communities to make arrangements such as identifying or establishing available transport, setting aside money to pay for service fees and transport, and identifying a blood donor in order to facilitate quick decision making and reduce delays in reaching care once a problem arises. In sum, at the demand level, birth preparedness and complication readiness promotes the use of a skilled provider at birth through increasing demand and improving access.
Emergency birth preparedness has been promoted to address delays in seeking skilled care at birth. However, little evidence is available on birth preparedness in the context of India. The findings from the evaluation of a community-based maternal and newborn care program in rural India to examine the association between birth preparedness and use of a skilled birth attendant reveals that promoting emergency birth preparedness in community-based maternal and newborn care programs may increase the utilization of skilled birth attendants (Rosecrans et al., 2008).

A descriptive cross-sectional study to evaluate birth preparedness and complication readiness among antenatal care clients at antenatal care clinic at Kenyatta National Hospital, Nairobi, Kenya report that 87.3 percent of the respondents were aware of their expected date of delivery, 84.3 percent had set aside funds for transport to hospital during labour while 62.9 percent had funds for emergencies. Level of education positively influenced birth preparedness. Respondent’s knowledge of danger signs in pregnancy was low. Many respondents did not know about birth preparedness and had no plans for emergencies (Mutiso et al., 2008).

Nandan et al., 2008-09 found that husband and in-laws play dominant role in decision-making. Further, significant proportion of mothers hadn’t planned for place of delivery. This finding can be utilized for targeting men in information, education and communication (IEC) activities.

A study to assess the knowledge and practices towards birth preparedness and complication readiness and associated factors among women of reproductive age group in Ethiopia reveals poor knowledge and practices of birth preparedness and
complication readiness. Further, community education about preparation for birth and its complication and empowerment of women through expansion of educational opportunities are important steps in improving birth preparedness. Emphasis should be given to preparation for birth and its complication and health facility must provide information and education to all pregnant women during antenatal care (Muhammedawel & Mesfin, 2014).

1.7 The Delay in Seeking Care

Making decisions about what to do in the event of obstetric complications is a complex process, but in almost all settings, women’s families play a significant, sometimes dominant, role in that process. The husbands or partners of pregnant women are often the decision-makers, especially if the woman is experiencing a life-threatening complication. They are also usually the ones responsible for making financial and logistical arrangements for transfer to an emergency facility (MotherCare, 2000a and 2000b).

Ghebrehiwet & Morrow, 2006 studied the competence and performance of the skilled birth attendants and the quality of normal delivery and emergency obstetric services in Eritrea. The study revealed gaps in the competence and performance of the skilled health workers as well as in the quality of normal delivery and emergency obstetric services in the country and concluded that in order to reduce maternal mortality in developing countries like Eritrea; it is not adequate to just increase the percentage of women who are attended by health professionals, it is also equally important to improve the skills and performance of the available birth attendants.
To be highly effective, the attendant needs to have an enabling environment that includes drugs, medical supplies, and a referral system with doctors providing emergency obstetric care (Graham, Bell, and Bullough, 2001). In every state of India, most of the first referral units do not have emergency obstetric care drug kit (Ram et al, 2006). In order to use the secondary level obstetric care, however, women their families and their primary care providers must recognize the early signs of obstetric complications; quickly decide to take the woman to an adequate health facility; know the location of health facility; and have access to rapid transportation facility. Trained health personnel at the peripheral health facilities can help in early recognition of danger signs, as well as in proper referral of the women in need of emergency care to a secondary care hospital (Midhet F. et al., 1998).

A study conducted in southern India reveals that 22 percent of the “avoidable” maternal deaths were attributed to lack of prenatal care, while about 75 percent of these deaths were attributed to poor accessibility of emergency obstetric care. The same study found that maternal mortality was lower in the villages where a primary health center was located than in the villages having no such facilities (Bhatia J. C., 1993).

A health worker with midwifery skills present at childbirth, supported by transport in case of emergency referral is required, is perhaps the most critical intervention for making motherhood safer (Starrs, 1997). A study conducted in south India demonstrates that approximately one half of the deaths occurred in the home or on the way to the hospital (Bhatia J. C., 1993). A study conducted in Tanzania reveals that long delay in obtaining care during obstetric emergencies contribute heavily to high
maternal death rate. In the study area poor roads, long distance, lack of vehicles, and lack of family or community planning for getting the health care in an emergency were identified as major reasons for delay in obtaining care (Thomas, et al., 2001).

A systematic review identifying facility level barriers to the provision of evidence based maternal health care in developing countries suggest that most commonly cited barriers were inadequate training/skills; drug procurement/logistics problems; staff shortages; lack of equipment and low staff motivation. Further, this review highlights how a focus on patient side delays in the decision to seek care can conceal the fact that many health facilities in the developing world are still chronically under-resourced and unable to cope effectively with serious obstetric complications. Researchers stressed the importance of addressing supply-side barriers alongside demand-side factors if further reductions in maternal mortality are to be achieved (Hannah E. Knight et al., 2013).

1.8 Need for the Study

Though a number of studies have been carried out in India related to estimation of maternal mortality and maternal health care utilization, limited studies have made an attempt to address the contributing factors to maternal deaths that is also mostly hospital based studies. In many cultures, men or older family members are the major decision makers concerning health issues in the household. However, their limited involvement in activities related to the care of their wives and newborns means that they are uninformed about many details concerning reproductive issues and childbearing. At the same time, reproductive health programs and services have traditionally served women and restricted men's participation. Therefore, in addition
to the causes and contributing factors to maternal deaths, understanding the challenges of enhancing the role of men in different aspects of reproductive health is also very important.

Men’s decisions determine when and where their wives receive assistance in childbirth and determine women’s survival. In north India where women’s autonomy is particularly low, educating and involving men in reproductive health matters may be effective in changing the poor health of women. In particular, the underlying socioeconomic structures such as kinship and marriage allocate power and authority primarily to men; women are dependent on men for access to food, health services and other things that contribute positively to health status. A key problem, however, is that while they may be involved in health care of their partners to varying degrees, they may be largely unaware of basic health issues and needs. Understanding health issues is helpful in making appropriate and timely decisions and taking action when the health or life of a mother may be at risk.

There is lack of data in India to understand male perspectives and the extent of their involvement in maternal health care issues. The large-scale demographic health surveys that mostly rely upon for reproductive health programmes usually ask questions to women only. Men’s perspective of maternal health care is studied extensively; however, limited information is available on men’s perception of maternal mortality. In order to involve men in their wife’s maternal health concerns, an in-depth understanding of the issues and what they do about perceived problems is important. This understanding is important for policy-related decision making that will promote men’s effective participation in activities that advance maternal health.
In addition to contributing factors to maternal deaths, this study also aims to gain a better understanding of the involvement of men in health care issues of their wives, focusing specifically on pregnancy, delivery and postpartum care. Men were asked about their knowledge, attitudes, and behaviour regarding maternal health care issues.

Emergency birth preparedness has been promoted to address delays in seeking skilled care at birth. However, little evidence is available for the effectiveness of birth preparedness in the context of large scale programs. Therefore, to examine the association between birth preparedness and use of a skilled birth attendant, this study has used data collected from the selected district of Uttar Pradesh. The information in this study may be valuable to Indian health policy makers and programme implementers who wish to lower the high maternal mortality.

After reviewing the extant literature these key questions arise:

1. What are the factors that can be taken care of to prevent maternal deaths?
2. What is the impact of program intervention in reducing maternal deaths?
3. Is there any preparedness to tackle the obstetric complications?
4. What do men know about emergency obstetric conditions and to what extent are they involved in the health-seeking of their spouses during obstetric conditions?
1.9 Objectives

The specific objectives of the study are:

1. To examine the causes of maternal deaths and contributing factors to maternal deaths.
2. To examine the impact of program intervention in reducing maternal deaths.
3. To investigate the subject of birth preparedness to tackle the obstetric complications.
4. To study the male perspective of maternal health care and examine the perception/attitude of men towards maternal deaths.

1.10 Organization of the Thesis

In order to carry out the study in accordance with the objectives, the present study has been divided in following chapters.

Chapter I: Introduction and Literature Review

This chapter consists of introduction, review of the literatures on the subject including importance of the study and organization of the thesis.

Chapter II: Data and Methods

This chapter presents information on data sources used for the study. The various analytical approaches used in data analysis are also explained in this chapter.

Chapter III: Causes of and Contributing Factors to Maternal Deaths

This chapter deals mainly with the causes and contributing factors to maternal deaths.
Chapter IV: Impact of Program Intervention on Maternal Deaths

In this chapter an attempt has been made to understand the impact of program intervention on maternal deaths. This chapter solely based on secondary data sources.

Chapter V: Birth Preparedness and Complication Readiness

Birth Preparedness and Complication Readiness (BPCR) is studied in this chapter. The levels and differentials are studied including factors associated with ‘Birth Preparedness and Complication Readiness’.

Chapter VI: Male Perspective of Maternal Health Care and Maternal Mortality

This chapter examines ‘Male Perspective of Maternal Health Care and Maternal Mortality’.

Chapter VII: Summary and Conclusions

This chapter incorporates main findings including summary and conclusions, policy implications and challenges and limitations of the present study.