

*Review Article*

## Maternal Mortality in Nepal: Addressing the Issue

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*Received: 11/11/2012**Revised: 17/12/2012**Accepted: 24/12/2012*

### ABSTRACT

Studies have shown that prenatal care helps to reduce maternal mortality through identification of potential risks earlier, thus, allowing planning for safe delivery. In Nepal, most births take place at home and many, particularly in rural areas do not meet the recommended four prenatal visits. This paper aims to assess utilization and associated factors of prenatal care uptake among Nepali women. This study presents findings from the analyses of Nepal Demographics and Health Survey 2006 data. We used “utilization of prenatal-care by women” as a key factor in maternal mortality. 72.2% of mothers (n= 4182) sought some kind of prenatal-care. Utilization of prenatal-care was associated with many factors: age of mother, level of education, ecological region and place of residence ( $p < .001$ ). Similarly, women’s survival of previous child, knowledge about family planning and abortion, wanted last child, total number of pregnancies, smoking habit, and preparation for delivery were significantly associated with prenatal care ( $p < .001$ ). Our results suggested that there was a huge difference in utilization of prenatal-care among different groups of population. Government and various non-for-profit organizations have carried out interventions aimed at both local and national level to encourage people to seek prenatal care, but outcome has not been as expected. Interventional approaches and policies should be put in place to make reliable prenatal-care easily accessible to disadvantaged groups at free or low cost. Also, authorities need to emphasize not only in implementing of interventional programs but also on keeping track of their success rates and drawbacks.

**Key Words:** Maternal Mortality; Prenatal Care, Public Health; Nepal

### INTRODUCTION

Each year around 358,000 women die because of complications during pregnancy or childbirth and many more encounter serious problems. <sup>[1]</sup> The vast majority of these problems occur in low-income countries, where poverty increases sickness and reduces access to care. These deaths occur within a context of gender-based, economic, political and cultural discrimination and neglect of women’s right

to equal status and equitable access to services. Nearly all of these deaths are preventable because the majority of deaths are caused by hemorrhages, sepsis, hypertensive disorders, prolonged or obstructed labor, and unsafe abortions. <sup>[2]</sup> Despite its recognition as an important and complex health issue, it was not until 1980s that maternal mortality was added onto the international health agenda as a major public health issue. <sup>[3]</sup>

The patterns of maternal mortality (MM) reveal large levels of inequity between and within countries – 99 % of maternal deaths occur in developing countries and only 1 % of deaths in developed countries. <sup>[4]</sup>Sub-Saharan Africa leads this death toll, accounting for 50 % of all maternal deaths worldwide (900 deaths per 100,000 live births), and South Asia accounts for another 35 % (500 deaths per 100,000 live births), which is in extreme contrast with the high-income countries (9 deaths per 100,000 live births). <sup>[5]</sup>Despite the commitment of the international community to reduce MM, the magnitude of the problem remains immense. Thus, the goal of the Millennium Development Goals (MDG 5): Reducing MM by three-quarters by the year 2015 has barely been achieved.

### ***Maternal Mortality in Nepal***

Nepal, a small landlocked country, lies in the central Himalayas, wedged between India and China. With an area of 56,827 square miles and a population of approximately 27 million, Nepal is the world's 93rd largest country by land mass and the 41st most populous country. <sup>[6]</sup> Maternal mortality (MM) is one of the major health issues in Nepal. In 1996, the Nepal Family Health Survey estimated maternal mortality ratio (MMR) to be 539 per 100,000 live births, which was the highest among the South-Asian countries at that time. The Demographic Health Survey (DHS) 2006 showed Nepal's MMR as 281 per 100,000 live births, a decrease by almost 50%. <sup>[3]</sup> For this significant progress and commitment towards improving maternity health goal under the MDG-5, Nepal was honored at the 2010 Millennium Development Goals Review Summit. The MMR was lowest amongst women in twenties, with increased risk for those aged under 20 and between 30-34. The figure for those aged over 35 was considerably higher

(962 per 100,000 live births). There were also differences between ethnic groups, with higher rates among Muslims, Terai /Madhesi and Dalits. <sup>[7]</sup>

Pregnancy and delivery-related causes are among the top ten reasons for MM in Nepal. The main direct cause, hemorrhage, has been dramatically reduced, down from 41% in 1998 to 24% in 2006. The decline reflects a reduction in postpartum (from 37% to 19%), rather than antepartum. The contributions of eclampsia, abortion related complications, gastroenteritis and anemia have increased, while those from obstructed labor and puerperal sepsis have more than halved since 1998. Heart disease accounts for 7%. There was an increase in the proportion of pregnancy related deaths occurring in a health facility, to 41%; with 40% occurring at home; and 14% in transit. In 1998 just 21% of deaths occurred in facilities and 67% at home. <sup>[7]</sup> Many pregnancies were unwanted; suggesting the pregnancy status of the women may have placed them at greater risk. Of the total MM, 39% occurred during the intrapartum period and up to 48 hours afterwards and 61% in the antepartum and postpartum periods suggesting that interventions should focus more on this period. Over 80% of women who died from maternal causes were emergency admissions in a critical state. MM also caused indirectly by hepatitis, diabetes, malaria, infections, malnutrition, and anemia. The indirect causes, though preventable, contribute to about 24% of all maternal deaths in the world. <sup>[8]</sup>

### ***Risk Factors in Nepal***

Traditionally, pregnancy is considered to be natural in Nepal. Thus, regular check-ups are thought to be unnecessary, particularly in rural areas, unless there are complications. One study unveiled that some groups of women in

Nepal do not seek prenatal care (PC) because they think infants were more likely to die if they do so while these infants were in the womb. [3] Such norms were found in other developing countries like Egypt, as well. Women's as well as their families' (especially husbands and mother-in-laws) perception about MHS were averting women from receiving PC, thus, increasing risk of maternal mortality. However, the proportion of mothers who receive PC from skilled birth attendants (SBAs), increased from 24% in 1996 to 44% in 2006. This might be one of the factors for reduced maternal mortality in recent years. [9] Also, life-style and different cultural practices of various ethnic groups in Nepal showed a remarkable impact on MM. For example, Mongoloid women's almost 50% lower probability of dying of maternal causes compared to orthodox Brahmin and Chettri women supports the "women's empowerment" theory strongly. It is not only the high status and autonomy of Mongoloid women but also their late age at marriage, the affection and respect their spouses and family members give them affect their mortality related to reproduction. [3]

Likewise, factors such as early marriages, frequent births, and high parity create health hazards to women. In many rural areas of Nepal, early marriage is customary. Sending young girls off in marriage is a big relief in some cultures such as in the Terai plains of Nepal where dowry and *tilak* are compulsory and the *tilak* amount goes higher as unmarried girls grow older. Marrying early, consequently, conceiving early is taking more lives of women than Nepalese realize. Also, frequent births entail repeated life-threatening processes. Moreover, some reports show that 50% of all maternal deaths in Nepal (where abortion was illegal until September 2002) were due to induced abortion. [3]

Unsafe, unhygienic and sometimes fatal natures of practices conducted by traditional birth attendants were the reasons for maternal deaths in such cases. [10]

Other attributed factors for high MM are the 'three delays' - delay in taking the decision to seek medical assistance, delay in accessing appropriate care and delay in receiving care at health centers. Delay in seeking help due to cultural beliefs, problems of finance, transport, and decision-making has been reported by a number of studies in Nepal. [3] Many Nepalese people, especially in rural areas believe that the complication is created by an evil eye and thus seek help from traditional healers (*Shamans*) before seeking medical help. Also, many women do not seek prenatal care because they are unaware of its benefits. [11] Furthermore, many district hospitals are unable to cope with obstetric emergencies. Among other problems, drugs are not always readily available in the pharmacy and if available, the poor families are unable to buy. In addition, the health care staffs in the rural health posts are often reported as being unreliable, hostile towards local patients, and absent from the care centers; the major probable causes of not seeking medical care by rural women even when medical care was available. [3] Furthermore, most women in rural areas of Nepal are forced to perform daily household chores and fieldwork that demands physical strength. Also, sanitation, a factor that affects MM, is extremely poor in home, where almost all the deliveries take place. [12]

## **MATERIALS AND METHODS**

This study presents findings from the analyses of Nepal Demographics and Health Survey 2006 (NDHS) data. For this study, we used utilization of prenatal care (PC) by women as a key factor in maternal mortality in Nepal. Respondents were asked whether

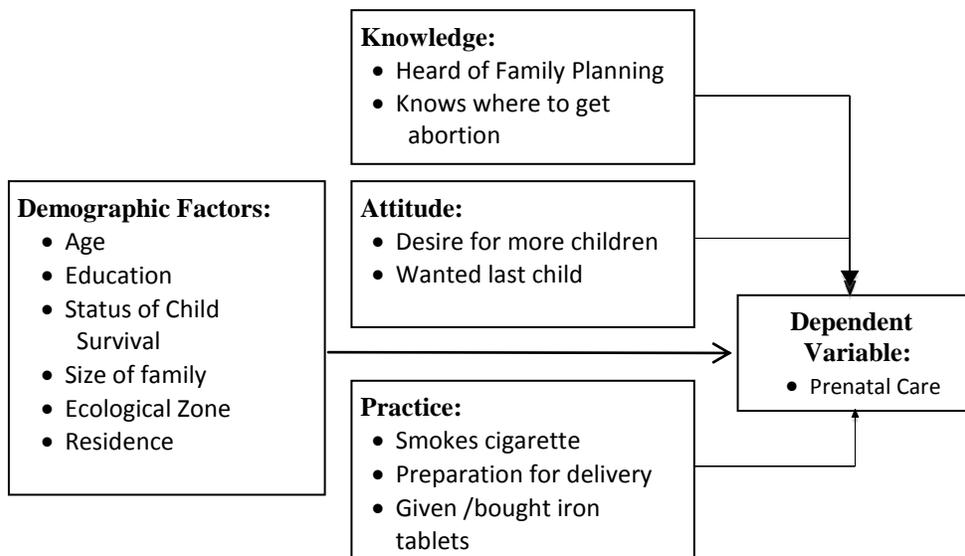
they had seen anyone for PC during the pregnancy preceding each live birth in the last five years. From the database, the variable “PC”, a dichotomous variable with responses “No: did not receive PC” and “Yes: received PC” was used as a dependent variable. Out of 4182 mothers, 1161 mothers (27.8%), did not seek PC whereas the rest, 3021 mother (72.2%) sought some kind of PC. Associations between PC status (received care vs. no care) and four major groups of independent variables (demographic factors, knowledge, attitude and practice) were investigated in the analysis.

Demographics characteristics variables included: mother’s age, type of place of residence, ecological zone, mother’s highest educational attainment, number of household members, religion, and survival status of previous child. Three groups of variables related to Knowledge, Attitude and Practice were analyzed to investigate whether or not these variables have any association with Nepalese women

receiving PC. The first group included variables that measured knowledge status of women, including heard about family planning (through radio, TV or newspaper) and whether or not women know where to get abortion. Opinion of women in terms of desire for more children and whether or not wanted last child were included in the ‘attitude’ group. Smoking habit (including cigarettes, pipe, snuff, chewing tobacco or other), preparation for delivery (including saved money, arranged transportation, bought safe delivery kit, prepared food and clothes), total pregnancies and use of iron/folic acid tablet were included in the ‘practice’ cluster.

All analyses were conducted using SPSS (version 20.0). The chi-square and independent samples t-test were used for association between dependent variable (prenatal care) and independent variables (demographic factors, knowledge, attitude and practice variables). A “*p*” value of less than 0.05 was considered significant.

**Figure 1 - A framework summarizing the factors associated with Prenatal Care.**



## RESULTS

According to Independent samples t-test, there was no significant difference in the mean number of household members between the two PC status groups ( $t(4182)=.307$ ,  $p=.78$ ). However, we observed a significant difference in the mean age of women between the two PC status group ( $\chi^2 = 226.207$ ,  $p<.001$ ). Majority of the women in the age group 20-34 years and younger age group received PC, the highest percentage (82.9%) being in the 15-19 years of group. In contrast, majority of women belonging to 35-39 age group or higher did not receive PC, the highest being 67.9% being in the 45-49 age group.

In the NDHS database, mother's highest educational level is categorized into four categories: No education, Primary, Secondary and Higher. Chi-square analyses showed a significant association between mother's highest educational level and PC status in pf women ( $\chi^2 = 398.20$ ,  $p<.001$ ). Furthermore, the percentage of mothers who received PC showed an increasing trend with increasing level of education. In the four education groups – no education, primary, secondary and higher – the percentage of mothers who received PC were 61.2%, 80.5%, 92.5% and 100% respectively. Hence, only 5.5% of women with higher than secondary level of schooling did not receive PC, in comparison to 82% of women with no education.

Ecological zone (Mountain, Hill, Terai) was also significantly associated with whether or not the women received PC ( $\chi^2 = 117.015$ ,  $p<.001$ ). Mothers who were living in the Mountain region were least likely to receive PC, and those who were living in the Terai Region were most likely to receive PC, with mothers who were living in the Hill region falling in between. 39.2% of women in the Mountain region reported having received no PC in comparison to

32.7% and 20.1% of mothers living in the Hill and Terai region respectively.

There was a stronger significant association between the type of place of residence (urban vs. rural) and PC status ( $\chi^2 = 114.98$ ,  $p<.001$ ). Consistent with what we would expect, a greater proportion (85.5%) of women who lived in the urban region reported having received PC in comparison to 68.1% of women who lived in the rural region. Similarly, survival status of last child was significantly associated with the status of PC among women ( $\chi^2 = 16.18$ ,  $p = 0.<.001$ ). Interestingly, the percentage of women having received PC was greater among those who had the last child alive (88%) than those whose last child was dead (72.8%).

Within 'knowledge' variables, women who had heard about family planning was significantly associated with PC status ( $\chi^2 = 117.67$ ,  $p<.001$ ). As expected, 76.9% of women who said that they have heard about family planning from radio, TV or newspaper received PC, in comparison to 60.1% in women who said that they have not heard about family planning from none of the sources. Similarly, whether or not the women had knowledge about where to get an abortion was strongly associated with PC status ( $\chi^2 = 185.68$ ,  $p<.001$ ). 80.2% of women who were aware of place to have abortion have received PC compared to 64.1% of women who did not know about the place to get an abortion. Furthermore, the proportion of women who reported having received PC was the lowest (57%) when the respondents had no knowledge of where to get an abortion.

In terms of 'attitude', surprisingly, the proportion of women who reported having received PC was higher (83.6%) among women who desired more children after more than two years than those who wanted within two years (67%). The

proportion of women who have received PC was the lowest (55.6%) among women who wanted more children but were unsure about the timing. Contrary to our expectation, women who wanted their last child 'later' (81.3%) had higher proportion to have received PC than women who wanted their last child 'then' (74.4%), whereas, the proportion of having received PC among women who did not want last child was 58.9%.

Similarly, in the 'practice' variables group, total number of pregnancies ( $t(4182)=17.6, p<.001$ ) was significantly associated with PC status of women. Women whether or not smoked ( $\chi^2 = 228.25, p <.001$ ) had strong relationship with the status of PC. The proportion of PC status was much higher among women who did not smoke (77.5%) compared to women who smoked (51.3%). Likewise, preparation for delivery ( $\chi^2 = 268.95, p <.001$ ) for example, saved money, arranged transportation, contacted health worker, found blood donor, bought safe delivery kit and clothes and prepared food, was significantly associated with PC status of women. The majority (83.3%) of women who made preparation for delivery did receive PC, whereas only 60.3% of women who did not make preparation received PC. Also, variable, 'iron/folic acid tableted used' ( $\chi^2 = 252.96, p <.001$ ), showed significant relationship with the PC status. The proportion of use of PC was much higher among women who used iron/folic acid tablet during pregnancy (94.2%) than women who did not use (66.7%).

## DISCUSSIONS

Our results suggested that there was a relatively lower utilization of prenatal care among women, especially, who are of poor socioeconomic status, older age groups, and rural areas of Nepal. The results also revealed a huge gap between uneducated

and educated women. In addition, women who lack knowledge of family planning and women who practice behavior related to unsafe reproductive health were directly linked to have poor use of PC. These imply that providing information on the PC in a simple term or through pictures that enable them to understand easily are important. In addition, women's attitude towards having more children and birth spacing also had significant impact on the utilization of prenatal care. Furthermore, women's habit of smoking, and being prepared for delivery has substantial outcome on use of prenatal care.

A countrywide analysis of 2006 NDHS data showed that perceived barriers to utilization of PC, such as access to MHS, knowledge about PC, family barrier, transportation and the distance to health facility significantly explained why Nepalese women did not receive PC. These results suggest that increasing awareness on PC through mass media and focus groups, educating other influential members in the family (husbands, mother-in-laws) about PC and increasing access to MHS in healthcare facilities may have a significant impact on improving utilization rates for PC.

## *Intervention Plans*

The application of our multilevel intervention designed to increase utilization of PC among women is stratified into two levels 1) Organizational level and 2) Population level. This collaborative interventional approach from both levels will primarily focus on increasing awareness on PC use among women and their families.

Family planning (FP) reduces maternal mortality by enabling women to prevent conception, which in turn eliminates the risk of unwanted pregnancy and mortality related to pregnancy. The USAID-Nepal launched the Nepal Family Health Program in 2001 to increase awareness and

use of FP and MCHS. <sup>[9]</sup> The program selected and trained FCHVs to deliver health education and MHS to women in their communities. CHWs, including FCHVs could play a huge role to mobilize these services into rural areas of Nepal. Another important component of our intervention would be to provide CHWs, including FCHVs, culturally competent trainings to disseminate FP related information and to provide FP services. This would be done in collaboration with organizations involved with MCHS, including Ministry of Health, WHO and other stakeholders. Increased efforts could be made by the government and partners involved to expand cross-cultural and educational trainings for all CHWs, and FCHVs in particular, so as to enhance their effectiveness, credibility and acceptability in various caste and ethnic groups.

Smoking prior to or during pregnancy has been established as one of the risk factors for maternal mortality. Although, only 20% of women are engaged in smoking but the cumulative effect of first- and/or second-hand smoking is significant. <sup>[13]</sup> As a commitment towards reducing effects of smoking, Government of Nepal recently implemented 'Tobacco Control and Regulation Act 2011'. Our intervention could include utilizing narrowcast media to reach population without access to broadcast media; as well as, direct education of mothers, their husbands, their mother-in-laws, and other family members to disseminate anti-smoking messages, announcements, and programs to induce change in behavior and discourage smoking. INGOs/NGOs that are concerned with MCH could assist in this process to reach to greater number of population. We could use street theater performance, a popular form of entertainment in Nepali communities as a means to convey important social messages. INGOs/NGOs could collaborate with local

street performers, or train local amateurs to design and implement community street theater performances that present information messages about the importance of proper utilization of PC. These community street theater performances would be carefully designed to fit within the cultural framework and languages of specific communities.

The lack of trained health care, particularly in rural parts of Nepal has significantly contributed to increased number of maternal deaths. One of the interventional components could include collaborative efforts of mother's group (*Aama Samuha*), NGOs and governmental organizations to provide trainings and financial incentives to the FCHWs, CHWs to provide home-based delivery care, to conduct outreach programs and to recommend proper referral channel. These trained personal will encourage pregnant women and their families (husbands, mother-in-laws) to prepare and to plan for birth, postnatal period and any complications/emergencies that may occur. In addition, trained community leaders in schools, religion, and in vaccination posts and community health posts could also carry out some educational programs. In Nepal, many people follow superstitious beliefs such as the cause for maternal death to be evil spirit (*Bokshi, Bhoot, Pret*). Hence, people tend to prefer traditional healer, who provides them with amulets (*Buti*) to ward off evil spirit. Thus, the MM reduction intervention program could include teaching traditional healers to refer cases of maternal health to area health services. Using their competencies, CHWs could help train traditional healers how to diagnose pneumonia based on clinical signs including counting respiratory rate and using specific cutoff rates by age.

Evidence has shown that MM, which majorly occur due to three delays, result

from a culmination of violation of decision-making and human rights against women and girls. <sup>[14]</sup> Despite the progress that government has made in collaboration with different stakeholders, the larger problem of lack of education and empowerment of women is still an issue in Nepal. Our interventional component could focus on promoting women's decision-making capacity through social mobilization, such as woman-to-woman peer support, testimonials of local people, engaging respected traditional practitioners, and building on benign traditional practices, to increase the priority communities give to pregnancy and childbirth, and their sense of responsibility and obligation. Including household members (husbands, mother-in-laws), local leaders, in galvanizing community action can ensure women's voices are heard, and improve women's access to MCHS. Women representatives in NGOs, women's groups and mothers groups could play an important advocacy role in bringing related policy and program needs to the attention of municipal or VDC representatives at the local governance levels.

Overall, our multilevel interventions to improve proper utilization of prenatal care to reduce MM will focus on increasing public awareness about maternal health and strengthening of facility- and home-based MCH services through community mobilization of trained health workers and use of local narrowcast media such as street theaters to reach to every household. We will also include components of cultural competency, technical skills and educational trainings for all CHWs, FCHVs and other individuals and groups (local volunteers, mothers groups) who are actively involved in the community, to enhance their effectiveness, credibility and acceptability by the community members. We will incorporate influential family members (husbands, mother-in-laws and others)

responsible in women's decision-making and their empowerment in all of our interventions. This process requires long-term time and resource commitment; therefore, collaborative efforts are needed from all stakeholders including individuals, local NGOs, educational institutions, government agencies and international organizations

### ***Generalizability of Interventions***

Maternal mortality (MM) presents a serious threat globally, with the vast majority the problem occurring in developing countries. Unintended pregnancies, socioeconomic variables, and inequalities in access to reproductive and general health care contribute to unacceptably high MM rates in these countries. In recent years, increasing attention has been given to this arena, especially in the context of the UNMDGs. Most of the developing countries like Nepal have similar issues such as lack of decision-making power, educational awareness, trained health personal, excessive physical labor and poor nutrition, which contribute to poor utilization of MHS, thus, increasing the risk of MM.

Several studies have demonstrated the applicability and effectiveness of simple, cost-effective interventions aimed at local level to encourage people to seek prenatal care, thus, decreasing risk during or after birth. For example, Srilanka and Honduras, a low-income country like Nepal, where MMR was well over 500 per 100,000 live births embarked on unique and rigorous community outreach programs and home-based service delivery system by skilled health workers, especially in underserved areas. <sup>[15]</sup> With the benefit of a newly increased public awareness and access to healthcare within communities, both countries were able to remarkably reduce MM. Our interventions in Nepal, which

primarily implements similar approaches focused on population level, using the resources and personals available at community level, will be applicable to other countries, especially in developing countries.

Similarly, in a study by Prata et al. in Sub-Saharan Africa, it was concluded that FP and safe-abortion services saved the most number of lives, followed by PC. In developing countries, at least 200 million women are unable to use FP methods because of lack of access to information and services or the support of their husbands and communities. <sup>[16]</sup> Our intervention, which also focuses on delivering educational awareness to women and their family members about the importance of use of family planning and MCH services, will be significantly useful in other countries, especially developing nations to increase overall utilization of these services and to reduce the risks of maternal mortality.

## CONCLUSION

Maternal mortality is a serious public health problem in other developing countries. More than 80% of these deaths, which are caused by hemorrhage, sepsis, unsafe abortion, obstructed labor and hypertensive diseases of pregnancy, are preventable when there is access to adequate reproductive health services, equipment, supplies and skilled healthcare workers. <sup>[2]</sup> In a developing country such as Nepal, where rural and urban disparities in terms of health facilities and lifestyle are highly polarized, specific community-based programs are needed. Evidences have shown that collective effort of different governmental, and international organizations, education institutions, local NGOs, mothers group, mass media, etc. to implement community-based interventions have been successful to lower maternal deaths. This is possible due to the increased contraceptive prevalence

rate, the decreased anemia among pregnant women because of free distribution of iron capsules, legalized safe abortion, financial incentive for women who deliver babies in health institutions, etc. Also, authorities need to emphasize not only in implementing of interventional programs but also on keeping track of their success rates and drawbacks. Also, special consideration must be given to sustain such programs in the future.

## ACKNOWLEDGEMENT

I would like to acknowledge the support of Dr. Stephen Schensul and Mrs. Pramila Karki.

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How to cite this article: Shrestha R. Maternal mortality in Nepal: addressing the issue. *Int J Health Sci Res.* 2012;2(9):65-74.

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