UNDESIRED PREGNANCY OUTCOMES AND THEIR ASSOCIATED FACTORS IN KWIMBA DISTRICT

BY

BONIPHACE PAULINE MAKELEMO

A dissertation submitted in partial fulfillment of the requirements for the award of the degree of Master of Public health of the University of Dar es salaam.

University of Dar es Salaam

September 2001.

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CERTIFICATION

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DECLARATION

I, Boniphace Pauline Makelemo, hereby solemnly declare that this dissertation is my own original work and that it has never been submitted for a degree in any other University.

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B. P. Makelemo MD (Dar)

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ABSTRACT

Maternal and infant morbidity and mortality are of high priority in health delivery in our setting. Health planners need to identify and take into consideration various factors that influence the morbidity and mortality associated with pregnancy, specifically to their individual communities.

This community based, cross-sectional study was conducted in Kwimba district, Mwanza region, aiming on determining the magnitude of undesired maternal and foetal outcomes of pregnancy and their influencing factors in that district.

The researcher investigated 247 women selected randomly who, at one time or another within the year 2000 had pregnancy. A structured questionnaire was used to collect data on foetal and maternal outcomes, and various factors associated with such outcomes. 13.3% of the pregnancies terminated into various categories for undesired pregnancy outcomes. The perinatal rate and the maternal mortality ratio were higher than those reported by previous studies in Tanzania.

It is recommended that in order to reduce these undesired outcomes of pregnancy and to improve maternal and child care, among other things, quality of care in terms of personnel's knowledge, skill and attitude, equipment and supplies had to be improved. This has to go hand in hand with improvement of referral system, continuous training of TBAs on hygienic methods of delivery, identification and timely referral of at risk mothers before and during delivery. Every community should be involved in designing and planning for logistics that can facilitate timely referral of mothers in danger, the crucial issue being the transportation of the patients.

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LIST OF ABBREVIATIONS

AIDS	Acquired immune deficiency syndrome
AMREF	African Medical and Research Foundation
ANC	Antenatal care
CARE	Cooperation for Assistance and Relief Everywhere
CSPD	Child Survival, Protection and Development
DFID	Department for International Development.of
DHMT	District Health Management Team.
DHS	Demographic and Health Survey
HESAWA	Health through Sanitation and water.
MCH	Maternal and Child Health
MMR	Maternal Mortality Ratio
MPH	Master of Public Health
RVF	Rectal –Vaginal fistula
TANESA	Tanzania- Netherlands Support Programme on AIDS
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VVF	Vesico-Vaginal Fistula
WHO	World Health Organization

1 INTRODUCTION

1.1 . Background information

Reproductive health is one of the components of Primary Health Care package in our country. Further more maternal and infant mortality rates are among the indices used worldwide in assessing health status of a country or community.

Maternal and infant mortality are still of much concern in many of the third world countries both in urban and rural areas. They are the extreme undesired events of pregnancy. Maternal mortality in Tanzania is approximately 100 times higher than in most developed countries (UNDP 1997.) Apart from the maternal and infant mortality, the sufferings associated with pregnancy and childbirth are not well documented. However several studies had shown that the number of women who survive pregnancy complications and suffer chronic ill health is far bigger than the number of those who die. (Maine D. *et al,* 1997)

1.2 Statement of the problem

Literature indicates that maternal and infant mortality rates in our country, like other developing countries are unacceptably high (UNDP 1997)

Various factors, (demographic, social and economic) had been identified to be associated with these high rates. (Juncker *et al,* 1994; Djan, 1997; Becker *et al,* 1993; Thaddeus *et al,* 1994; Leigh *et al,* 1997; Nirupan *et al,* 1995.

Most of the available information in our country on these problems are either health facility based or obtained from few sampled areas, which might not be a good representative of the general population. Contribution of individual factors to the observed results may differ from one community to another in the country due to varying traditions from one place to another.

The estimates of maternal mortality and infant mortality also may differ from one place to another and from one source to another. (Oslen. B.E. et al 2000) There is very little information from community based surveys aimed at estimating the magnitude of undesired pregnancy outcomes at a district level (Ndyetabura, E.F.M. 1990). There is a need to study the individual factors contributing to negative pregnancy outcomes in different societies and districts.

Although reduction in maternal mortality had been given strong emphasis in many of health interventions, the other, usually more prevalent morbidity resulting from pregnancy and labor have not been given emphasis. (Ndyetabura, E.F.M. 1990). Therefore the extent of suffering the mothers and their families experience after birth complications are not well known.

With the current health sector reform, the districts are required to develop and implement proper district health plans based on their individual district situations. In order to do that the District Health Management Teams (DHMTs) need to have strong evidence as to the magnitude of contributing factors to the health problems in the districts. (MOH. 1994)

The above explained background is the basis for the importance of this community based study, conducted in order to identify the magnitude of undesired (negative) pregnancy outcomes and the factors associated with them.

It is expected that this information will be useful to Kwimba district authorities for planing purposes and could sensitize other districts to carry out similar surveys.

1.3 Rationale of the study

Deliberate efforts had been made to obtain accurately the magnitude of such undesired pregnancy outcomes. Majority of the studies done had been health facility oriented. Such health facilities derived data do lack representation of the general population and the whole country, because they may under or overestimate the rates. This study took place at the community level. It is an effort to try to get the extent of different types of undesired pregnancy outcomes in Kwimba district, by Collecting data from the community so as to minimize the biasness of data obtained from the health facilities. It is expected that results from this study will sensitize further studies to be carried out in different districts, in the country. The data will be useful in future plan for effective interventions directed to reduction of maternal and infant/perinatal mortalities and other complications. Also the study will provide baseline information that can be used in monitoring and evaluation of interventions aimed at improvement of maternal and child health within the district.

1.4 Review of Literature

Maternal mortality, infant mortality and other maternal and neonatal health complications result into multiple social and economical effects.

Women are crucial to the social and economic development of their societies as members of the workforce and the backbone of households. They are the creators of new life and the caretakers of daily life. Although saving a woman's life has tremendous benefits for her family and her community, it is the horrible and needless deaths of women themselves that is our call to action. The technology to avert the vast majority of maternal deaths has been known for decades, yet it is still unavailable to large numbers of women in developing countries (Maine D *et al,* 1997)

Despite the fact that it is the most natural of life event, childbirth has always carried the possibility of something going very wrong. General socio-economic development, together with widespread availability of well-organized maternity services have, however, made death of a woman in childbirth a rare event in the developed /industrialized World. It is not so in many other parts of the World where the risk of dying as a result of simply being pregnant can be several hundred times higher.

Maternal death rates remain unacceptably high in many parts of the World. Globally, the World Health Organization (WHO) and united Nations Children's Fund (UNICEF) estimate that every year more than 150 million women become pregnant. Out of these, more than 23 million develop complication that requires skilled

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treatment. In addition diseases such as Malaria Hepatitis, Tuberculosis or Diabetes complicate 12.5 million pregnancies. 585000 women die from causes related to pregnancy and childbirth. The disparity between developed and developing countries is greater than for any other commonly used index of health (Pohjonen, P. 1998). Between 1990-1996, the official estimated facility based Maternal Mortality ratio (MMR) for Tanzania was 200-400 deaths per 100,000 live births. The average official maternal mortality ratio decreased from 450 during Independence to 200 in 1974 where it has since settled.(Pohjonen, P. 1998) The official rates mentioned here differ very much with statistics from other sources of information, making reliability of them questionable. The official rates seem to be lower than those from other reports. The 1997 human Development Report of the United Nations Development Programme (UNDP), gives an estimation of 700 deaths per 100,000 children born alive for Tanzania (UNDP 1997); UNICEF (1998) has estimated 770.

The MMR also differ from one country to another within the developing Countries. In Africa, the WHO has estimated maternal death rates to be over 870 in general, with over 1000 per 100000 live births in Eastern and Western Africa. In one community based study in Gambia, maternal mortality ratio as high as 2716 per 100000 live births was obtained. (Greenwood *et al.*, 1987)

It is estimated that for every woman that dies in labor in developing World, many more find their lives destroyed by terrible injuries. For most of the women the problem is untreated obstructed labour (Pohjonen, P. 1998) Access to modern obstetrical care is only a dream for much of the World and availability of a timely caesarean section is impossibility. The grinding pressure of the foetal head

throughout days of obstructed labor causes interruption of blood flow to pelvic organs, and a whole spectrum of injuries ensues. (Post M.1997).

Some of these complications and sufferings are:

Vesico vaginal fistula (VVF): - The tissue lying between the bladder and the vagina dies from lack of blood supply and a large opening results. This renders the patient totally and permanently incontinent of urine.

Recto vaginal fistula (RVF):- The same process results in a hole between the rectum and vagina and fecal incontinence ensues.

Amenorrhoea: For nearly two thirds of VVF victims, menstrual cycles never resume, and the pregnancy resulting in this obstetrical catastrophe is the woman's first and last.

Vaginal destruction: Loss of blood flow to the pelvis results, for some women result in the total loss of vaginal tissue, and sexual activity becomes impossible.

Foot drop: About 1 in 5 VVF victims suffer damage to nerves supplying muscle in the lower leg, resulting in foot –drop. This severely limits the woman's mobility and ability to perform the tasks associated with daily living.

In many developing –world cultural contexts, the role of the woman is to provide sexual satisfaction for her husband, to produce children, and to do much of the hard labor associated with life in agricultural societies. This spectrum of injuries is cruelly effective in destroying the woman's ability to perform any of these roles, and social meltdown results. These women become social outcasts isolated from family,

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friends, village society, and religious life by a scenario in which they had no active role.

Abortions, stillbirths and Neonatal deaths:

Like maternal complications new born children suffer from problems associated with pregnancy and birth. The birth canal is the shortest distance a human being travels but the most dangerous journey. A number of children live with disabilities particularly brain damage as a result of problems related to pregnancy and childbirth. Between 1990-1996 the neonatal and infant mortality rate for Tanzania is estimated at 32 per 1000 live births and 137 per 1000, respectively. Majority of infant deaths occurring during first month of life mainly result from complication during birth.

Abortions, stillbirths and early neonatal deaths are seldom registered and very little is known about their magnitude. Routine data on pregnancy wastage and perinatal deaths is lacking in Tanzania and even institutional records on this issue are not routinely maintained (Ndyetabura, E.F.M. 1990).

Cultural reservations and practices surrounding abortions, stillbirths or death of a neonate child make gathering of information on such issues specifically difficult as such events are usually secretive affairs of the family and prone to many taboos (Ndyetabura, E.F.M. 1990)

Efforts had been made to study various factors that contribute to high rate of undesired pregnancy outcomes for the aim of designing intervention to reduce them. For a long time there has been an efforts trying to improve the outcomes of pregnancies. One of the efforts made include the development and improvement of

Maternal and child Health (MCH) care services for pregnant and post- delivery mothers. The focus of antenatal care had been on ensuring universal accessibility and increased coverage.

Most pregnant women in Tanzania attend to Antenatal care (ANC) clinics at least once during pregnancy. Studies shown that about 90% of pregnant mothers attend for antenatal care cervices during their pregnancy period. Of those who attend for ANC, trained nurses attend 43% or nurse midwives, while about 40% are attended by MCHA and 7% by doctors. Traditional birth attendants provide antenatal care to about 8% of pregnant women. (UNDP, 1997)

Although nowadays majority of pregnant mothers do attend to health facilities for antenatal care, more than fifty percent deliver at home or to traditional birth attendants due to various reasons. In Tanzania Only 47% of births were delivered in a health facility. Urban births were much more likely to take place in health facilities than rural births (TDHS, 1996). Unfortunately majority of undesired pregnancy outcomes occurring at home or to tradition birth attendants are not reported to health authorities making their accurate documentation difficult.

During antenatal visits pregnant women are supposed to be screened for risk factors, which are associated with maternal and infant morbidity and/or mortality. On screening appropriate steps have to be taken in order to minimize the possibility of the anticipated undesired events. Such steps include haematinics to anaemic mothers, referring of highly risks to high levels of care like at hospitals etc. It has to be noted that all pregnant women are at risk of obstetric complications. Most life –threatening complications occur during labor and delivery, and these cannot all be predicted.

Prenatal screening does not identify all of the women who will develop complications. Women not identified as "high –risk" can and do develop obstetric complications.

Some studies had shown efficiency and effectiveness of screening for at risk pregnancies is questionable for two major reasons. First, many women categorised as high risk never develop complications but consume scarce resources such as hospital deliveries. Second, many women categorised as low risks do develop complications but are never told how to recognise or respond to them (Fortney, 1995;Freedman, 1993). Fortney, in his study reviewed the value of various risk factors in predicting obstetric complications. He viewed obstetric history as a far more accurate predictor of risk than demographic factors. The community characteristic (such as distance to emergency obstetric care, access to transport, availability of food, and work load) should also be considered as risk factors. Risk assessment must be revised throughout pregnancy as women develop new signs and symptoms.

In a study that was conducted in Zaire all pregnant women who came to the clinic were evaluated for risks of developing complications. Women with poor obstetric history were found to be ten times as likely as women without such a history to have obstructed labour. Nevertheless, of 156 women determined to be high risk based on screening, only fifteen (9.6%) actually had obstructed labour. Moreover, those fifteen high risk women ultimately accounted for only 29% of the total cases of obstructed labour at Kasongo. Thus over two thirds of cases of obstructed labour were among the low-risk women who were not and could not have been identified through screening (Kasongo project team, 1984; May Post 1997). According to the literature,

even if the screening of pregnant women for the risks is of optimal level there will still be those who unexpectedly develop complications during or after delivery.

2 OBJECTIVES

2.1 Main objective

To determine the magnitude of undesired pregnancy outcomes and their associated factors in Kwimba district.

2.2 Specific objectives

1) To determine the proportion of pregnant women who had normal live births in Kwimba district from January to December 2000.

2) To determine the proportion of pregnant mothers whose pregnancies terminate before term.

3) To determine the proportion of mothers who develop long lasting birth injuries after delivery.

4) To determine the proportion of mothers who develop sepsis after delivery or abortion.

5) To determine the perinatal mortality rate for Kwimba district for the year 2000.

6) To determine the relationship between pregnancy outcomes and the following factors:

   i) Maternal age

ii) parity

iii) Interval between deliveries

iv) Antenatal attendance

v) Place of delivery

vi) Type of the delivering attendant

vii) Distance from nearest health facility.

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3 METHODOLOGY

3.1 The study area

Kwimba district is one of the seven districts in Mwanza Region. It is a rural district, located southern of the Region. Its boundaries are: Magu and Misungwi districts to the North; Shinyanga rural district to the south; Sengerema and Geita district to the West; and Maswa district to the East. It occupies an area of 3,472 square Kilometers. Administratively it is divided into five Divisions, twenty-five wards and one hundred and eleven villages. Approximately 324,561 populations inhabit this district. Generally the economic status of the population of this district is poor, depending mainly on small scale farming and rearing of animals, mainly cattle, goats and sheep. The methods of rearing the animals and cultivation are that of low scale and low technology. They grow maize, cassava, rice, sorghum and legumes for their food; and cotton as their commercial crop. Frequently their farms experience low productions due to shortage of rainfall.

Health facilities:

There are two hospitals, two health centers and 31 dispensaries. Sumve Designated District Hospital is located at a small town of Sumve, about 30Kms away from the district headquarters (Ngudu town). It is owned by the Catholic church- Mwanza Archdiocese.

The second hospital is located in Ngudu town, where the district headquarters are. It is government owned and it functions as a district hospital. The two health centers are also government owned. Among the 31 dispensaries, two are private owned while the rest are public owned.

Health related projects in the districts include: Health through sanitation and water (HESAWA), Child survival, Protection and Development (CSPD), Tanzania-Netherlands Support Programme on AIDS (TANESA), Cooperation for Assistance and relief Everywhere (CARE) and African Medical and Research Foundation (AMREF)

3.2 Study design

This was a community-based cross sectional study.

3.3 Study population

The study population included all women of reproductive age who had pregnancy that terminated during the period of January-December 2000.

3.4 Sample size estimation

Using the estimation of undesired pregnancy outcomes as the key variable, the sample size for study was estimated by using the following formula:

$n=z2\ p(100-p)/d2$

Where

n=the desired sample size

z= percentage of the standard normal distribution corresponding to 95% confidence interval (For 95% confidence interval z=1.96)

p= expected proportion of pregnancies which end up into undesired pregnancy outcomes (set at 20%)

d = margin of error on p (set at 5%).

Using the above formula the minimum sample size was estimated to be 246 mothers

3.5 Sampling procedure

A multistage random sampling technique was used to obtain the study sample. At the district level, divisions to be studied were selected randomly. All the five divisions were given equal chance of being selected. That is selection of the two divisions among the five divisions was done by using simple random sampling procedure. Then a list of all the wards in the two selected divisions was used as a sampling frame from which five wards were selected randomly by lottery. At the ward level two villages were selected from the sampling frame consisting of all the villages within that ward. This was also done by simple random sampling. The selection of divisions and wards took place at the district headquarters, while selection of villages at ward level took place at the ward headquarters. This was done under supervision of the research assistants who were assigned to conduct the data collection from the respective wards.

This exercise resulted into ten villages being selected for the study. At the village level, a list of households will be obtained from the village head offices. Every household was assigned a number. Using the lottery method, a starting point household was selected. From the starting point, the interviewer surveyed the next nearest household, conducting interview to every woman in that household who in one time during the specified period (January to December 2000 had a pregnancy. In case there was no woman with such criteria in a household no further study on that household and hence the interviewer proceeded to the next nearest household. All women who met the specified criteria from the surveyed households were interviewed separately. This process went on until the required number per village i.e. 25 women was attained. In case the number of mothers to be studied is not attained in a certain village, the nearest village was surveyed to get the remaining number. In case the mother is not available due to death her demographic data and whatever data could be available from a senior member of the family was collected.

3.6 Variables

Dependent variables:

1) Foetal outcomes occurring up to six weeks after termination of the pregnancy.

2) Maternal complications.

Categories of the dependent variable (1) above included: -

- Normal deliveries (Live birth, without complication),
- Abortions
- Still births (macerated or fresh),
- Pre term delivery
- Neonatal deaths

Indicators of the dependent variable number (2) above included history of:-

- Puerperal sepsis
- gynaecological fistula
- uterine prolapsy
- Foot drop
- Severe haemorrhage during pregnancy, delivery or after delivery. (Antepartum haemorrhage and Post partum haemorrhage.)

The independent variables were:

- Age of the mother.
- Parity of the mother
- Place of delivery

- Distance from home to nearest health facility
- Type of delivering attendant
- Interval between pregnancies/ deliveries
- Antenatal attendance
- Level of education of mothers
- Economic status of mothers and their families

3.7 Data collection procedure

Data was collected from respondents by using a structured questionnaire. The questionnaire consisted of both open ended and closed questions. The questionnaire was initially formulated in English. Then it was translated in Kiswahili and then retranslated back by another person from Kiswahili to English. The initial English version was compared with the English translation version and have the same meaning. Before data collection, the questionnaire was pretested by the principal investigator together with the assistants (interviewers). This took place during the training period at Ilumba village, the village nearby Ngudu town. (Kwimba district). After the pretest the necessary amendments were made to get the final version ready for data collection.

Information collected are: - demographic data of interviewee (age, gravidity during the pregnancy to be studied, parity, marital status, e.t.c.); outcome of the pregnancy under study; place of delivery /abortion/termination of the pregnancy; type of the service provider during termination of the pregnancy; gestation age during booking to antenatal clinic (if available); number of antenatal visits before delivery /termination; marital status; occupation of the mother; level of education; social economic status; time interval between the index pregnancy and the previous one.

Information was collected from respondents who were the women who had pregnancy during the year 2000. In absence of the mother (due to maternal death, from pregnancy associated complications), the information was obtained from one of the senior members of that family, preferably one who was present during the time of pregnancy and delivery /termination of that pregnancy, hence expected to have good knowledge about the family, the woman, as well as memory of the events surrounding the pregnancy and delivery/termination.

The principal investigator was the main data collector, being assisted by 4 research assistants. The research assistants were recruited from among the active village health workers (VHWS) who had attended at least eight weeks training as VHWs.

On this exercise the principal investigator used the district authority, specifically the DMO's office in identifying the appropriate candidates.

Before data collection, research assistants was trained on filling the questionnaire properly. The training took place during the preparatory week. The training included familiarization with the research tool (questionnaire), and skill of interviewing, attained practically. The principal investigator was responsible for the training. He also supervised the data collection exercise to make sure that the right and correct data is collected.

3.8 Data management /quality assurance

The principal investigator together with the research assistants did the auditing of the data filled in the questionnaires to ensure their correctness and completeness. Correction of the missing or wrongly filled data was done by going back to the respective respondent whenever necessary.

3.9 Data processing and analysis

Data from the individual questionnaires/research tool were coded and entered into the computer programme using the EPI-INFO programme. Analysis of data and all the necessary calculations and statistical testing were performed using the same programme (EPI-INFO -6). Statistical testing for significance to examine associations were performed using mainly Chi –squared test .The results were considered significant at p-value of less than 0.05 (i.e.$P<0.05$).

3.10 Ethical Considerations

Ethical clearance for this study was be sought from the research and publication committee of MUCHS. Permission to conduct the study in Kwimba district was obtained from the district leaders.

The aim of the study was clearly explained to each of the respondents, and an informed verbal consent obtained from the respective respondents. Each responded was assured of her right to withdraw from the study at any stage of the interview. Also she was assured of confidentiality of information obtained during and after the interview. Identification Numbers and not actual names appeared on the questionnaire. This was one of the strategies towards ensuring confidentiality

3.11 Pretest

Before the actual data collection, the data collection activity was pretested. The pretesting took place during the preparatory week. Ilumba village, which is nearby the district headquarters, where the training of the research assistants was taking place was selected for pretesting. After the pretesting the principal investigator discussed with the research assistants on achievements, and problems encountered. Then the necessary modifications on the data collection tools was made taking into consideration the observations during the pretesting exercise to get the final version of the tools.

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3.12 Definitions:

For the purpose of this study the following definitions are used.

Abortion: included the foetal wastage before 28 weeks. For practical purposes, any heavy bleeding following amenorrhoea of more than six weeks or giving birth to a small baby who is dead or that dies within first 24 hours and the mother considers the size of the baby being the cause of the death were grouped as abortion.

Stillbirth: included delivery of a dead foetus at term. Expression from the mother of a gestation age of 8th to 9th month of pregnancy during delivery was accepted as stillbirth. For this outcome macerated stillbirth and fresh stillbirth were considered differently as their causes may differ.

Pre term delivery: delivery of a live baby before term. Here the expression of the mother regarding the gestation age of less than 9 months during delivery was accepted unless the antenatal card was available for confirmation

Neonatal death: Included death of a baby within four weeks of age.

Maternal death: These included any death of mother during pregnancy up to two months after termination of the pregnancy whether by abortion, or delivery.

Puerperal sepsis: Include any febrile illness accompanied by lower abdominal pain within two months of termination of the pregnancy. This category also include the post abortal sepsis

Gynaecological fistulae: Fecal or urine incontinence following a delivery.

Foot drop: Impairment in lifting the lower limb following difficult delivery.

Perinatal death: death of the foetus or baby from 36 weeks of pregnancy to four weeks after birth.

Post partum haemorrhage: Classically is defined as blood loss per vagina amounting 500mls or more in 24 hours after delivery. Practically was taken as blood loss that can soak 1 khanga.

4 RESULTS

4.1 Socio-demographic characteristics

A total of 247 women participated in the study. All of them except one had one pregnancy in the year of study (i.e. 2000). The exceptional one had two pregnancies during the year. This gives a total of 248 pregnancies being studied through interviewing the mothers. Out of the 247 women who were interviewed about their last pregnancy, their age ranged from 15 years to 53 years, with a mean age of 26.8 years.

Their mean parity was 4, ranging from para1 to para14. The median parity was 3.

Regarding level of education, it was observed that 53 (23.8%) women had no formal education, 185 (74.6%) had primary education, and 4 (1.6%) had secondary education or higher.

Majority (98.8%) of the women were peasants and only a few (1.2%) were employees of different sectors.

Out of the 247 women, 198 (80%) were living with their spouses.

Tables 1 to 5 illustrate the characteristics of the respondents.

TABLE 1: Frequency distribution according to age groups.

Age group	Frequency	Percentages
15-19	29	11.7
20-34	176	71.0
35^{+}	43	17.3
Total	**248**	**100**

TABLE 2: Frequency distribution according to parity

Parity	Frequency	Percentages
1	47	19.0
2 – 7	176	70.2
8^{+}	27	10.9
Total	**248**	**100**

TABLE 3: Frequency distribution according to level of education.

Level of education	Frequency	Percentages
No formal education	59	23.8
Primary education	185	74.6
Secondary education	4	1.6
Total	**248**	**100**

TABLE 4: Frequency distribution of respondents according to occupation

Occupation	Frequency	Percentage
Peasant	245	98.8
Employed	3	1.2
Total	**248**	**100**

TABLE 5: Frequency distribution according to status of living with spouse

With spouse	Frequency	Percentage
Yes	198	80
No	50	20
Total	**248**	**100**

Also four family members were interviewed concerning the 4 mothers who died of maternal complications in that year from the families studied. The ages of the deceased ranged from 28 to 40 years, with mean age of 33 years. Their parity at the time of their death ranged from para 4 to para 9, with mean parity of 6. Education wise, out of them only 1 completed primary school. The other 3 didn't had any formal education. All of them were peasants. Out of the 4 women 2 were married and the other 2 were single. They all attended at least once to ANC.

Regarding the distance from health facility, One of the deceased mothers was reported to have been living within one walking hour distance from the nearest health facility, while 3 others lived within one to two walking hours distance from the nearest health facilities.

4.2 Foetal outcomes of pregnancy

Foetal outcomes of pregnancy were explored and classified into four main categories of normal delivery, premature birth, abortion and stillbirth. Out of the 248 pregnancies studied through interviewing the mothers, 215 (86.7%) pregnancies were carried up to term and terminated as normal delivery without immediate problems. Also the study findings show that 15(6.0%) pregnancies terminated into pre-mature but live births, and 9(6.0%) terminated as abortions before term. Other 9(6.0%) pregnancies were carried up to term but terminated as stillbirths. The figure 1 bellow illustrates the foetal outcomes of pregnancy.

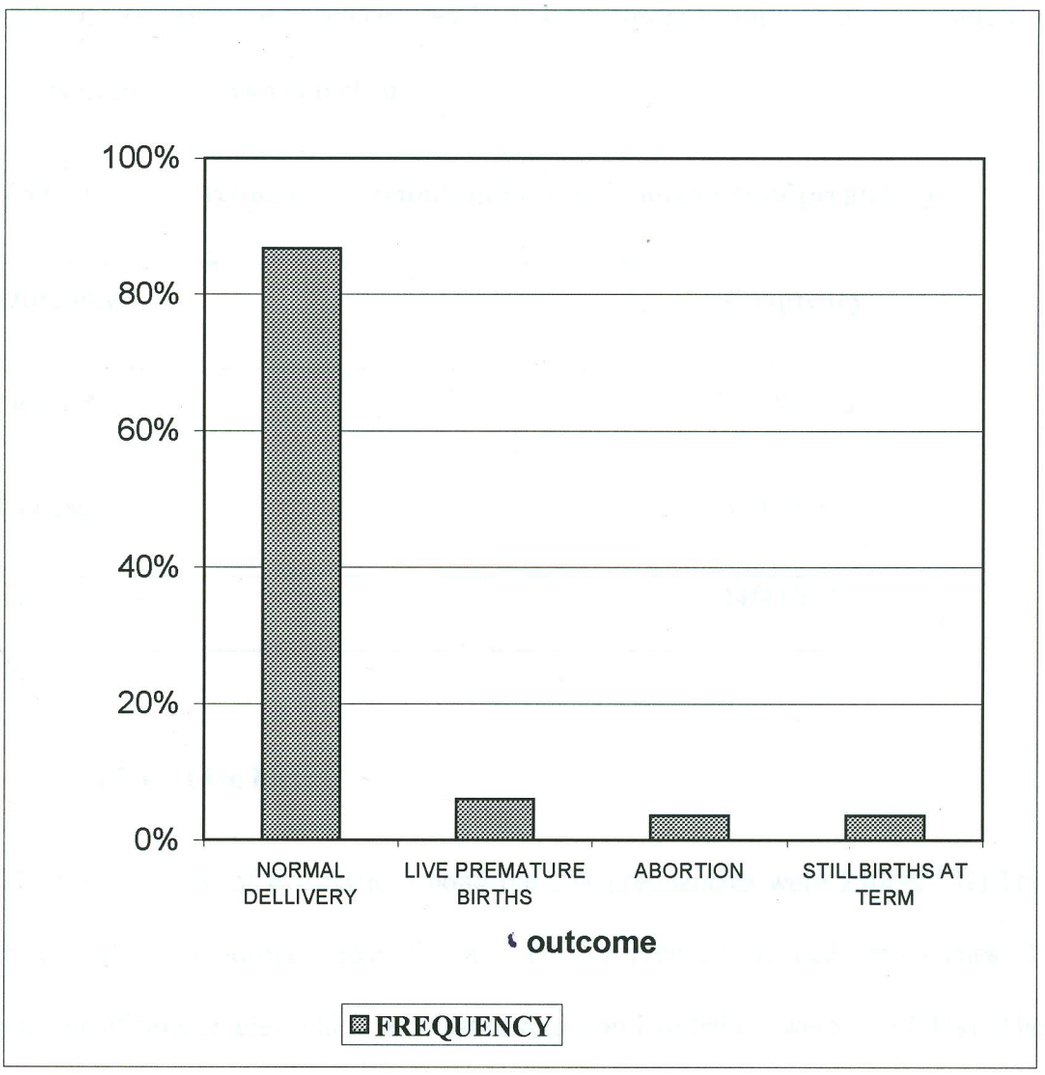


FIGURE 1: Frequency distribution of pregnancy outcomes

To determine factors that can influence pregnancy outcome, the four foetal outcomes of pregnancies were put into two broad categories of desired and undesired pregnancy outcome. Normal deliveries with no immediate complications formed the desired pregnancy outcome, while live premature births, abortions, and stillbirths at

term constituted the undesirable pregnancy outcome. Thus 215 (86.7%) pregnancies and 33 (13.3%) pregnancies resulted into desired and undesired outcomes, respectively, as shown in table 6.

TABLE 6: Frequency distribution for foetal outcomes of pregnancy

Outcome	Frequency
Desired	215(86.7%)
Undesired	33 (13.3%)
Total	**248(100%)**

4.2.1 Live births

The total number of live births among the 248 pregnancies were 230(92.7%).These include the 215 normal deliveries and 15 live prematurely delivered babies. The number of pregnancies which terminated into non live babies were 18 (7.3%). These included 9 abortions and 9 stillbirths.

4.2.2 Pregnancies terminating before term

Out of the 248 pregnancies, 24 (9.7%) terminated before term. These include the 15 premature deliveries and 9 abortions.

4.2.3 Perinatal mortality

Out of 230 babies who were borne alive, 10 (4.3%) died within the 1st month of life.

The stillbirth deliveries were 9. Out of these stillbirths, 6(66.7%) were fresh stillbirths and 3(33.3%) were macerated stillbirths. The perinatal deaths were 19, including the 9 stillbirths at term and 10 neonatal deaths. From this results, the perinatal mortality rate for this study has been calculated and found to be 83 per 1000 live births.

4.3 Maternal pregnancy outcomes.

Out of 248 pregnancies studied 8 (3.2%) developed features of infection following delivery/abortion.

A total of 34 mothers complained of symptoms that they thought are related to their last pregnancy. Out of these complains 32 (94.1%) were recurrent abdominal pain and the remaining 2(5.9%) were lower limb deformity (foot drop).

There were 4 maternal deaths encountered during the study. Using the live births as denominator, the maternal mortality ratio can be calculated to be 1746/100,000 live births. However due to the small sample size in this study, statistically the maternal mortality ratio observed here can't be generalized to the district. Therefore this study did not intend to determine the maternal mortality ratio. However the researcher has saw it important to mention about maternal deaths he encountered as the worst category of undesired pregnancy outcomes.

4.4 Relationship between pregnancy outcome and various factors

Various factors were investigated for their possible relationship with foetal and maternal pregnancy outcomes. The following section describes the observations from this study.

4.4.1 Maternal age

The respondents were grouped according to their age into three groups. The first group comprised of women aged below 20 years. This group was regarded as the group of teenagers. This group was considered to be a group of too young for the duties and responsibility of motherhood and physically immature to carry a pregnancy and pass through the process of delivery.

The second group comprised women aged 20-34 years. These are adults who are regarded to be at the proper age: i.e. mature enough for the reproductive duties and responsibilities and not too old for those responsibilities. It is a group that is considered to be of low risk for the mother as well as for the fetus as far as age is concerned. The third group is that of women aged 35 years and above. These are mothers at the other extreme age as far as reproduction is concerned. The group is considered to be of an increased risk for the mother and the baby due to physiological changes associated with aging. Advanced age has been associated with increased risk of pre-term deliveries, increased congenital malformations, and many of them are likely to have had several children in the past, hence suffer other risks associated with grand multi-parity.



Majority of the respondents fall under age group 20-34 years, 11.7% of the mothers belong to the teenage group and 17.3% belong to the group aged 35 years and above.

The age group distribution of the women studied is illustrated in figure 2 below:

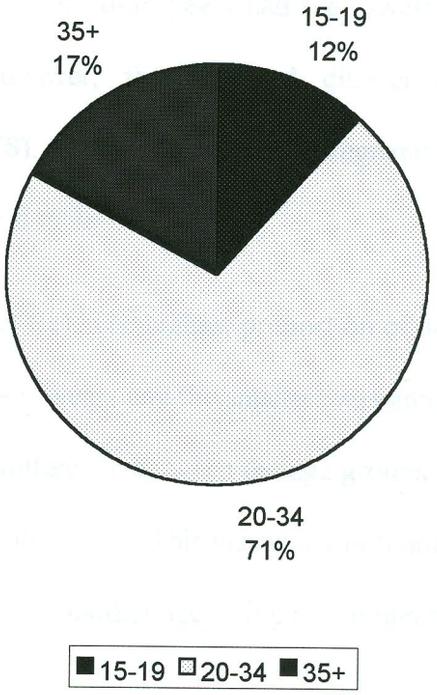


FIGURE 2: Age group distribution of women involved in the study

Relationship between age of the mothers and pregnancy outcomes: -

The largest proportion of mothers studied belongs to the age group 20-34years (71.0% of all the mothers). Only 11.7 of the mothers belong to the teenage group and 17.3% belong to the group aged 35 years and above.

Among the age group 15-19 years, 17.2% of the pregnancies resulted into undesired pregnancy outcomes; while in the age group 20-34 years, the undesired outcomes were 12.5% and in the age group 35 and above the undesired outcomes were 14.0. Also the results, the age group 20-34 years had the lowest proportion of undesired pregnancy outcomes. However, the observed differences are not statistically significant. (P value = 0.78). The distribution of pregnancy outcomes with age are summarized in table 7(a) and table 7(b) below.

From results shown in table 7(a), The highest proportion of normal deliveries was found in the age group 20 –34 years and the smallest was among the age group 15-19 (teenagers). However the difference between the age groups was found to be not significant statistically. (P value >0.05)This means the outcome of pregnancies were not influenced by the age of the mother according to the findings of this study.

Also according to table 7(b), The highest proportion of undesired pregnancy outcomes is found among the age group 15-19 and the minimum is found in the age group 20-34. There is no statistically significant difference in foetal outcomes among the age groups (P- value >0.05)

TABLE 7(a): "Refined" Pregnancy outcome by maternal age.

Age group	Normal delivery	Preterm delivery	Abortion	Stillbirth	Total
15-19	24(82.8%)	2(6.9%)	1(3.4%)	2(6.9%)	29(11.7%)
20-34	154(87.5%)	10(5.7%)	6(3.4%)	6(3.4%)	176(71.0%)
35+	37(86.0%)	3(7.0%)	2(4.7%)	1(2.3%)	43(17.3%)
Total	**214(86.7%)**	**15(6.0%)**	**9(3.6%)**	**9(3.6%)**	**248(100%)**

Chi square =1.41 P - value =0.97

TABLE 7(b): Pregnancy outcome by maternal age

	OUTCOME		
AGE GROUP	**Desired**	**Undesired**	**Total**
15-19	24(82.8%)	5(17.2%)	29(11.7%)
20-34	154(87.5%)	22(12.5%)	176(71.0%)
35+	37(86.0%)	6(14.0%)	43(17.3%)
Total	**215(86.7%)**	**33(13.3%)**	**248(100%)**

Chi square =0.50 P value = 0.78

Relationship between chronic delivery –related problems with age

Women were asked about problems which they thought had their origin as consequences of the delivery or pregnancy they had in 2000. Among the women surveyed, 13.8% 13.1% and 13.0% of them reported having at least one such problem from among the age groups 15-19, 20-34 and 35 years and above respectively.

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The findings show no statistically significant difference on chronic birth –related health problems among these age groups (age groups 15-19; 20-34; and 35 years and above) (P =0.97). Table 8. illustrates the distribution of chronic problems with age.

Table 8: Symptoms of chronic problems arising from pregnancy by maternal age

Age group	With symptoms	Without symptoms	Total
15-19	4(13.8%)	25(86.2%)	29(11.7%)
20-34	23(13.1%)	153(86.9%)	176(71.0%)
35+	6(14.0%)	36(86.0%)	43(17.3%)
Total	**33(13.3%)**	**215(86.7%)**	**248(100%)**

Chi square =0.03 P – value = 0.99

Relationship between age and infection/sepsis

The relationship between history suggesting puerperal infections was analyzed and there was no significant difference across the age groups (P value >0.05). (See table 9 bellow)

Table 9: History suggestive of infection/sepsis with age

	HISTORY OF SEPSIS		
AGE GROUP	**Present**	**Absent**	**Total**
15-19	1(3.4%)	28(96.6%)	29(11.7%)
20-34	5(2.8%)	171(97.2%)	176(71.0%)
35^{+}	2(4.7%)	41(95.3%)	43(17.3%)
Total	**8(3.2%)**	**240(96.8%)**	**248(100%)**

Chi square =0.37. P. value = 0.83

Relationship between age and perinatal mortality.

The relationship between perinatal mortality and maternal age was explored and found to be statistically not significant as shown in table 10 below.

TABLE 10: Perinatal deaths by maternal age

Age group(years)	Perinatal mortality
15-19	5/29(17.2%)
20-34	11/176(6.3%)
35+	3/43(7.0%)
Total	**19/248(7.7%)**

Chi – square = 4.29; P= 0.12

4.4.2 Parity:

The parity of women during the pregnancy they had in 2000 were recorded. Parity groups were formulated and every responded was assigned to an appropriate group. The groups were as follows: -

Group one was the primigravida. This was formulated by considering special characteristics and risks this group has as far as foetal and maternal pregnancy outcome is concerned.

The second group was that for women para 2 to para 7. This is considered as a low risk group as far as MCH guidelines are concerned. They differ from the primigravidae in the sense that their biologically, psychologically and physically are well compared to primigravida, who have not gone through that process before.

The 3rd group was the group of para 8 and above women. These are considered as grand-multipara women, physiologically known to be associated by maternal risks like rupture of uterus, malpresentations and biologically associated with genetically malformations.

Relationship between parity and pregnancy outcomes

Among the mothers interviewed, 47 (19%) were primigravidae, 174 (70.2%) were para 2-7, and 27 (10.9%) of them were Para 8 and above.

The undesired outcomes of pregnancy among primigravidae were 17% while this was 11.5% among those women who were para 2 to 7 and 18.5% for para 8 and above. However the difference in prevalence of undesired pregnancy outcomes among the parity groups i.e. primigravidae, para 2-7 and grandmultipara women (para 8 and above) was found to be statistically not significant. (P value = 0.43) Table 11 summarizes the distribution of pregnancy outcomes with parity.

According to these results undesired pregnancy outcome does not depend on parity of the mother.

TABLE 11: Foetal pregnancy outcomes by parity

	OUTCOME		
PARITY	**Desired**	**Undesired**	**Total**
prim	39(83.0%)	8(17.0%)	47(18.9%)
2-7	154(88.5%)	20(11.5%)	174(70.2%)
8+	22(81.5%)	5(18.5%)	27(10.9%)
Total	**215(86.7%)**	**33(13.3%)**	**248(100%)**

Chi square = 1.69 P – value = 0.43

Association between parity and other outcomes like chronic delivery complications and occurrence of puerperal and post abortal sepsis were also investigated and all found to be statistically not significant as the tables 12 and 13 bellow illustrate:

TABLE 12: Symptoms of chronic problems arising from pregnancy by maternal age

	CHRONIC SYMPTOMS		
PARITY	**With symptoms**	**Without symptoms**	**Total**
1	7(14.9%)	40(85.1%)	47(19.0%)
2-7	21(12.1%)	153(87.9%)	174(70.2%)
8^{+}	6(22.2%)	21(77.8%)	27(10.9%)
Total	**34(13.7%)**	**214(86.3%)**	**248**

Chi – square =2.11 P value = 0.3

TABLE 13: Post delivery/abortal infection by parity

	SEPSIS		
PARITY	**Yes**	**No**	**Total**
1	1(2.1%)	46(97.9%)	47(19.0%)
2 – 7	5(2.9%)	169(97.1%)	174(70.2%)
8^{+}	2(7.4%)	25(92.6%)	27(10.9%)
Total	**8(3.2%)**	**240(96.8%)**	**248**

Chi square = 1.76 P. value = 0.4

4.4.3 Pattern of previous pregnancies

Relationship between patterns of previous pregnancies with pregnancy outcomes

The pregnant women were grouped according to their patterns of their previous pregnancies as "well spaced pregnancies" and "not well spaced pregnancies".

A woman was considered to have well spaced pregnancies if the minimum interval between delivery to the next conception is 16 months. This means if the she has two consecutive live term deliveries the interval between the children is 2 years and above. This has to apply to all the pregnancies the woman had in her life.

Among the 207 women whose pregnancy pattern was reported, 122 were reported to have well spaced pregnancies. This is 58.9% of the reported mothers. 85 mothers were found to have poorly spaced pregnancies. The pregnancy outcomes of these two groups were compared. The group with well-spaced pregnancies had 8.3% of pregnancy outcomes being undesired compared to 16.5% in the group with poorly spaced pregnancies.

With these results, the proportion of pregnancies which ended as undesired foetal outcomes in the group of women with poorly spaced pregnancies are almost twice of those from the group with well spaced pregnancies. However the difference was shown to be statistically not significant. (P value >0.05)

(See table 14 bellow)

TABLE 14: Foetal outcome of pregnancy by pattern of previous pregnancy

PATTERN OF PREGNANCY	PREGNANCY OUTCOME		
	Desired	**Undesired**	**Total**
Well spaced	112(91.8%)	10(8.2%)	122(58.9%)
Poorly spaced	71(83.5%)	14(16.5%)	85(41.1%)
Total	183(88.4%)	24(11.6%)	207(100%)

Chi square = 3.35 P- value = 0.06



4.4.4 ANC attendance

The respondents were asked whether they attended ANC during their pregnancy. They were classified into 2 groups. Those who never attended ANC were labeled never attended and those who attended at least once were termed so. Out of the 248 mothers interviewed, 241 (97.2%) of them attended at least once to ANC during their pregnancy. Only 7 mothers (2.8%) did not attend. Among the group which attended at least once to ANC, 11.3% resulted into undesired pregnancy outcomes, while in the group of those who didn't attend ANC, the extent of undesired pregnancy outcome was 71.4%. These results indicate that there is statistically evidence that antenatal attending women have low proportion of undesired pregnancy outcomes. (P. value < 0.001). Table 15 bellow illustrates these results.

Table 15: Foetal pregnancy outcome by ANC attendance

	OUTCOMES		
ANC ATTENDANCE	**Desired**	**Undesired**	**Total**
attended	213(88.7%)	28(11.3%)	241(97.2%)
never	2(28.6%)	5(71.4%)	7(2.8%)
Total	**215(86.7%)**	**33(13.3%)**	**248(100%)**

Fisher exact: 2 tailed P value=0.0005

Post delivery /post abortal infections with ANC attendance

Symptoms of infection after delivery or abortion were experienced by 2.9% of those mothers who attended ANC clinics at least once while the rate was 14.3% among those who never attended ANC clinics. The observed difference was found to be statistically not significant. (Fisher exact 2-taied P-value =0.207). This implies that there was no statistically significant difference on symptoms related to pregnancies among those who attended and those who did not attend ANC.

Table 16 below illustrates the relationship between ANC and post abortal /post delivery infections.

TABLE 16: Post delivery/abortal infection by ANC attendance

	SYMPTOMS OF INFECTION		
ANC ATTENDANCE	**Infected**	**Not infected**	**Total**
Attended	7(2.9%)	234(97.1%)	241(97.2%)
Not attended	1(14.3%)	6(85.7%)	7(2.8%)
Total	**8(3.2%)**	**240(96.8%)**	**248(100%)**

Fisher exact: 2-tailed p-value =0.207

Note: Fisher exact test was used here due to small values in some of the table cells.

Place of delivery

4.4.5 Place of delivery with pregnancy outcome

On asking about place where the women were attended during delivery or abortion, it was found that, Only 112 (45.2%) out of the 248 delivered at health facilities. 124 (50%) delivered at their homes. Only 12 mothers (4.8%) reported to deliver to traditional birth attendants' homes. There was no statistically significant difference in pregnancy outcomes between different places of delivery. Putting other places together, the cases of undesired pregnancy outcomes was 10.8% at the health facilities compared with 15% for those delivered in other places (P =0.28). This figure is again not statistically significant. The details of the distribution of pregnancy outcomes with place of delivery are summarized in table 17(a) below.

TABLE 17(a): Foetal pregnancy outcomes by place of delivery

	PREGNANCY OUTCOME		
PLACE OF DELIVERY	**Desired**	**Undesired**	**Total**
Home	102(82.9%)	21(17.1%)	123(49.6%)
Health facility	100(89.3%)	12(10.7%)	112(45.2%)
Other places (including at TBAs)	13(100%)	0(0.0%)	13(5.2%)
Total	**215(86.7%)**	**33(13.3%)**	**248(100%)**

Chi square = 4.16. P. value = 0.12

The foetal outcome of pregnancy are regrouped by combining the other placed other than the health facility and compared to those delivered at health facilities and results summarized in table 17(b).

According to the results shown on table 17(b), mothers who delivered at health facilities have lower proportion of pregnancies terminating as undesired foetal pregnancy outcomes than those who delivered at other places. However the difference is not statistically significant. That implies that there is no enough evidence of relationship between the place of delivery and foetal pregnancy outcome according to this study.

TABLE 17(b): Foetal pregnancy outcome by place of delivery

	PREGNANCY OUTCOME		
PLACE OF DELIVERY	**Desired**	**Undesired**	**Total**
Health facility	100(89.3 %)	12(10.7%)	112(45.2%)
Other places	115(84.6 %)	21(15.4%)	136(54.8%)
Total	**215(86.7 %)**	**33(13.3%)**	**248(100%)**

Chi square =1.19 P- value =0.275.

Place of delivery with post delivery or post abortal infection

Symptoms of infection were 1.8% in those who delivered at health facilities and 4.4% in those who were attended in other places. The observed difference however is not statistically significant. (P – value >0.05).

TABLE 18: Infection by place of delivery

	INFECTION STATUS		
PLACE OF DELIVERY	**Infected**	**Not infected**	**Total**
Health facility	2(1.8%)	110(98.2%)	112(45.2%)
Others	6(4.4%)	130(95.6%)	136(54.8%)
Total	**8(3.2%)**	**240(96.8%)**	**248(100%)**

Chi-square =1.37 P-value = 0.244

Relationship between place of delivery and chronic delivery complications

Symptoms of chronic problems experienced were 11.6% in those who delivered at health facilities and 15.4% for those who delivered at other places. The difference is not statistically significant. (P –value >0.05)

TABLE 19: History of chronic delivery –related problems by place of delivery

	CHRONIC SYMPTOMS STATUS		
PLACE OF DELIVERY	**Present**	**Absent**	**Total**
Health facility	13(11.6%)	99(88.4%)	112(45.2%)
Others	21(15.4%)	115(84.6%)	136(54.8%)
Total	**34(13.7%)**	**214(86.3%)**	**248(100%)**

Chi –square = 0.76 P- value = 0.382

Perinatal mortality and place of delivery:

Relationship between perinatal mortality and place of delivery were also investigated and found to be statistically not significant as illustrated in table 20 bellow:

Perinatal mortality by place of delivery

TABLE 20: Perinatal mortality by Place of delivery

	PERINATAL MORTALITY		
PLACE OF DELIVERY	**Yes**	**No**	**Total**
Health facility	5(4.5%)	107(95.5%)	112(45.2%)
Other places	14(10.3%)	122(89.7%)	136(54.8%)
Total	**19(7.7%)**	**229(92.3%)**	**248**

Chi square = 2.95 P –value =0.09

4.4.6 Personnel assisting delivery/termination of pregnancy

Type of personnel who assisted the delivery/ termination of pregnancy with pregnancy outcome.

The desired outcomes were 89.6% for health personnel, 75% for trained TBAs 77% for the non trained TBAs and 91.5 for those assisted by relatives and 94.4% for those delivered without assistance. This looks to be paradoxical to the expectation. However the difference in outcome among the types of personnel are statistically not significant. On grouping the outcomes into desired and undesired , with personnel being grouped as those from health facilities and others; The percentages of desired pregnancy outcomes for health facility staff and non health facility personnel becomes 89.6% and 84.1% respectively. This again is not statistically significant difference.

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pregnancy outcomes for health facility staff and non health facility personnel becomes 89.6% and 84.1% respectively. This again is not statistically significant difference.

The rate of infection symptoms were recorded in 1.7% among those who were attended by health facility staff and 4.5 for those being attended by other personnel. (P value >0.05)

Symptoms of chronic complications were 12.2 among those attended by health staff and 14.3 % for those attended by other types of personnel. (P – value > 0.05)

Tables 21 to 24 illustrate the relationships of types of personnel who assisted deliveries with different types of pregnancy outcomes. All of these tables show no statistical difference between different pregnancy outcomes and the type of personnel

TABLE 21: Foetal pregnancy outcome by personnel assisting delivery

	FETAL PREGNANCY OUTCOME		
PERSONNEL	**Udesired**	**Desired**	**total**
Health facility staff	104(89.7%)	12(10.3%)	116(46.8%)
Non health facility staff	111(84.1%)	21(15.9%)	132(53.2%)
Total	**215(86.7%)**	**33(13.3%)**	**248**
Chi –square = 1.66	P – value = 0.2		

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TABLE 22: History of chronic delivery –related problems by personnel assisting delivery

	CHRONIC SYMPTOMS		
PERSONNEL	**Yes**	**No**	**Total**
Health facility staff	14(12.1%)	102(87.9%)	116(46.8%)
Non health facility staff	20(15.2%)	112(84.8%)	132(53.2%)
Total	**34(13.7%)**	**214(86.3%)**	**248**

Chi –square = 0.5 P – value = 0.48

TABLE 23: Infection by personnel assisting delivery

	SEPSIS		
PERSONNEL	**Yes**	**No**	**Total**
Health facility staff	2(1.7%)	114(98.3%)	116(46.8%)
Non health facility staff	6(4.5%)	126(95.5%)	132(53.2%)
Total	**8(3.2%)**	**240(96.8%)**	**240**

Fisher exact: 2-tailed: P – value = 0.29

TABLE 24: Perinatal mortality by place of delivery

	PERINATAL DEATH		
PERSONNEL	**Yes**	**No**	**Total**
Health facility staff	5(4.3%)	111(95.7%)	116(46.8%)
Non health facility staff	14(10.6%)	118(89.4%)	132(53.2%)
Total	**19(7.7%)**	**229(92.3%)**	**248**

Chi –square = 3.46 P – value = 0.06

4.4.7 Distance from home to nearest health facility

relationship between pregnancy outcomes and distance from home to health facility;

Respondents were again classified according to distance from home to the nearest health facility. done using the walking distance as means of measurement. This process resulted into three groups of short, medium and long distance. Those who lived within one walking hour from the nearest health facility were classified as living within short distance from the nearest health facility. Those who lived within one to two walking distance were termed as living within medium distance, and those living in more than two hours walking distance were termed as living at long distance from the nearest health facility.

those living in more than two hours walking distance were termed as living at long distance from the nearest health facility.

The proportion of pregnancies with undesired outcomes was highest among those who stay at long distance (more than 2 walking hours), followed by those who stay at medium distance and those who stay at short distance had the smallest proportion of undesired foetal pregnancy outcomes. However the difference is statistically not significant. (P-value >0.05)

Below is the table showing the relationship between foetal pregnancy outcomes with distance from the nearest health facility.

TABLE 25: Foetal pregnancy outcome by distance from nearest health facility.

	OUTCOME		
DISTANCE	**Desired**	**Undesired**	**Total**
Short	104(88.9%)	13(11.1%)	117(47.2%)
Average	81(87.1%)	12(12.9%)	93(37.5%)
Long	30(78.9%)	8(21.1%)	38(15.3%)
Total	**215(86.7%)**	**33(13.3%)**	**248**

Chi –square = 2.48 P- value = 0.29

5 DISCUSSION

Despite of the emphasis of women and child health care in reproductive health, maternal and foetal outcomes remain to be of much concern to our country and other third world countries. Many women are dying due to preventable pregnancy related complications and during or immediate after labour. Graham W. reported in 1998 that about 600,000women are dying every year due to maternal related complications. Virtually all of these deaths are in developing countries and it is estimated that 88-98% of these deaths are preventable and result from causes which women in developed countries have rarely endured for over a century. (Graham W. 1998) In addition to these deaths, many other women survive with long-standing morbidity as a consequence of being pregnancy or delivery. Similarly many children die either during delivery or shortly after delivery. Many of the causes of these deaths are preventable. That means given availability of resources and technology, it is possible to reduce markedly the maternal morbidity and mortality, neonatal mortality, stillbirths and other undesired outcomes through provision of quality and acceptable reproductive health care for all the people with specific emphasis to maternal and child care.

The main objective of this study was to try to explore the magnitude of undesired pregnancy outcomes and try to study different factors that could be associated with such outcomes for the aim of utilizing such information for improvement of health of mothers, children and the community at large. The study was undertaken in a remote urban district of Kwimba where it was assumed that the place is likely to have poor health status than the average in the country.

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5.1 Maternal and foetal pregnancy outcomes

Some of the undesired maternal and foetal pregnancy outcomes, specifically the maternal and perinatal mortality findings in this study are very high.(MMR is 1746 per 100,000 live births and Perinatal mortality rate of 83 per 1000 live births) This can imply poor health care for pregnant women and delivery care. This is consistent with the general notion that where there are poverty, ignorance and poor health care services, then pregnancy outcomes especially maternal as well as foetal/perinatal morbidity and mortality are high. In other words, improvement of socio economic situation in developed countries has reduced maternal and perinatal mortality in those countries.

Although some of the findings in this study e.g. maternal mortality are high than those obtained from other studies in the country, other studies had reported similarly high rates from developing countries. (Pohjonen, P. 1998). WHO has estimated that maternal death rates in Africa are over 870 per 100,000 in general , with over 1,000 per 100,000 live births in Eastern and Western Africa.

Although the sample size used in this study is small to give representative of the whole community of Kwimba, it cannot be ignored completely. The maternal mortality ratios do differ significantly from one place to another. There are other studies, that were performed by other researchers which have come with findings well above those found by this study. Greenwood *et al*, in 1987 found maternal mortality ratio of 2716 per 100000 live births in one district (Farafanni district) in

Gambia. (Greenwood *A. et al.*,1987, Greenwood *A. et al.*,1990, Greenwood *A. et al.*,1991.)

Hospital based data from Ndanda Hospital reported MMR of 1288 in 1993. (Ndanda hospital annual reports 1993, 1995, and 1996).

There are many theories and reports concerning factors that determine pregnancy outcomes. Some of the widely studied factors include socio-economical, cultural, and biological factors, including poverty; illiteracy especially for the mothers; health services provision, accessibility and acceptance; maternal age; parity; pattern of pregnancies etc. This study tried to look on some of these factors to see how they contribute to the undesired pregnancy outcomes. Unfortunately in spite of the study showing big problem on undesired pregnancy outcomes especially the fatal outcomes, it did not establish clear/significant association with majority of the factors.

This can be due to the multiple factors that play part together in the same community so that absence of a certain factor doesn't excuse that person having another factor that similarly contribute to the outcome under question.

However different studies carried from other parts had reported similar controversies. (Semiono 1978)

Pregnancy outcomes

In normal circumstances, a pregnant woman is expected to continue with the pregnancy and deliver at term. Exceptions should have been the unavoidable abortions due to malformed foetuses that are incompatible with life. Otherwise most of the undesired pregnancy outcomes can be prevented.

However often this doesn't happen. Many pregnancies end up into various undesired outcomes (more in developing countries) that could have been avoided. The extent differ from one place to another, and from one community to another.

Different undesired pregnancy outcomes and factors associated with are explained below.

Foetal outcomes

For the sake for this study, foetal outcomes of pregnancy have been grouped mainly into two main groups. The delivery of a normal healthy baby at term without immediate complications is considered as normal delivery. This type of outcome is the so-called desired outcome in this study. All the other outcomes that had some negativity in terms of well being of the foetus or neonate have been grouped together forming the group of abnormal/undesired foetal pregnancy outcomes. There is no other study encountered by the investigator of this study that had looked the problems of pregnancy in that way, hence, no other studies had been compared with this. However, several categories that constitute the negative (undesired) outcomes of pregnancy have been studied separately and the factors identified in such studies will be compared to the findings from this study.

A number of factors have been observed to be associated with these undesired foetal outcomes of pregnancy in this study. However the relationships are weak and hence are statistically not significant. However ANC attendance has shown to have statistically significant association with foetal pregnancy outcomes. Incidence of undesired foetal pregnancy outcomes was statistically higher on those who never attended ANC than those who attended at least once to ANC.

These observations can be explained from different perspectives. One perspective could be due to the fact that majority of women attend to ANC during the late second or early third trimester. As abortions are more during the first and second trimester, there is a high chance of abortions taking place before the mother starts to attend to ANC. Another possibility could be due to true effect of antenatal care in improving maternal and preparing mothers to have healthy babies.

The other possibility could be that those mothers who had accepted ANC services are those from modern families, they don't rely on traditional services like using local drugs which can have detrimental effect to the foetus. This study didn't give an answer as to which is the likely explanation.

Pre-term delivery.

Preterm delivery is defined as delivery before 37 completed weeks of gestation. However in this study it was difficult to quantify the actual gestation age at which the babies were borne. Therefore, the researcher relied on explanation of mother, and

history from ANC cards to categorize gestation age during delivery simply as term and preterm.

The preterm babies are being associated by multiple ill health factors. The risk of perinatal death is high in perterm borne babies than in term babies due to hypothermia, and/or respiratory distress

The proportion of pregnancies that ended up into preterm delivery in this study is comparable to findings of studies from other places. Wide studies had shown that the prevalence of preterm deliveries range from 5% in low risk group to 20% in high risk group. (Gillian Woolner 1998)

Cathy Burk observed that the overall preterm delivery among Irish women was 5.5%, which is very close to the findings of this study. It is not exactly proper to compare this study results with that undertaken by Cathy because they potentially differ in methodology used. No factors were implicated with the observed cases of preterm deliveries.

However the well-known factors like Hypertension and other diseases were not studied in this study due to difficulties in diagnosing them in the community where routine medical check-up is not a common practice.

Perinatal mortality

The perinatal mortality of 83/1000 for Kwimba observed in this study is higher than the findings by Ndyetabula in Nzega district in 1990, where he found perinatal mortality of 72.5 /1000 live births.

A Hospital based study conducted at Sumve Designated Hospital in this district of Kwimba revealed perinatal mortality of 96 per 1000 live births for the years 1989 and 1990. (Walraven G.E et al., 1997) Therefore this was higher than that obtained by this study.

The perinatal mortality for Tanzania, according to different studies is shown to be within 40 to 100 per 1000 live births. The ratio of stillbirths to neonatal deaths is 9:10, which is approximately 1. Other studies in the country and other developing countries indicate excess of stillbirths to early neonatal deaths. This study had combined the early and late neonatal deaths for convenience. It is expected then that by omitting the late neonatal deaths the ratio of stillbirth to neonatal deaths might be greater than 1, which is consistent to studies done in other places. This community based study observed high incidence of perinatal mortality than those reported by other studies. The neonatal mortality obtained in this study are comparable to that obtained in the Tanzania Demographic and Health Survey 1996. According to this survey, the neonatal mortality rate for Tanzania ranges from 31.7 to 46.8 per 1000 live births within different periods. The neonatal mortality rate for this study is calculated and found to be 43 per 1000 live births

Maternal outcomes

Long-lasting birth related injuries

Excluding maternal deaths which will be explained separately, the prevalence of maternal chronic birth-related problems is 13.3% of all the pregnancies surveyed. The most frequent complain was chronic abdominal pain, possibly due to chronic

pelvic inflammatory disease. Except for the two cases of foot drop other serious disabilities e.g. gynaecological fistulae were not encountered.

Rarity of severe chronic disabilities is contrary to finding and reports from Pohjonen, P. who had indicated that for every maternal death that occurs, more other women suffer from serious pregnancy consequences. It was expectation of the researcher that with four cases of maternal death, major other complications like gynaecological fistulae would have been more than four cases. etc. (Pohjonen, P. 1998).

The possible explanation for this observation is the causes of the deaths. All the causes of death encountered are severe post partum haemorrhage. Although it was not easy for this study to establish specific cause of death, it is unlikely that they died of infection. However whether the haemorrhage was due to uterine rupture is not easy to state precisely. This needs to be seriously considered and studied in detail as previous health reports from the district indicate that the most common cause of mortality is ruptured uterus. In such areas where majority of women are delivering at their homes or to traditional birth attendants, possibility of using traditional herbs with oxtocic effects can be underlying cause of such ruptured uterus

Also, in rural areas like Kwimba, where most deliveries are carried in homes under unclean condition, and the food security is poor, other problems of concern in delivery are infections, malnutrition and obstructed labour. Possibility of high incidence of puerperal infection is consistence with the prevalence of chronic abdominal pain observed in this study.

Puerperal and post abortal infection

Puerperal infection is one of the inexcusable cause of maternal deaths and countless other long term disabilities. (Graham W. 1998). Although puerperal sepsis was not a major problem in this study, history suggestive of chronic pelvic inflammatory disease (PID) can imply high incidences of infections. However it was not possible for the study to establish without doubt causal associations between abdominal pain and puerperal infection during the previous pregnancy.

Absence of significant difference in infection rate and chronic sufferings between mothers attended by health facility staff and those attended by other non medical personnel during delivery or termination of pregnancy gives another challenge to the health services provision in our rural areas. Macleod also found no difference in pregnancy outcomes between different places of delivery as well as between type of personnel attending the deliveries (MacLeod 1998)

Explanation for this lack of difference can be in two folds.

It can be true that non-trained staff like TBAs in their homes or to women's homes provide similar quality of health care during delivery. In this case we have to look on quality of care provided at our rural community. If this observation and explanations given are correct, then the logical way to put is that "our health facilities and/or our health staff provide as poor quality health services as the untrained traditional birth attendants or relatives" rather than "The trained birth attendants provide as good care during delivery as the health personnel at health facilities." If this last part of

attendants or relatives" rather than "The trained birth attendants provide as good care during delivery as the health personnel at health facilities." If this last part of the above statement were true, then we would expect good outcome than we had observed in this study.

Looking through another perspective, indifference in sepsis between the groups of health providers and location of delivery can mean that only those most at risk mothers are taken to health facilities, often at late stage after trial at home for a long time. Therefore, women reaching at health facilities are likely to be infected during prolonged trial, with several unhygienic actions at home. In this way, even if aseptic techniques are instituted at health facility, still there will be high possibility of infection, unless radical antibiotics treatment is instituted.

Maternal mortality:

If we attempt to calculate maternal mortality ratio from the data we collected in this study, we get maternal mortality ratio of 1746/100,000. This is extremely high if compared to other studies within the country. It is four times the official MMR reported by MOH. It is two times the observed by UNICEF in 1998. These high maternal deaths can be explained by poor health care in rural areas. It was expected that in such areas, the MMR is likely to be above the average country's official rates, which mainly obtained from health facilities that usually do not include those deaths taking place outside the facilities.

Probably the most likely explanation of these findings is lack of representation of the sample. According to the incidence of maternal deaths, the sample size studied is too

small to be generalized as adequate representation of all Kwimba district. This study was not intended to determine the maternal mortality ratio for the same reasons. Maternal deaths have been mentioned here due to their seriousness and sensitivity to the communities as well as to health providers.

However community based studies like this in other places in Africa had come with MMR higher than that obtained here. Greenwood in Gambia obtained a MMR of 2716 in Farafanni district Gambia.(Greenwood *et al.*, 1991)

Severe haemorrhage was mentioned as the cause of death in all the 4 deaths. As had been said before the scope of this study couldn't go into detail to establish the real cause of haemmorhage. However, history from relative was not suggestive of prolonged labour to suspect ruptured uterus. But we should not rely much on the history from relatives because often such history is furnished in order to avoid criticism in case they think they are to be blamed for not providing adequate assistance to the victim. There is a possibility of uterine rupture even without prolonged labour if strong oxytocic drugs/substances are used. This needs to be investigated.

Mac Leod J found a maternal mortality of 961 per 100000 live births in Bagamoyo district. The leading cause of death was post partum haemorhage with or without placenta retention. He found a significant high among women aged 40 years and above with 5 or more prior pregnancies. Maternal age under 19 years was not associated with an increased risk of mortality. Maternal deaths also were unrelated to access to a main road, access to a health facility, presence of antenatal risk factors, contact with health care personnel before death and the location (home or hospital) of

delivery. All these factors were also found to be statistically not significant in determining prevalence of post delivery infections and chronic delivery related disabilities in this study.

5.2 Factors associated with pregnancy outcomes

age

Generally young age and old age is one of the factors contributing to undesired foetal outcome. The undesired foetal outcomes are highest in the teenagers group (17.2%), followed by those aged 35 years and above (14.0%), while the age group 20 to 34 years carries the lowest proportion (12.5%) This is consistent with the current advocacy of insisting on avoiding teenage pregnancies and pregnancies at old ages. However the findings are statistically not significant. This lack of significance can be explained by the fact that teenage pregnancies are regarded as at risk pregnancies and hence are advised to deliver at health facilities. Therefore these can benefit from better management by qualified staff than those who are old, and tend to deliver domiciliary, hence reducing the direct effect of additional risk associated with lack of health care services.

We term the risk factor associated with pregnancy in teenagers as 'underage'. There are views that pregnancy and labor at young age may be accompanied by risk of biological, psychological and sociological in nature. This study did not establish significant difference in maternal and foetal outcome with age group 15-19. In other

studies, there are conflicting results on the outcome of pregnancy in the teenagers group. Whereas some workers report fewer complications than older patients, others reported poor outcomes. Duonhrelter noted no significant difference. (Duonhrelter *et al,* 1975)

The most accepted physical risks and complications are EPH gestosis, eclampsia, pelvic inlet contracture. History suggestive of EPH gestosis and eclampsia did not come up in this study. Pelvic inlet contracture could not be determined directly in this study.

Relatively high undesired foetal outcomes in old women can be due to the fact that many of them have already gave birth in the past. They tend to deliver at their homes, under assistance of either TBAs or relatives. With experience, they tend to neglect precautions by believing that if they successively delivered in the past, then they are unlikely to get problems.

Congenital malformations are associated by old age according to studies done in developed countries. Developing countries are no exceptional. Therefore a number of stillbirths and early neonatal deaths in this study could have been contributed by congenital malformations as well. The incidence of fatal congenital malformations among different groups of women in this setting cannot be easily obtained.

Relationship between age and chronic problems: -

This study investigated chronic health consequences of pregnancy with age. There is no significant difference across the age groups about chronic consequences. Of all the problems complained of, 94% of them was chronic /recurrent abdominal pain,

which could be due to chronic pelvic inflammatory disease due to other problems other than the last delivery.

High maternal mortality ratio without serious problems arising from injuries during delivery like fistulae is contrary to studies from other places which had shown that for every maternal death that occurs, more other women are left suffering from severe birth injuries like VVF, RVF and foot drop. With this high maternal mortality it was expected that those injuries could have been more than the deaths. (Pirjo P. 1998)

Possible explanation can be the causes of these deaths. For all the four deaths encountered the possible cause of death reported by the interviewee is severe hemorrhage following the delivery. Whether these are accidental haemorrhage, or uterine due to obstructed labour or use of herbs with oxytocic effects was not established by this study. There might be also associated by anemia in pregnancy that was not studied by this study. Absence of VVF AND RVF may indicate rarity of prolonged obstructed labour incidences. In rural area, with majority of women delivering at homes under poor hygienic conditions, assisted by non trained relatives and traditional birth attendants, the likely problems could be malnutrition, and infection. This is consistence with observation of high prevalent of chronic abdominal pain, probably arising from infection during poor management of labor or abortion.

Similarly, absence of difference in prevalence of chronic symptoms across the ages can be explained by the same common pregnancy problems.

Among others, problems of teenage pregnancies are due to immaturity, which predispose them to obstructed labor due to Cephalo Pelvic Disproportion. Under malnutrition the possibility of low birth weight is higher than the Cephalo pelvic disproportion. Therefore, the other problems i.e. infections, are more related to hygienic conditions during labor and age may have less influence on this, especially currently when many primigravida, who are the majority of teenagers are advised to deliver at health facilities.

Parity

The 1st pregnancy is associated with multiple risks. Most of these problems are biological physical due to the fact that they are inexperienced. The birth canal has not been subjected to labour process before. The labour tends to be prolonged than proceeding pregnancies. Foetal dystress, and birth injuries due to prolonged obstructed labour are more common to primigravidae . Also eclampsia is relatively high in this group. Grand-multiparity had also seen to be a risk factor to both mother and fetus (Mbizvo MT.1993)

This study indicate no significant differences in maternal and foetal pregnancy outcomes among women with different parity levels.

Findings of this study are consistent with a research by MacLeod in Bagamoyo concerning association of maternal mortality with parity.



Place of delivery and type of delivering attendant

It is assumed that labour, being a streneous physiological process, requires good care or assistance. Health workers, specifically well-trained midwives are the recommended personnel to handle the process.

They are supposed to assist the mother during delivery, monitoring for danger signs and be able to provide timely referral to high level in case of problems that cannot be handled at the facility. This study however didn't establish any difference in outcome between mothers who delivered at health facilities and those delivered at home or to TBAs.

This is also consistent with Mac-Leod study. Explanations may be like those described before i.e. either our health facilities especially 1st line health units are not well staffed with quality staff or not equipped with standard equipment for better management of labour. This is worse in rural areas like Kwimba. The second explanation of health facilities attending mainly at risk pregnancies should also be considered.

Tackling the problem of place of delivery and type of delivering attendants is tricky. The studies have shown that even at places where health facilities are close, still people prefer to deliver at home or to traditional birth attendants. More over, currently more than 50% of the deliveries are taking place outside of the health facilities. If all these women decide to come for delivery to the health facilities, the

services are likely to decline even more because they are not prepared to accommodate such number of deliveries.

Undesired pregnancy outcomes can as well be minimized by providing training and supportive supervision to TBAs, making then partners and hence using them to effect timely referral of at risk mothers. Improved hygiene around the time of birth and care of the umbilical cord that can be performed by well-trained traditional birth attendants can result into reduction of both maternal and neonatal undesired outcomes. (Greenwood, *et at.* 1990a)

Antenatal care attendance

This is the factor in this study that was found to be highly associated with poor pregnancy outcomes. The mothers were classified into those who never attended to ANC and those who attended at least once. These findings have to be interpreted cautiously. These findings alone are not enough to prove effectiveness of antenatal care clinics in minimizing undesired outcomes. The recommended time for booking is before 20 weeks of pregnancy. The mean age for booking to ANC in this study was 5.037 months which is more than the 20 weeks. This is the time when majority of early abortions have taken place. Taking into consideration the few women who don't attend to ANC , it is likely that those few individuals aborted before their time for booking.

Distance

Distance from health facility is another factor considered important determinant of pregnancy outcome. Distance affects physical accessibility to health facility.

However as it has been mentioned earlier, there was no statistically significant association in outcome between those who attend to heath facility and those who remain home. Therefore factors like distance that only affects utilization of health services will not change much the magnitude of the problems.

5.3 Limitation of the study

- According to African culture, open, free discussion about past bad event, especially those related to deaths is not commonly done. This result into difficulties in obtaining perinatal deaths. Also, some interventions are being carried out in the country, including the study area which might have raised awareness of the community members about some of the factors under study. This could have lead to interviewee bias by responding according to what they think is right and not what really happened or done.

- Interviewer bias could have occur when health workers are used to collect data within their working area (district).

- Recall bias: As the study was about asking respondents about events which happened after about a year, the information to be obtained was subject to recall bias.

- Selection bias: This study was a cross sectional study. It might have omitted women who had pregnancies during the period under study but have migrated to other places. Also, some women usually go back to their parents for delivery. In such women factors like distance from home to health facilities

may differ from distance from where they delivered and the nearby health facility. However in this district majority of people live and are married to people from within the village. Hence such bias is likely to be minimal.

- Sample size: Some of the factors to be studied could not be tested for statistical significant due to small numbers in some of the cells

To minimize these biases, and limitations, the following strategies were employed: -

- The interviewers were trained on establishing rapport with the respondents, before starting conducting the interview. This was expected to release anxiety and make them ready to provide the needed information.

- The research Assistants were recruited from within the district, to minimize negative suspicions on from the respondents.

- A limit of one year was set to minimize the recall bias.

- Efforts were made to make sure that research assistants (Village health workers) did not come from the same village they are working, i.e. they conducted the interview in villages different from theirs. This was aimed to minimize interviewer bias.

6 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The undesired pregnancy outcome findings in this study are higher than official records in the country. Although the sample is too small to be generalized to all the rural districts, it is likely that similar picture could be existing in many other districts,

In several areas the study show similarity to findings by other researchers in the country and in other countries especially the developing countries.

Many of the associations tested in this study to study the effect of different factors to pregnancy outcomes didn't show significant difference. This does not mean that the factors that the factors are not risk factors, but they have to alert health planners for detailed studies about the topic.

There is a general overwhelming acceptance of antenatal care during pregnancy, and health system have to appreciate this important step towards improvement of women and child health, including minimizing these undesired events.

The current problem of ante natal care services acceptance is late booking. Women need to be sensitized more to book early so as to benefit from continuous service and early screening of at risk factors. The recommended time for booking is before 20 weeks of gestation.

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Despite this widely acceptance of antenatal care services, when it comes to the real process of delivery, acceptance of health facilities for delivery is low. More studies are required to understand the socio dynamics hindering such acceptance.

Absence of statistical significant difference in outcomes between the groups of women delivering at health facility and those delivering at home or to traditional birth attendants like that observed by this study should be a challenge to health providers. If we don't improve our health facilities in terms of having qualified manpower and standard equipment, we will get difficulties in our advocating health facility acceptance. We need to consider carefully on whether improvement of health facilities for delivery, or improvement of domiciliary deliver by trained traditional birth attendants will bring us to our goal of reducing undesired pregnancy outcomes.

6.2 Recommendations

- In order to improve health services in the rural areas, and elaborate superiority in terms of good care to traditional practices, problems of health facilities should be investigated and addressed to. Quality of services in terms of having qualified and dedicated staff, standard equipment and supplies and acceptable physical infrastructures, and provision of acceptable environment to the community concerned should be investigated and authorities have to address for these.

- In order to prevent maternal mortality, dangerous unpredictable events like post partum haemorrhage should be addressed to both health workers and the community.

- TBAs training should be repeated to refresh the knowledge they acquire. The training should involve hygienic methods of assisting mothers during delivery, identification of at risk pregnancies. They also need to be incorporated into referral system in order to encourage them to provide timely referral to at risk pregnancies

- Conducive environment and relationship need to be established between health facility staff and traditional birth attendants so as to recognize them as partners, with same aim of preventing undesired pregnancy outcomes. The DHMT should support them if possible by providing them with equipment required for conducting hygienic procedures.

- Health personnel in the districts should establish continuous surveillance system to monitor maternal and fetal/ neonatal morbidity and mortality in their community so as to get more representative data than those obtained from health facility alone. Reliable data will help the health teams to monitor and evaluate success in interventions aimed at improving child and maternal health in their areas.

- It is also recommended that further studies need to be done to study the causes of fatal intrapartum and post partum haemorrhage. Process performed by TBAs and relatives during conducting the delivery, any herbs/drugs used

(if any) should be investigated for their pharmacological activity and strengths.

- Resuscitation equipment should be available to remote health facilities, going hand in hand with community action towards improving transportation of mothers in danger condition to higher level facilities.

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