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Men's involvement during pregnancy and childbirth in Zambia

Master Thesis

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Abstract

Background: Although sexual and reproductive health is an issue that affects both men and women, in the past the focus has been on women, as people who get pregnant and nurture the young. Men have largely been neglected, especially in Zambia. However, the picture changed and focus shifted to men only after the International Conference on Population and Development (ICPD) held in Cairo in 1994. The outcome of the conference enlightened people that good sexual and reproductive health is the right of all people, men and women alike, and that together they share responsibility of making decisions about sexual and reproductive health matters. Since then it is widely believed that involving men is an essential component for making women's and men's world better, be it during pregnancy and childbirth, child caring and rearing.

Aim: This study endeavoured to examine and understand the involvement of men during pregnancy and childbirth and its influence on pregnancy complications as well as neonatal deaths.

Design and methods: The study is grounded on logical positivism paradigm and as such it assumes an empirical and actual dimension .It adopts the three delays model by Thaddeus and Maine (1994) which identifies individual decision making, access to affordable services, and the provision of skilled personnel as the main factors which can delay access to effective interventions to prevent pregnancy related complications and death. Furthermore, based on this model, the study tries to link men's involvement during pregnancy and childbirth with delays one, two and three. Delays one and two refer to delay in decision to seek care and delay in reaching care respectively while delay three refers to delay in receiving care. Additionally, it uses secondary data obtained from the 2007 Zambia DHS and applies logistic regression in particular binary and multinomial.

Results: A large percentage of men (82.5 percent) are not involved during pregnancy and childbirth in Zambia (Univariate analysis). Only a handful (17.5 percent) of men is involved during pregnancy and childbirth in Zambia. More men from rural areas as compared to urban are involved during pregnancy and childbirth in Zambia (OR=1.50, P=0.002). Religion (p= 0.046) and women's occupation (p=0.000) influence or determine men's involvement during pregnancy and childbirth in Zambia (Multivariate regression models). The majority of the men and their wives or partners delayed in deciding to seek care when experiencing an obstetric complication (Univariate analysis).Men's involvement during pregnancy and childbirth in Zambia does not play any role in pregnancy complications and neonatal deaths as shown in multivariate logistic models. Even after adjusting for type of place of residence, men's occupation, women's occupation, and wealth index (confounders), we still find no significant association between pregnancy complications and adjusted men's involvement (95% CI=0.719 – 1.845, p=0.557) during pregnancy and childbirth in Zambia. Similarly, we still find no significant association between neonatal deaths and adjusted men's involvement (95% CI=0.691 – 1.367, p=0.870 during pregnancy and childbirth in Zambia even after adjusting for type of place of residence, men's occupation and women's occupation (confounders).

Discussion and conclusion: These could be true and valid findings but they might also be attributed to lack of robust indicators, lack of detail as well as limited and untimely data on the part of DHS. Hence, it is very important to make DHS data very relevant and current by frequently updating the core questionnaires to match and capture the emerging issues on the international agenda, particularly men's involvement in maternal and child health. This will entail swiftly revising and adding more questions in the questionnaires. Consequently, this will enable population and sexual and reproductive health researchers to easily conduct both qualitative and quantitative research targeting male involvement in female health issues.

Key Words: Men's involvement , Pregnancy, Childbirth, Delays, Pregnancy complications, Neonatal deaths , Zambia

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Lifecourse reflection

"In my wakefulness I have completed the course of my life and often times have found my direction is drastically altered by the rules, actions and misdeeds of human kind.

I have freely given my love, my gifts, my honour and my friendship, only to have that part of who I am met with mistrust, disbelief, suspicious and envious contempt.

Yet still, God and my sometimes flickering faith in him and myself have remained constant enough to survive the onslaught of the world at large. I have walked the path of the believers and found its direction leads home, where there is love and respect, givers and receivers, just like me.

My wakefulness has become my dream and my dreams my reality. Now love is my alter, dishonour and humility my strength."

Peabo Bryson (Through The Fire) Spring 1994

Such has been my life ''.

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Chapter one

1.1 Background

Women have long been the almost exclusive focus of international sexual and reproductive health forums and programmes. Focus on men has been relatively limited and far between, as have efforts to include them as partners in services for women (UNFPA, 2003).However, the picture changed and focus shifted to men only after the International Conference on Population and Development (ICPD) held in Cairo in 1994.The outcome of the conference enlightened people that good sexual and reproductive health is the right of all people, men and women alike, and that together they share responsibility of making decisions about sexual and reproductive health matters. The concern that emerged from the ICPD conference was that neither women nor men are likely to enjoy good sexual and reproductive health until they are able to discuss such matters and make decisions together. It was then that sexual and reproductive health activists, population researchers and policy makers realized the important role that men can play as supportive partners in achieving good health for women and newborns.

Men deserve attention and encouragement for their own sake, for women's sake, and for the health of their families and communities (Althaus, 1998). Men are key players in influencing, both positively and negatively the sexual and reproductive health outcomes of their partners, wives, and children (Dudgeon and Inhorn, 2004).Thus, ensuring men's involvement in sexual and reproductive health can promote a better partnership between men and women in the household and community at large. Furthermore, it is viewed that male involvement can capitulate positive health benefits for women through added social support (Carter, 2002). This entails men becoming partners and beginning to take responsibility for their own sexual and reproductive health and that of their partners. From this new perspective, men are potential partners in and advocates for good sexual and reproductive health rather than bystanders, barriers, or adversaries (Stycos, 1996).

Pregnancy care is a key component of sexual and reproductive health, which consists of different stages of pregnancy outcomes: antenatal, delivery and postnatal care. Good care during pregnancy is important for the health of the mother and the development of the unborn baby. Pregnancy is a crucial time to promote healthy behaviours and parenting skills. Pregnancy health is physical, mental and social wellbeing of women immediately before and during pregnancy as well as after childbirth (WHO, 2000). Therefore, pregnancy care means the provision of essential care of pregnant women to ensure safe delivery including postnatal care and treatment of complications of mother and newborns. Complications during pregnancy and childbirth are leading causes of death and disability among women of reproductive age in developing countries. These complications, which can occur at any time during pregnancy and childbirth without signs, require prompt access to proper obstetric services. Most of the deaths and disabilities due to childbirth are avoidable because the medical interventions are well known and inexpensive. Urgent and effective care before, during and after childbirth can make the difference between life and death for women. Thus, pregnancy care can prevent unpleasant outcomes when it is sought in time. The well being of mother and newborn depends on the pregnancy care that a mother receives during her pregnancy.

Newborn health and survival are closely linked to the care mother receives before and during pregnancy, childbirth, and the postnatal period. Throughout the continuum of care, the period with the highest risk of death and disability for both mothers and newborns is labour, birth, and the first few hours after birth. Complications and lack of care at this crucial time has consequences for mothers and babies (Lawn and Kerber, 2006).The postnatal period defined here as the first six weeks after

birth is critical to the health and survival of a mother and her newborn. A large proportion of maternal and neonatal deaths occur during the first 24 hours after delivery. Thus, prompt postnatal care is important for both the mother and the child to treat complications arising from the delivery, as well as provide the mother with important information on how to care for herself and her child. Lack of care in this time period may result in death or disability as well as missed opportunities to promote healthy behaviours, affecting women, newborns and children. It is recommended that all women receive a check on their health within three days of delivery (ZDHS 2007; Lawn and Kerber, 2006).

Men's involvement during pregnancy and childbirth could be interpreted in terms of physical involvement during antenatal, childbirth and postnatal check up. Furthermore, it could also entail helping partners indirectly: for instance, men can help in domestic work, give advice on immunization and consumption of iron and folic acid tablets, advice on appropriate nutrition and rest during the time of pregnancy. In addition, they can support their partners to buy vitamins and special foods (ZDHS, 2007). Oropesa et al. (2000) in their study among Puerto Ricans in the US have shown that husband's psychological support is positively associated with good pregnancy output. Likewise, husbands not only support their partners by accompanying and providing financial resources during medical checkup when they seek care but also play important role in decision making in various stages of pregnancy health.

However, none of the studies conducted in Zambia and elsewhere have provided full evidence on the factors predicting men's involvement during pregnancy and childbirth in both urban and rural settings at the same time. Furthermore, none of the studies has tried to understand the role of men's involvement during pregnancy and childbirth on pregnancy complications, and neonatal mortality. Additionally, none of the studies has tried to look at the possible relationship between men's involvement during pregnancy and childbirth and the delays and conversely between the delays and pregnancy complications and neonatal mortality. It is therefore important to examine and understand the involvement of men during pregnancy and child birth in an African country setting like Zambia. Given that Zambia's maternal and neonatal mortality rates continue at an unacceptably high level. Approximately 4,000 women and girls die each year due to pregnancy related complications. Additionally, another 80,000 to 120,000 Zambian women and girls will suffer from disabilities caused by pregnancy complications during pregnancy and childbirth each year. Furthermore, Zambia's perinatal and neonatal mortality rates are 38 deaths per 1000 live births and 34 deaths per 1000 live births respectively (USAID, 2000; ZDHS , 2007). The sad thing is that most of these deaths can be prevented with cost effective health care services. Reducing maternal mortality and disability due to pregnancy related complications as well as neonatal mortality will depend on identifying and improving those services that are critical to the health of Zambian women and girls such as antenatal care and adequate postpartum care for mothers and babies. It is widely believed that men's presence at antenatal care meetings has positive effect on the health of women during pregnancy and delivery (Iluyasu et al., 2010). Good ANC links the woman and her family with the formal healthy system, increases the chance of using a skilled birth attendant at birth and contributes to good health through the life cycle. Since, the major objective of antenatal care is to achieve the optimal health outcome for the mother and the baby. Specifically, the following could be accomplished by a skilled health worker: 1) early detection of complications and prompt treatment (i.e., detection and treatment of sexually transmitted infections); 2) prevention of diseases through immunization and micronutrient supplementation; 3) birth preparedness and complication readiness; and 4) health promotion and disease prevention by providing health messages and counselling to pregnant women (ZDHS, 2007). With this it is important to assess the level of male involvement during pregnancy and childbirth in Zambia. Nevertheless, it is even more important to study and understand the determinants predicting men's involvement during pregnancy and childbirth in Zambia. Additionally, it suffices to look at the impact of men's involvement during pregnancy and childbirth on pregnancy complications as well as neonatal mortality.

1.2 Literature review

There are very few studies that have looked at men's involvement during pregnancy and childbirth of their partners and wives (Abdel – Tawab 1997; Hallgren et al. 1999; Carter 2002; Ekeus and Christensson 2003; Singh, Lahiri and Srivastava 2004). Most of these studies examined the positive health benefits of men's involvement for wives and children. A study by Bhalerao et al., (1984) found that involving husbands in antenatal care counseling significantly increases the frequency of antenatal care visits, significantly lowers perinatal and neonatal mortality, and pays dividends even among uneducated and low socio – economic groups. Further, in contrast to men who do not participate in antenatal care counseling, men participating in antenatal care counseling tend to know more about family planning, nutrition and health of their wives during pregnancy, and the ways and means of preventing complications during pregnancy, at delivery, or during an abortion.Varkey et al., (2004) add that an intervention during prenatal consultations to increase men's involvement in their partners' maternal care increased couple's discussion and use of contraception and improved knowledge about pregnancy and family planning. A study by Mullany, Becker and Hindin (2007) provided evidence that educating pregnant women and their male partners yields a greater positive impact on maternal health behaviours compared with education of women alone. Similarly, Sternberg and Hubley (2004) add that empowerment of women without the involvement of men in Sexual and reproductive health is at best a partial solution and at worst could create conflict and result in more problems by increasing men's feelings of alienation. To this end, Westoff and Bankole (1995) found that, although women consistently preferred to delay, limit or cease childbearing at some point, they failed to do so because of the objections of their husbands. Things changed if their partners were involved from the beginning. However, only one study done in rural India by Singh and Ram (2009) has provided evidence on the factors predicting men's involvement during pregnancy and child birth. In this study, Singh and Ram (2009) found that age of the respondent, number of living children, education, and standard of living, type of household, religion, mass media exposure, gender attitudes and social networks were the factors predicting men's involvement during pregnancy and childbirth.

Furthermore, Varkey et al., (2004) in their study on men's involvement in maternity care in India found that men with better education and high exposure to mass media are more likely to participate in maternity care. On the other hand, Sharma (2003) looked at the association between information, education and communication (IEC) and husband's participation in pregnancy care. He adds that IEC is one of the influential factors encouraging men to participate in partner's pregnancy care in India. In the same vein, Odimegwu et al.,(2005) conducted a study in Nigeria on the men's role in emergency obstetric care and found that age, education, religion and mass media exposure (especially television) and number of wives show a statistically significant association with husband's involvement in obstetric care. They concluded that the older and educated men are more likely to know the danger signs than the younger and uneducated ones. This is contrary to what Iluyasu et al., (2010) found in a study conducted in a northern Nigerian community on birth preparedness, complication readiness and father's participation in maternity care. They observed high participation among the educated and young husbands. They argued that younger men are more adventurous and likely to challenge cultural norms. Furthermore, they stated that education was known to positively influence health seeking behaviour.

Additionally, Carter and Speizer (2005) in their study of Salvadoran father's attendance at prenatal care, delivery, and postpartum care also found that education and place of residence were significant predictors. They stated that men with more than a primary school education were more likely than their less educated counterparts to participate in one or more of the birth-related activities.

Furthermore, they argued that educated fathers may be more likely to be of higher socio - economic status, to have more free time or more flexible work schedules, to ascribe to norms about fatherhood that facilitate involvement in family health, or to use health care providers who facilitate their attendance at prenatal care, delivery, and well-baby care. However, with regards to place of residence, they found that rural residence was associated with a lower likelihood of men's participating in prenatal care visits. They stated that men from rural areas were more likely to have participated in one or two of the health care activities as opposed to all three. They argued that possible reasons for this could include relatively weak health care infrastructure in rural areas, long distances between rural residences and health care facilities, and economic and labour practices in rural settings that may limit men's ability to participate in many health care activities with their partners (Carter and Speizer, 2005).

In the same study the results of their multivariate analysis showed that men's pregnancy intention and their relationship with the partner were both strongly associated with their participation in birth related health care activities. They found that men with an unwanted or mistimed pregnancies and those not married were much less likely to participate in these activites.They argued that reporting an unwanted pregnancy and having a casual relationship to the mother of the child may represent men's lower commitment to and interest in the mother and child. On the other hand, birth order, father's age at around the time of birth contrary to what Iluyasu et al. (2010) and Odimegwu et al., (2005) found and male authority attitudes were not significantly associated with prenatal care participation, well baby care participation and attendance at delivery.

Similarly, Oropesa et al., (2000) in the study of Puerto Ricans women in the US found that pregnancy wantedness, type of relationship, age of the mother, education and number of children were strong predictors of adequate prenatal care. They argued, in the case of type of relationship that social relationships characterized by mutual obligations and trust serve as resources that can assist the individual. They are the conduits along which support and information flow. As such, social relationships facilitate action. For example, marriage typically reflects more extensive and more stable obligations between partners than alternative types of intimate relationships. The obligations that form the basis of the marital bond are multifaceted and include monetary and non-monetary support. This could explain why married women are more likely than unmarried women to secure adequate prenatal care (Albrecht and Miller, 1996; Roberts and Allen-Meares, 1995; Zambrana et al., 1991). However, in the case of education and age they argued that prenatal care is also linked to human capital skills and expertise acquired through experience. Schools increase endowments of human capital by exposing students to health related programmes and courses. Education also facilitates prenatal care utilization by increasing the capacity to process information through mastery of both the spoken and written word. In addition, individuals accumulate experience outside of educational institutions and learn about proper behaviours during pregnancy as they grow older. This is why prenatal care utilization is associated with both education and age among the general population (Casper and Hogan, 1990; McDonald and Coburn, 1988) and Latinas (Albrecht and Miller, 1996; Zambrana et al., 1991).

Mullany et al., (2005) in a study on can women's autonomy impede male involvement in pregnancy health in Katmandu, Nepal found that after adjusting for socio – demographic characteristics that women's autonomy, employment status and education level had a strong association with male involvement outcomes and decision making patterns. In their multivariate analysis they found that higher women's autonomy, as measured by her sole final decision making power, was associated with significantly lower male involvement in pregnancy health. However, after adjusting for other covariates, each additional decision in which a woman had final say was associated with a significantly lower likelihood of her husband accompanying her to antenatal care (OR= 0.70, $p<0.001$).On the contrary, joint decision making between husband and wife was associated with

significantly higher levels of male involvement in pregnancy health. They found that for each additional decision made jointly with the husbands, women were more likely to discuss health with their husbands (OR =1.47, p< 0.001), to make birth preparations (OR=1.19, p<0.05), and to experience a high level of male involvement (OR=1.29, p<0.05). However, with regards to education it was found that less educated women were significantly less likely to discuss pregnancy health with their husbands, receive assistance in reducing workload, or prepare for birth with their husbands. Likewise, with regards to employment status, it was found that women who were employed and also had employed husbands were more likely to experience several male involvement behaviours. Like Oropesa et al., (2000), Mullany et al.,(2005) also found that younger nulliparous women were more likely to have their husbands accompany them to ANC and help them reduce their workload than women who were older and had children.

Additionally,Vikashi Kumar KC and Sirjana Adhikari (2009) in their study of husband's participation in pregnancy care in Nepal found that a majority of husbands (more than 40.0 percent) accompanied their partners at ANC and were involved in various components of birth preparedness. Multivariate analyses from the same study indicate that education and socioeconomic status (wealth index) were positively associated with husband's participation. For example, they found that men with above secondary education were 2.3 times more likely to be involved in birth preparedness than their uneducated counterparts. Similarly, women's autonomy was negatively associated, while joint decision was positively associated with husband's involvement in pregnancy care.

Olayemi et al., (2009) in their study of male participation in pregnancy and delivery in Nigeria found that nearly all husbands (97.4%) encouraged their wives to attend antenatal clinic – paying antenatal service bills (96.5%), paying for transport to the clinic (94.6%) and reminding them of their clinic visits (83.3%).Furthermore, they found that more educated women were less likely to be accompanied to the antenatal clinic, while more educated men were likely to accompany their wives. They stated that women in the rural centre were less likely to receive help with household chores from their husbands during pregnancy, while educated women were more likely to benefit from this. They further stated that monogamous unions and increasing level of husbands' education were associated with spousal presence at delivery. They found that male participation was satisfactory in some aspects, but increased attendance at antenatal services and delivery would be desirable.

1.3 Study objective

The main objective of this study is to examine and understand the involvement of men during pregnancy and childbirth and explore its influence on pregnancy complications and neonatal mortality in Zambia.

1.3.1 Specific Objectives

- To find out the socio - economic and demographic determinants of men's involvement during pregnancy and childbirth in Zambia.
- To find out if female characteristics (women's autonomy, occupation and education level) do predict or determine men's involvement during pregnancy and childbirth in Zambia.

- To find out the role of mass media exposure in explaining men's involvement during pregnancy and childbirth in Zambia.

- To find out if men's involvement during pregnancy and childbirth does reduce pregnancy complications and neonatal mortality in Zambia.

- To find out whether men's involvement during pregnancy and childbirth in Zambia reduce delays one, two and three.

- To find out whether delays increase pregnancy complications and neonatal mortality in Zambia.

1.4 Main research Questions

- What is men's involvement during pregnancy and childbirth in Zambia?

- What are the determinants or predictors of men's involvement during pregnancy and childbirth in Zambia?

- What is the role of men's involvement during pregnancy and childbirth on pregnancy complications and neonatal mortality in Zambia?

- What is the role of delays on pregnancy complications and neonatal mortality in Zambia?

1.4.1 Sub research questions

- What are the socio - economic and demographic factors determining or predicting men's involvement during pregnancy and childbirth in Zambia?

- Do female characteristics (women's autonomy, occupation and education level) predict or determine men's involvement during pregnancy and childbirth in Zambia?

- What is the role of mass media exposure in explaining men's involvement during pregnancy and childbirth in Zambia?

- Does men's involvement during pregnancy and childbirth reduce pregnancy complications and neonatal mortality?

- Does men's involvement during pregnancy and childbirth reduce delays one, two and three?

- Do delays increase pregnancy complications and neonatal mortality?

1.5 Structure of the paper

This study is divided into five chapters. The first chapter consists of the background of the study, literature review, study objectives, and research questions. The second chapter discusses the three delays model, neonatal mortality, conceptual model, hypotheses, definition of concepts, measurement of variables, Zambian study context and also the paradigm used. The following chapter discusses the data and methodology of the study including the sample design, description of the data sets, quality of the data, data analysis including confounders and ethical issues. In chapter 4, the findings and results are discussed. Finally, conclusions and discussion including implications of the findings are given in chapter five.

Chapter Two

2.0 Theoretical Framework

2.1 Three delays model

This study adopted the 3 delays model by Thaddeus and Maine (1994) and backs up the need for men's involvement during pregnancy and child birth in order to reduce maternal deaths, neonatal deaths, pregnancy complications and disability. This model identifies individual decision making, access to affordable services, and the provision of skilled personnel as the main factors which can delay access to effective interventions to prevent pregnancy related disability and death. According to Abouzahr (2000) this model is based on the fact that about 75 percent of maternal deaths are a result of direct causes: hemorrhage, obstructed labour, sepsis, eclampsia and abortion complications. Most of these deaths are preventable with prompt and adequate medical interventions.

Delays in reaching adequate care are prominent factors contributing to maternal deaths. According to Thaddeus and Maine (1994) not getting adequate care in time is the overwhelming reason why women die in developing countries like Zambia. Lack of care, they argued, can be related to three factors: a delay in making the decision to seek care when complications arise; a delay in reaching obstetric medical facility once the decision to seek care has been made; or delay in receiving adequate and appropriate care once a medical facility has been reached. According to the model, delay in the decision to seek medical care may be influenced by various factors such as the actors involved in the decision making process, illness characteristics, and experience with the health system or distance to the health facility. Delay in reaching an appropriate medical facility is affected by the distribution of health facilities, availability of transportation, road conditions or cost of transportation. Delay in receiving adequate and appropriate care once the facility is reached is mainly due to operational difficulties in the health care delivery system. Such inadequacies may be characterized by shortages in supplies, equipment, lack of trained personnel, incompetence of available staff, or uncoordinated emergency services. The 3 delays model helps to identify community and health services factors contributing to maternal deaths and as such it is useful in devising interventions and strategies.

According to Gerein et al., (2003) when men get fully involved during pregnancy and childbirth delays alluded to in the model which normally result into maternal death, disability or negative sexual and reproductive health outcomes could be reduced. It is highly believed that there could be focused attention to preparation for childbirth by the pregnant woman and partner or spouse such as selecting a birth location, identifying a skilled attendant and companion for birth. Planning for costs, transportation and supplies for care of the women and the care of newborn could be done in advance (Gerein et al., 2003). McDonagh (1996) adds that with men involved during pregnancy and childbirth plans for both normal birth and emergency birth in case of complications could be established way in advance. The emergency plan could include transportation, money, blood donors, designation of a person to make decisions on the woman's behalf and a person to care for her family while she is away (McDonagh 1996; WHO 2003).Moreover, with full involvement it is assumed that the man could make prompt decisions on the woman's behalf and even take care of the house and children in case there are any while she is away. According to the World Health Organization (1996) because 15 percent of all pregnant women develop a life threatening complication and most of these complications cannot be predicted, every man, woman and their family must be ready to respond in case a problem occurs.

The three delays model has never been used or applied in any study that tries to explain neonatal deaths. However, this study particularly applies the model to explain neonatal deaths based on the assumption that maternal or pregnancy complications/deaths go hand in hand with neonatal deaths. Moreover, the well being of mother and newborn depends on the pregnancy care that a mother receives during her pregnancy. Newborn health and survival are closely linked to the care mother

receives before and during pregnancy, childbirth, and the postnatal period. Consequently, it is highly assumed that most neonatal deaths branch from poor maternal health, insufficient care during pregnancy, inapt management of complications during pregnancy and delivery, poor hygiene during delivery as well as lack of newborn care among others.

An emphasis on making emergency obstetric and newborn care available to all women who develop complications is central to reduce maternal and neonatal mortality. This is due to the fact that all five of the major causes of maternal mortality; haemorrhage, sepsis, unsafe abortion, hypertensive disorders and obstructed labour can be treated at a well staffed and well equipped health facility. In such settings, many newborns who might otherwise die can also be saved. In the long term, this means that all births should take place in appropriate health facilities, as is the case in all countries that have managed to significantly reduce their maternal and neonatal mortality. Timing proves to be critical in preventing maternal death, pregnancy complications and disability. Although post – partum haemorrhage can kill a woman in less than two hours, for most other complications, a woman has between 6 and 12 hours or more to get life saving emergency care. Similarly, most neonatal deaths occur during labour and childbirth, or within the first 48 hours thereafter. (ZDHS, 2007; WHO, 2006; UNICEF, 2004)

2.2 Neonatal mortality

Although being newborn is not a disease, large numbers of children die soon after birth: many of them in the first four weeks of life (neonatal deaths), and most of those during the first week (early neonatal deaths). For every baby who dies in the first week after birth, another is born dead (fetal deaths or stillbirths). Causes and determinants of neonatal deaths and stillbirths differ from those causing and contributing to postneonatal and child deaths. Neonatal deaths and stillbirths stem from poor maternal health, inadequate care during pregnancy, inappropriate management of complications during pregnancy and delivery, poor hygiene during delivery and the first critical hours after birth, and lack of newborn care. Several factors such as women's status in society, their nutritional status at the time of conception, early childbearing, too many closely spaced pregnancies and harmful practices, such as inadequate cord care, letting the baby stay wet and cold, discarding colostrum and feeding other food, are deeply rooted in the cultural fabric of societies and interact in ways that are not always clearly understood. (WHO, 2006)

In many societies, neonatal deaths and stillbirths are not perceived as a problem, largely because they are very common. Many communities have adapted to this situation by not recognizing the birth as complete, and by not naming the child, until the newborn infant has survived the initial period. Health workers at primary and secondary level of care often lack the skills to meet the needs of newborn infants, since the recognition of opportunity is only just emerging in countries, and their experience in this area is therefore limited.

2.2.1 Neonatal deaths

Babies die after birth because they are severely malformed, are born very prematurely, suffer from obstetric complications before or during birth, have difficulty adapting to extrauterine life, or because of harmful practices after birth that lead to infections. Around 1 percent of infants have a major congenital anomaly. These anomalies are more common in developing than in developed countries, especially those caused by diseases such as syphilis, or by nutrient deficiency, which leads to neural tube defects and cretinism. Low birth weight has long been debated as one of the causes of neonatal

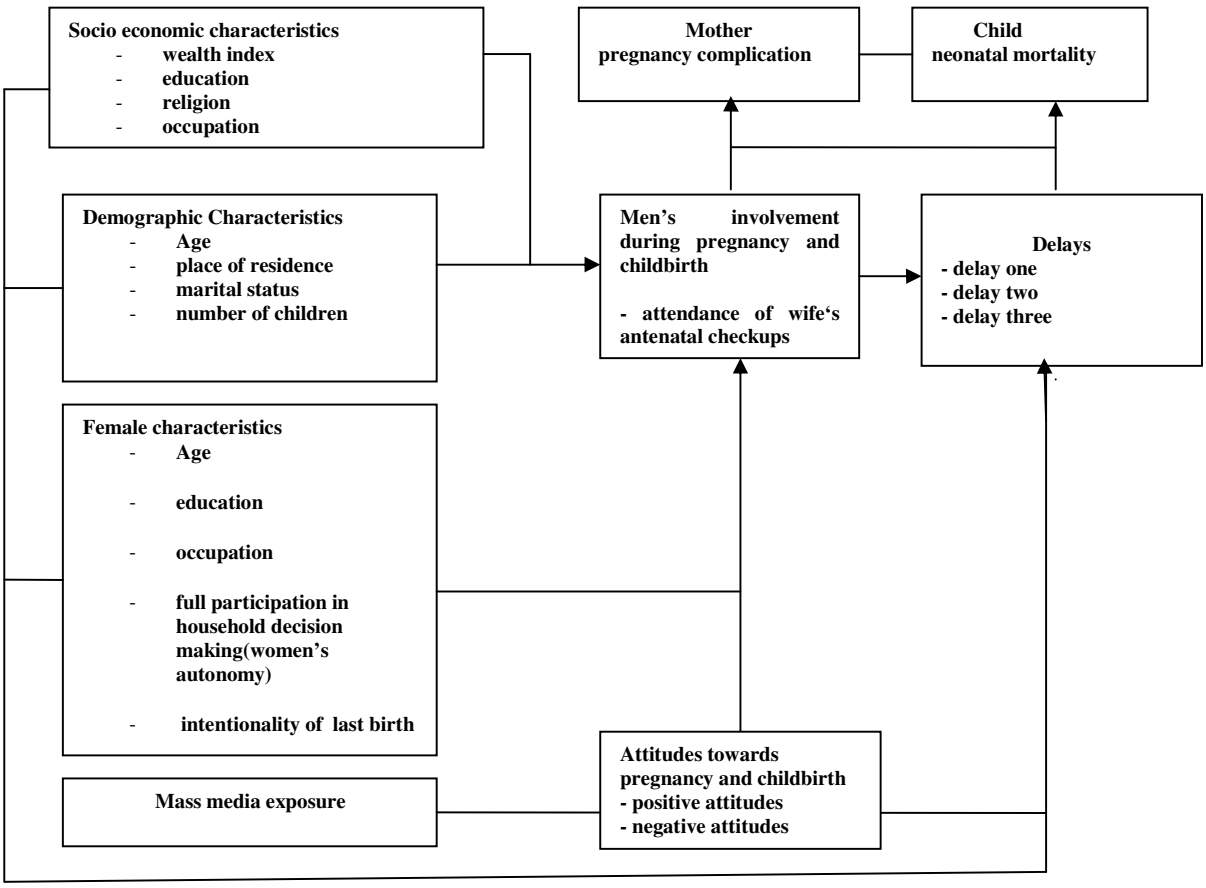
deaths. It is associated with the death of many newborn infants, but is not considered a direct cause. Around 15 percent of newborn infants weigh less than 2500 g, the proportion ranging from 6 percent in developed countries to more than 30 percent in some parts of the world (WHO, 2006; UNICEF, 2004).

Complications during birth, such as obstructed labour and fetal malpresentation, are common causes of perinatal death in the absence of obstetric care. Birth asphyxia and trauma often occur together and it is, therefore, difficult to obtain separate estimates. In the most severe cases, the baby dies during birth or soon after, due to damage to the brain and other organs. Less severe asphyxia and trauma will cause disability. Modern obstetric practices have almost eliminated birth trauma. Conversely, where modern obstetric care is not available, intrapartum or early postnatal deaths are very frequent. It is estimated that in developing countries asphyxia causes around seven deaths per 1000 births, whereas in developed countries this proportion is less than one death per 1000 births (WHO, 2006).

The majority of deaths occur soon after birth, some just before birth. Prolonged labour or prolonged rupture of membranes causes infections in mothers and babies. However, babies are more susceptible than mothers and infections in infants are more difficult to detect. It is estimated that 26 percent of newborn infants who die do so as a result of infections that occur around birth. Although during pregnancy the uterus protects the baby from environmental infections, some infections break through the safety barrier and affect the fetus. The most common are syphilis and HIV. In countries where maternal syphilis is prevalent, many babies are stillborn, die soon after birth or are infected themselves. (WHO, 2006)

Neonatal tetanus has been, and remains, a common cause of neonatal death in settings where lack of hygiene at birth and inadequate cord care are prevalent, as many women are not immunized against tetanus and cannot protect the baby at birth. The majority of deaths from neonatal tetanus occur between the seventh and tenth day of life. Through massive tetanus toxoid immunization efforts, neonatal tetanus has been almost eliminated from many countries. There are, however, over 50 countries where, in some districts, the proportion of cases of neonatal tetanus is 1 per 1000 births. After the first week of life, infections are the main cause of neonatal death in many countries. These are mostly acquired either in hospital as a complication of treatment for other perinatal conditions, or at home. Preterm infants are at greatest risk of becoming ill and dying. Harmful cord care practices cause neonatal tetanus if the mother is not protected by immunization; poor feeding practices cause diarrhoea and poor growth; an unhygienic environment causes sepsis. The relative contribution of each of these factors varies according to the health of the pregnant woman and the prevalence of endemic diseases such as syphilis or malaria, but mostly according to the availability of adequate care during pregnancy, childbirth and the neonatal period. Early neonatal deaths are mostly due to complications during pregnancy or childbirth, preterm birth and malformations; late neonatal deaths are due to neonatal tetanus and infections acquired either at home or in hospital, when complications in special neonatal care occur. (WHO, 2006; WHO, 2005; Serbanescu et al., 2001).

2. 3 Conceptual Model



2.4 Hypotheses

Possible researchable hypotheses of the study are as follows:

2.4.1 Determinants of men's involvement during pregnancy and childbirth

- Full female participation in household decision making (women's autonomy), women's occupation, age, intentionality of last birth and education level (Female characteristics) determine or predict men's involvement during pregnancy and childbirth in Zambia.

- Wealth index, education, and occupation (socio – economic characteristics) determine or predict men's involvement during pregnancy and childbirth in Zambia.

- Place of residence, marital status, birth order, number of living children, religion and respondent's age (men's demographic characteristics) determine or predict men's

involvement during pregnancy and childbirth in Zambia.

- Mass media exposure determines or predicts men's involvement during pregnancy and childbirth in Zambia.

- Urban men who happen to be protestants are more likely to be involved during pregnancy and childbirth in Zambia

- Men whose wives or partners work in non agriculture sectors and happen to come from rich socio – economic backgrounds are more likely to be involved during pregnancy and childbirth in Zambia.

- Urban men from rich socio – economic backgrounds are more likely to be involved during pregnancy and childbirth in Zambia.

- Men who work in non agriculture sectors and also happen to have wives or partners who work in non agriculture sectors are more likely to be involved during pregnancy and childbirth in Zambia.

2.4.2 Associations between men's involvement and delays, and pregnancy outcomes

- Men's involvement during pregnancy and childbirth is expected to reduce pregnancy complications in Zambia.

- Men's involvement during pregnancy and childbirth reduces neonatal mortality in Zambia.

- Men's involvement during pregnancy and childbirth reduce delays one, two and three in Zambia.

2.4.3 Influence of delays on pregnancy outcomes

- Delays are expected to increase pregnancy complications in Zambia.

- Delays are expected to increase neonatal mortality in Zambia.

2.4.4 Definition of concepts

Reproductive Health is a state of complete, physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. Reproductive health therefore implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so (WHO, 2007).

Sexual Health is the integration of somatic, emotional, intellectual and social aspects of sexual being, in ways that are positively enriching and that enhance personality, communication and love (WHO,

2001).

Male involvement in SRH includes encouraging men to become more involved and supportive of women's needs, choices, and rights in sexual and reproductive health; and addressing men's own sexual and reproductive health needs and behaviour (UNFPA, 2003).

Sexual and reproductive health care is defined as the constellation of methods, techniques and services that contribute to sexual and reproductive health and well-being through preventing and solving sexual and reproductive health problems (MOFNP, 2006).

Sexual and reproductive health services encompass three main areas: contraceptive services, maternal health services and services related to sexually transmitted infections (STIs), including HIV/AIDS and other gynecologic and urologic problems (WHO, 2001).

Antenatal care constitutes screening for health and socioeconomic conditions likely to increase the possibility of specific adverse pregnancy out - comes, providing therapeutic interventions known to be effective; and educating pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them(MOFNP, 2006).

Pregnancy is the period of reproduction during which a female carries one or more live offspring from implantation in the uterus through gestation. It begins when a fertilized zygote implants in the female's uterus; and ends once it leaves the uterus (ZDHS, 2007; MOFNP, 2006).

Childbirth includes both labour (the process of birth) and delivery (the birth itself); it refers to the entire process as an infant makes its way from the womb down the birth canal to the outside world (MOFNP, 2006).

Neonatal mortality (NN) is the probability of dying within the first month of life (ZDHS, 2007).

2.5 Measurement of Variables

2.5.1 Outcome or dependent Variables

Men's involvement during pregnancy and childbirth

It is difficult to measure men's involvement during pregnancy and childbirth by using a single indicator. Although it is multidimensional concept, this study utilizes men's attendance at the time of partner or wife antenatal checkups. All these involvement behaviours have been measured based on the men's reports. To measure husband's or men's presence at ANC, they were asked whether their partners or wife did have any antenatal checkups and furthermore, whether they were ever present at any antenatal checkups of their partners or wives. If the men's or husband's response was yes on the first two questions they were considered to have been involved during pregnancy and childbirth. Conversely, if the men's or husband's response was no on the first two questions they were considered not be involved during pregnancy and childbirth. In summary, the variable men's involvement during pregnancy and childbirth has been created and was categorized as involved and not involved.

Pregnancy complication

It is equally difficult to measure pregnancy complication using a single indicator. Although it is also multidimensional concept, this study utilizes last birth by ceasarean section and time spent at place of delivery as the measure of maternal health status. Based on the responses, a single variable (pregnancy complications) has been constructed having two responses: no complications and complications present. Pregnancy complications if the wife‘s or partner’s last birth was by ceasarean section and if the wife or partner spent one week or more at the place of delivery. Conversely, no pregnancy complications if the wife’s or partner’s last birth was not by ceasarean section and if the wife or partner spent less than a week at the place of delivery.

Neonatal mortality

Neonatal mortality is the number of deaths during the first 28 completed days of life per 1,000 live births in a given year or period. To measure neonatal mortality, neonatal mortality rates are calculated based on birth history, using a series of questions on each child a woman has given birth to during her life time. The estimates are generally presented as period rates for the five year periods preceding the survey. The total number of births in the survey provides the denominator. In summary, as shown below, neonatal mortality rate is calculated as the number of deaths within first month of life divided by the total number of births in the five years preceding the survey multiplied by 1000.

$$\frac{\text{Neonatal deaths}}{\text{Live births}} \times 1000$$

Delays

Delays act as a dependent variable in its relationship with men’s involvement during pregnancy and childbirth and on the other hand, in its relationship with pregnancy complications and neonatal mortality assume the role of an independent variable. Nevertheless, it is even more difficult to measure delays using DHS data based on Thaddeus and Maine’s (1994) three delays model. This due to the fact that DHS has no direct questions on the delays. Hence, to measure delays, men or husbands were asked the reason for not delivering their youngest child in health facility. Based on the responses and the assumption that every pregnancy is risky and that every birth should occur in a health facility or hospital and must be conducted by qualified health personnel. And furthermore, recording variable MV251 into a different variable called delays. In summary, a three level categorical variable was created for delays: delay one, delay two and delay three. Delay one consisted of responses such as; not the first child, mother did not think necessary, respondent did not think necessary, family did not think necessary, short labour , cost too much, do not trust facility or poor service including DK (do not know). However, delay two comprised of cost too much and too far or no transportation while delay three included facility closed, don’t trust facility or poor quality service, cost too much and no female provider. It suffices to note here that some reasons within the delays overlap from one delay to another.

2.5.2 Independent variables

Among the independent variables, age is measured by the man’s and woman’s completed age in years at the time of the survey. Age is classified into three groups: 15-24, 25-39 and 40 years and above. Educational attainment of the man and woman refers to whether he or she is literate. The last level of education attained successfully by the respondent decides respondent’s level of education. According

to education, men and women have been classified into three groups: No formal education, primary and secondary (1 – 12) and above (A levels, college and University). Mass media exposure and partner's autonomy are composite indices and their measurement is explained under construction of indices.

Wealth index is summary measure of socio-economic status of the respondent. The survey data categorizes it into five categories (poorest, poor, middle, rich and richest), but for analytical purposes, it is categorized into three categories: poor (combining poorest and poor), moderate and rich (combining rich and richest). In this study, occupation refers whether the respondent is currently working or not. It encompasses three groups: not working, working in agriculture and non agriculture sectors. A four level categorical variable was created for employment status: only the husband worked for pay, only the wife worked for pay, both wife and husband worked for pay, and neither wife nor husband worked for pay.

Place of residence is a usual place of living at the time of survey and has been grouped as rural and urban. Children ever born refer to the total number of children born. Pregnancy intention or the intentionality of last birth according to the man has been grouped as mistimed, unwanted and intended. Furthermore, the child's birth order has been grouped as first birth and higher order. Moreover, the man's relationship to the child's mother around the time of pregnancy has been grouped as married/consensual union and other relationship such as cohabiting or living together. Religion is quantified by means of respondents' possession of particular religious belief. Although the survey has collected information on various religious groups (Catholic, Protestant, Muslim and others), it is grouped as Catholic, Protestant and others, firstly, because the majority of the population in Zambia is Christian (catholic and protestant) and secondly, for analytical purposes. Similarly, to measure men's or husband's positive attitudes towards pregnancy and child bearing, they were asked to agree or disagree to the statements that: (a) Child bearing is a woman's concern and there is no need for the father to get involved. (b) It is crucial for the mother's and child's health that a woman have assistance from a doctor or nurse at delivery. If the men or husband response agreed to the above statements they were considered to have positive attitudes towards pregnancy and childbirth. Conversely, if the men or husbands disagreed to the above statements they were considered to have negative attitudes towards pregnancy and childbirth. In summary, the variable men's attitude towards pregnancy and childbirth has been created and was categorized as negative and positive attitudes.

2.5.3 Construction of indices

Mass Media exposure

Mass media exposure is a compound or merged measure, which has been computed based on the information whether respondent listens to radio daily, watches television at least once in a week and reads newspapers at least once in a week. Specifically, the following questions have been used to measure mass media exposure :(1) do you read a newspaper or magazine almost every day, at least once a week, less than once a week or not at all ? (2) Do you listen to the radio almost every day, at least once a week, less than once a week or not at all (3) do you watch television almost every day, at least once a week, less than once a week or not at all? Mass media exposure encompasses four categories: not exposed to any media, at least one, any two and all three media but for analytical purposes, it has been further categorized into three groups; low (those who have either not been exposed or exposed to any one), moderate (exposed to any two) and high (exposed to all three media).

Women's autonomy

It is difficult to choose an appropriate indicator for measuring women's empowerment. However, women's autonomy is measured based on the decision variables related to households and their childbearing activities. For the construction of women's autonomy, it utilizes five questions: (1) Who usually makes decisions about making major household purchases? (2) Who usually makes decisions about making purchases for daily household needs? (3) Who usually makes decision about visits to your family or relatives? (4) Who usually decides how the money you earn will be used? (5) Who usually decides on how many children to have? .In short, the questions give information on final say about, number of children to have, large household purchases, household purchase for daily needs, final say on visits to family or relatives, and deciding how to spend money wife (woman) earns. On the basis of this information, three decision making index variables ranging from - 5 to 5 have been created representing: (1) the number of decisions in which the wife or partner alone final say (2) the number of decision in which husband and wife or partner final say and (3) the number of decisions in which the husband alone final say. Variable (1) correspond to women who are more 'empowered' (in which the final say totally rests on wife or partner). Similarly, variable (2) correspond to more gender equal couples in which both (husband and wife or partner) have equal responsibilities of giving final decision. In contrast, variable (3) corresponds to women who are 'disempowered' (in which husband dominates on final say).

2.6 Zambian study context

Zambia has a population of about 12 million people, and administratively, the country is divided into nine provinces and 72 districts. Of the nine provinces, two are predominantly urban, namely Lusaka and Copperbelt provinces. The remaining provinces namely Central, Eastern, Northern, Luapula, North-Western, Western, and Southern are predominantly rural provinces. Lusaka is the capital city of Zambia and seat of government. The government comprises of the Central and Local government (ZDHS, 1996). More than 65 percent of the population lives in rural areas. Life expectancy is relatively very low (43 years), and in terms of education 74.8 percent of the females and 86.8 percent of the males are able to read and write. Zambia also suffers from deep and persistent poverty with around 87.4 percent of its population living below the $ 2 a day poverty line (UNAIDS, 2007). The country is still recovering from the world financial crisis. Also like, most countries, Zambia is characterized by gender inequality that generally favours men socially, culturally, economically, and politically, though progress in some areas, such as education, is evident.

According to the 2007 ZDHS data, about 41 percent of married women aged 15 to 49 were then using a family planning method, and a similar proportion of men aged 15 to 59 were doing so. The most common method reported by both men and women was pill (11 percent) followed by injectables (9 percent) and male condom (5 percent) while withdrawal (6 percent) is the most common traditional method. Zambia still experiences the highest levels of unmet need for family planning, where approximately 27 percent of married women and 18 percent overall (including the unmarried) have an unmet need for family planning. Unmet need for family planning has led to high unintended pregnancies, which pose risks for women, newborns, their families, and societies .Fertility rates have decreased by one birth over the 27 year period from 7.2 births per woman at the time of the 1980 census to 6.2 births in the 2007 ZDHS. During this time the average age of the Zambian women at first marriage rose by three years(16 to 19 years), though their age at first birth rose only slightly (ZDHS, 2007; MOFNP, 2006). Prenatal care is somehow common and half of all births (52 percent) occur at home. Only 48 percent are hospital deliveries and looking at the type of facility, 43 percent of deliveries occur in public sector facilities and 5 percent occur in private sector facilities. According to the 2007 ZDHS, 97 percent of women who had a live birth in the five years preceding the survey

had at least one antenatal care visit. Sixty percent of women reported visiting antenatal clinics at least four times during pregnancy, and 34 percent reported two to three antenatal visits during their last pregnancy. Furthermore, only about one-fifth (19 percent) of women had their first antenatal visit in the first trimester of pregnancy. Nonetheless, about three-fourths (73 percent) of women have their first ANC visit before six months of pregnancy, and more than half (53 percent) of women attend their first antenatal visit between their fourth and fifth month of pregnancy. Additionally, the median number of months of pregnancy at the first ANC visit is five months. A quarter of women continue to delay the initiation of antenatal care until after their sixth month of pregnancy, thus missing out on potential benefits of early antenatal care services. Differentials do not vary much by urban and rural residence and the national cesarean rate in 2007 was estimated at 3 percent. (WHO, 2007; ZDHS, 2007; MOFNP, 2006)

2.7 Paradigm Used

The study is grounded on logical positivism and as such it adopts an empirical and actual dimension. It requires using mathematical, logico-linguistic constructs and deductions in analysis and presentation of experienced facts. Therefore, it will rely on secondary analysis of other quantified data set

Chapter Three

3.0 Data and Methodology

3.1 Sample design

The study is a quantitative study and used secondary data obtained from the 2007 Zambia Demographic and Health Survey. The data set was collected by the Zambia Central Statistical Office (CSO) in partnership with the Ministry of Health. The sample for the 2007 ZDHS was designed to provide estimates of population and health indicators at the national and provincial levels. The sample design allowed for specific indicators, such as contraceptive use, to be calculated for each of the nine provinces (Central, Copperbelt, Eastern, Lusaka, Luapula, Northern, North-Western, Southern, and Western). The sampling frame used for the 2007 ZDHS was adopted from the Census of Population and Housing of the Republic of Zambia (CPH) conducted in 2000, provided by the CSO. The frame consists of 16,757 standard enumeration areas (SEA) created for the CPH 2000. A SEA is a convenient geographical area with an average size of 130 households or 600 people. A SEA contains information about its location, the type of residence, the number of households and the number of males and females in the population. Each SEA has a cartographical map, which delimits the boundaries and shows the main landmarks of the SEA.(ZDHS 2007; ZDHS, 2001/02)

A representative sample of 8,000 households was drawn for the 2007 ZDHS survey. The sample for ZDHS 2007 was a stratified sample selected in two stages from the CPH 2000 frame. Stratification was achieved by separating every province into urban and rural areas. Therefore, the nine provinces were stratified into 18 sampling strata. Samples were selected independently in every stratum by a two-stage selection. Implicit stratifications and proportional allocation was achieved at each of the lower geographical or administrative levels by sorting the sampling frame according to the geographical or administrative order and by using a probability proportional to size selection at the first stage sampling.(ZDHS 2007; ZDHS, 2001/02)

In the first stage, 320 SEAs were selected with probability proportional to the SEA size. The final survey sample included 319 clusters instead of 320 clusters. During fieldwork, access was not granted for the field team to conduct data collection exercises in one cluster. The household listing operation was conducted in all selected SEAs, with the resulting lists of households serving as the sampling frame for the selection of households in the second stage. Selected SEAs with more than 300 households were segmented, with only one segment selected for the survey with probability proportional to the segment size. Household listing was conducted only in the selected segment. Therefore, a ZDHS 2007 cluster is either an SEA or a segment of an SEA. In the second stage selection, an average number of 25 households were selected in every cluster, by equal probability systematic sampling. A complete listing of households and a mapping exercise was carried out for each cluster in August 2006. All private households were listed. The listing excluded people living in institutional households (army barracks, hospitals, police camps, boarding schools, etc.). CSO listing enumerators were trained to use Global Positioning System (GPS) receivers to record the geographic coordinates of the 2007 ZDHS sample clusters.(ZDHS, 2007; ZDHS, 2001/02)

3.2 Description of the data sets

In the 2007 Zambia Demographic and Health Survey, the data consisted of 7146 females and 6500 males. All women age 15-49 and all men age 15-59 who were either permanent residents of the

households in the 2007 ZDHS sample or visitors present in the household on the night before the survey were eligible to be interviewed. Three questionnaires were used for the 2007 ZDHS. These are the Household Questionnaire, the Women's Questionnaire, and the Men's Questionnaire. These questionnaires were based on questionnaires developed for the MEASURE DHS programme and were adapted to reflect the population and health issues relevant to Zambia at a series of meetings with various stakeholders from government ministries and agencies, non-governmental organizations, and international donors. In addition to English, the questionnaires were translated into seven major local languages, Nyanja, Bemba, Kaonde, Lunda, Lozi, Tonga, and Luvale.

The Household Questionnaire was used to list all the usual members and visitors of selected households. Some basic information was collected on the characteristics of each person listed, including age, sex, education, and relationship to the head of the household. The Women's Questionnaire was used to collect information from all women age 15-49.These women were asked questions on the following main topics among others; background characteristics (education, residential history, media exposure, etc.),birth history and childhood mortality, knowledge and use of family planning methods, fertility preferences, antenatal and delivery care. Furthermore, questions were asked on breastfeeding and infant feeding practice, vaccinations and childhood illnesses, marriage and sexual activity, women's work and husband's background characteristics, women's and children's nutritional status, including adult and maternal mortality. The Men's Questionnaire was administered to all men age 15-59 in each household in the 2007 ZDHS sample. The Men's Questionnaire collected much of the same information found in the Women's Questionnaire, but was shorter because it did not contain a detailed reproductive history or questions on maternal and child health or nutrition. Furthermore, from the men's and women's questionnaires, the men and women files were created and later on merged to create the couple file. In other words, the women's and men's data sets were merged and matched according to couples. (ZDHS ,2007; ZDHS, 2001/02)

3.3 Quality of data

The Zambia Demographic and Health Survey data is prone to a lot of errors because it provides detailed information on various demographic variables. According to Sullivan (2008) sources of errors in the DHS direct mortality estimation are: misreporting of date of birth (birth transference), underreporting of events ,misreporting of age at death, unrepresentative sample and incorrect procedure for transforming data into mortality estimation. For example, Child mortality data is subject to numerous quality problems. For example, it should be noted that mortality estimates are based on retrospective birth histories that are provided based on the mother's ability to recall all of the children she had given birth to, as well as their birth dates and age at death. As such, it is possible to have selective omission from the birth histories. Further, accuracy of this data is also in question because traditionally and culturally, people, especially mothers, often do not discuss deaths because it is taboo. Such omissions can result in an underestimation of the level of childhood mortality. When selective omission of childhood deaths occurs, it is usually more severe for deaths occurring early in infancy. Generally, if there is substantial underreporting of deaths, the result is an abnormally low ratio of early neonatal deaths (deaths within the first week of life) to all neonatal deaths, and an abnormally low ratio of neonatal deaths to infant deaths. Another potential data quality problem involves the displacement of birth dates, which may cause a distortion of mortality trends. This can occur if an interviewer knowingly records a death as occurring in a different year, which would happen if an interviewer is trying to cut down on his or her workload, because births occurring during the five years preceding the interview are the subject of a lengthy set of additional questions. For example, a net transfer of deaths from under one month to a higher age will affect the estimates of neonatal and post neonatal mortality.(Sullivan, 1994; Sullivan, 2008; ZDHS, 1996; ZDHS 2007)

A review of studies on underreporting indicates that, while both live births and neonatal deaths may be under reported, fetal deaths are much more likely to go unreported (WHO, 2006). Moreover, the earlier the gestational age and the lower the birth weight, the less likely it is that birth and death will be reported. Furthermore, the definition of the pregnancy duration for stillbirth in general has changed overtime. Originally, it was the product of pregnancies lasting 28 weeks that ended in a fetal death. The duration limit was subsequently lowered to 24, 22 and even 20 weeks. For the purpose of calculating perinatal mortality, however, the definition remains at 28 weeks. DHS asks and records pregnancy duration in months so that the equivalent of seven months is used. The durations of pregnancy are taken as reported by the respondents and do not necessarily have a clinical basis.(WHO, 2006)

To minimize errors in reporting of age at death, ZDHS interviewers were instructed to record age at death in days if the death took place in the month following the birth, in months if the child was older than one month or up to at least two years, and in years if the child was more than two years of age. Interviewers also were instructed to probe for death reported as occurring at one year of age, to determine a more precise age at death in months. Since, one of the primary goals of the DHS program is to produce high quality data and make it available for analysis in a coherent and consistent form. In order to achieve this goal and avoid data quality problems, the DHS program has adopted a policy of editing and imputation which results in a data file that accurately reflects the population studied and may be readily used for analysis.The DHS also uses sampling weights which are adjustment factors applied to each case in tabulations to adjust for differences in probability of selection and interview between cases in a sample, either due to design or fluke. For instance, according to MEASURE DHS, in a nationally representative survey, many times the sample is selected with unequal probability to expand the number of cases available for certain areas or subgroups for which statistics are needed. In this case, weights need to be applied when tabulations are made to produce the proper representation.(ZDHS, 2007; ZDHS, 1996)

3.4 Data analysis

Understanding variables and their properties is essential to understanding statistical analysis. A random variable can be qualitative (descriptive with no intrinsic numerical value) or quantitative (with intrinsic numerical value). A random quantitative variable results when numerical values are assigned to results of measurement or counting. It is called a discrete random variable if the assignment is based on counting. It is called a continuous random variable if the numerical assignment is based on measurement. The numerical continuous random variable can be expressed as fractions and decimals. The numerical discrete can only be expressed as whole numbers. Choice of the technique of statistical analysis depends on the type of variable. Many mistakes in data analysis arise from not knowing the difference between discrete and continuous variables and wrongly applying the wrong statistical technique. (Kasule, 2004)
Furthermore, data analysis is essentially construction and testing of hypotheses. Two procedures are employed in statistical analysis. The test for association is done first. The assessment of the effect measures is done after finding an association. Effect measures are useless in situations in which tests for association are negative. The tests for association commonly employed are: t-test, chi-square, the linear correlation coefficient, and the linear regression coefficient. The effect measures commonly employed are: Odds Ratio, Risk Ratio etc (Kasule, 2004; Jaccard, 2001).
Logistic regression is a class of regression where the independent variable is used to predict the dependent variable. In logistic regression, the dependent variable is dichotomous. When the dependent variable has two categories, then it is binary logistic regression. When the dependent variable has more than two categories (Polytomous), then it is multinomial logistic regression.

Furthermore, the logistic regression model (also called the logit model) is the log of the odds (ratio of probability of success to failure) and is given by:

$\text{Log } (\Pi/1-\Pi) = \beta 0 + \beta 1X1 + \beta 2X2 + \ldots\ldots..$ Or $\text{Logit } (\Pi) = \beta 0 + \beta 1X1 + \beta 2X2 + \ldots\ldots..$

Where, Π is the probability of success and Xi denotes explanatory variables (independent variables) which may be either numerical or categorical. However, β is the change in the log-odds if X changes by 1 unit or the change in the log odds of being in a category compared to being in the reference group. Furthermore, β-coefficient and odds values give the direction and strength of the relationship. Therefore, a positive sign for β value refers to positive direction whereas a negative sign refers to reverse direction. The odds ratio, E (β) is defined as a measure of relative risk of being in that group as compared to the reference group. E (β) = odds and odds = probability of an event/probability of non event. Additionally, looking at estimated values and the P-value in Chi-square test, we are able to get a clear picture about whether the variables are significant or not.

Univariate, bivariate and multivariate analyses and most importantly logistic regression models have been used in this study. Logistic regression models have been used to examine, understand and provide information on men's involvement during pregnancy and child birth and also maternal health status in Zambia. Binomial logistic regression, in particular, has been used to predict or determine the determinants of men's involvement during pregnancy and childbirth in Zambia. Furthermore, to explain the influence of men's involvement during pregnancy and child birth on pregnancy complications. The dependent variable for binomial logistic regression for the first part is men's involvement during pregnancy and childbirth which is dichotomous (not involved/involved) and the second part is pregnancy complications also dichotomous (no pregnancy complications/ complications present). However, multinomial logistic regression has been used to predict the determinants of Delays which is polytomous (delay one, delay two, and delay three). Additionally, multinomial has been used to explain the influence of men's involvement during pregnancy and childbirth on the delays. Only the associations, which are statistically significant up to 10.0 percent level of significant, will be discussed. A statistical package for social sciences (SPSS) version 16.0 has been used to analyze the data.

3.4.1 Confounders

In this study, we also looked at confounders, firstly in the relationship between men's involvement during pregnancy and childbirth and pregnancy complications. Secondly, in the relationship between men's involvement during pregnancy and childbirth and neonatal deaths. A variable was considered to be a confounder if it satisfied the following criteria: (i) it was associated with both exposing and the response variables at ($P<0.10$) (ii) it changed the coefficient (B) in the logistic model by more than 10 percent (iii) and lastly, if it was outside the causal chain (http://www.amazon.com/Modern-Epidemiology-Kenneth-J-Rothman/dp/0316757802).

3.5 Ethical issues

Since this study is based on the 2007 Zambia Demographic and Health Survey data, consent for using the data set was obtained from MEASURE DHS, which is the main funder and custodian of the data set, hence, the recognized relevant authority. The condition for accessing and using the data set was that the final copy of this report be sent to MEASURE DHS. Furthermore, analysis and reporting will be precisely and accurately done in accordance with the goal of MEASURE DHS of maintaining high standards in terms of data quality and accuracy. The study output will be published in aggregated data and therefore, confidentiality of individual respondents will be completely maintained.

Chapter four

4.0 Findings and results

The objective of this chapter is to provide and present the findings and results of the study. Through frequency and percent distributions, the chapter begins by describing men's socio – economic and demographic characteristics including selected women's and couples characteristics. This is followed by cross tabulations of all selected independent variables against dependent variables. Next using the different logistic models, results are shown, discussed and interpreted.

4.1 Descriptive statistics

4.1.1 Percent and frequency distributions

4.1.1.1 Men's socio – economic and demographic characteristics

Only men who had one or more children were selected from the sample. Furthermore, the children had to be born 5 years or less preceding the survey. Therefore, about 623 men were dropped from the analysis and the remaining total sample was 2506.

Table 4.1 shows the percent distribution of men's socio – economic and demographic characteristics based on the couple file in the 2007 ZDHS by key background characteristics (independent variables) including age, type of place of residence, marital status, religion, educational attainment, occupation, number of children, mass media exposure as well as men's attitudes towards pregnancy . A high proportion of men are in the age group 25 – 39 (66.4 percent) compared with other age groups. Among men, 99.6 percent are married while only 0.4 percent are living together. Additionally, 86.7 percent of men have had some form of primary and secondary education (86.7 percent).In terms of mass media exposure 30.5 percent have low exposure, while less than 18.0 percent of men have high exposure. Regarding occupation, more than half of the men work in agriculture sectors (53.7 percent) with only slightly more than two fifths working in non agriculture sectors (44 percent).Like wise, 75.5 percent of men have three children or more, whereas only 10.0 percent have one child. The sample comprises a higher proportion from rural areas.

Table 4.1- Background characteristics of male respondents (independent variables) Percent distribution of some independent variables in the study sample, Zambia (2007)

Independent variables (Background Characteristics)	Percent (%)	Number
Demographic characteristics		
Men's age		
15 - 24	7.0	176
25 - 39	66.4	1,664
40+	26.6	666
Type of place of residence		
Urban	32.1	804
Rural	67.9	1,702
Marital status		
Married	99.6	2,496
Living together	0.4	10
Number of children		
One	9.8	246
Two	14.7	369
Three and above	75.5	1,891
Religion		
Catholic	20.0	500
Protestant	76.4	1,915
Others	3.4	86
Socio - economic characteristics		
Education attainment		
No formal education	6.4	160
Primary education	52.6	1,317
Secondary and above	41.1	1,029
Occupation		
Not working	1.5	37
Working in agriculture sectors	53.7	1,345
Working in non agriculture sectors	44	1,102
Other Characteristics		
Mass media exposure		
Low	30.5	765
Moderate	52.6	1,318
High	16.6	417
Men's attitudes on pregnancy and childbirth		
Negative attitudes	83.6	2,095
Positive attitudes	16.4	411

4.1.1.2 Women's and couple characteristics

Table 4.2 shows the percent distribution of women's and couple characteristics by key background characteristics (independent variables) including age, educational attainment, occupation, intentionality of last birth and women's autonomy. A high proportion of women (about 63 percent) have some form of primary education. Among women, 41 percent are not working, while 36 percent are working in agriculture sectors and slightly more than one - fifth working in non agriculture sectors (23 percent). In terms of women's autonomy the majority of the women are disempowered (54 percent) whilst far less women are empowered (6 percent).Regarding wealth index, more than two – fifth (43.3 percent) of the couples are from poor socio – economic background , while 35 percent are from rich socio – economic background.

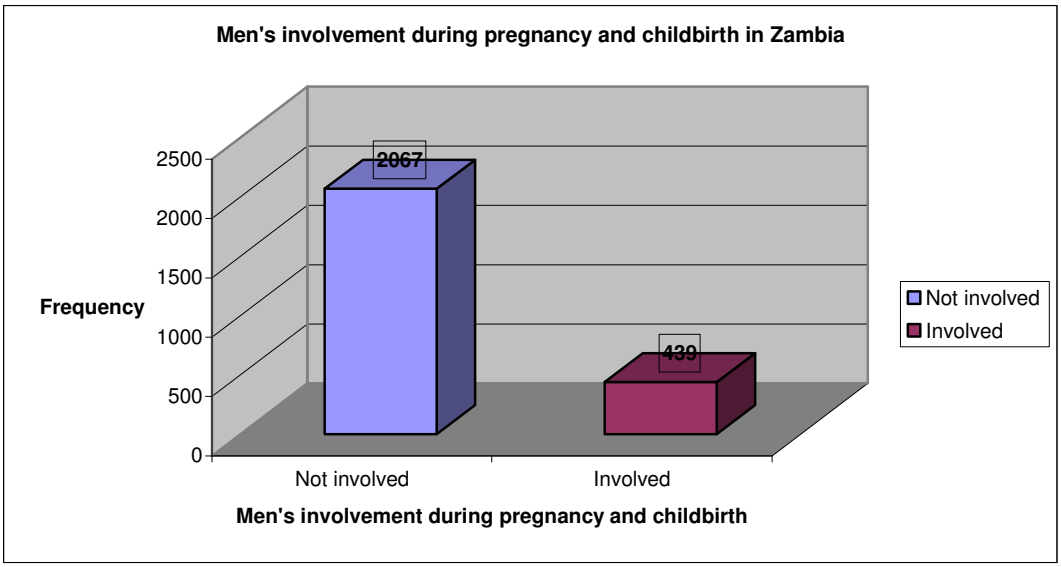
Table 4.2 - Selected characteristics of couples and female respondents (independent variables): Percent distribution of some independent variables in the study sample, Zambia (2007)

Independent variables (Background Characteristics)	Percent (%)	Number
Women's characteristics		
Women's age		
15 - 24	28.4	712
25 - 39	62.3	1,562
40+	9.3	232
Women's education attainment		
No formal education	13.2	331
Primary education	63	1,578
Secondary and above	23.8	597
Women's occupation		
Not working	41.0	1,027
Working in agriculture sectors	36.0	901
Working in non agriculture sectors	23.0	577
Women's autonomy		
Disempowered	54.0	1,354
Equal responsibilities	38.1	954
Empowered	6.0	151
Intentionality of last birth		
Intended	53.1	1,330
Mistimed	25.5	639
Unwanted	14.1	365
Couple characteristics		
Wealth index		
Poor	43.3	1,084
Moderate	21.7	545
Rich	35.0	877
Place of delivery of last birth		
Not in hospital/health facility	42.6	1,068
Hospital/health facility	47.8	1,198

4.1.1.3 Men's involvement, delays, pregnancy complications and neonatal deaths

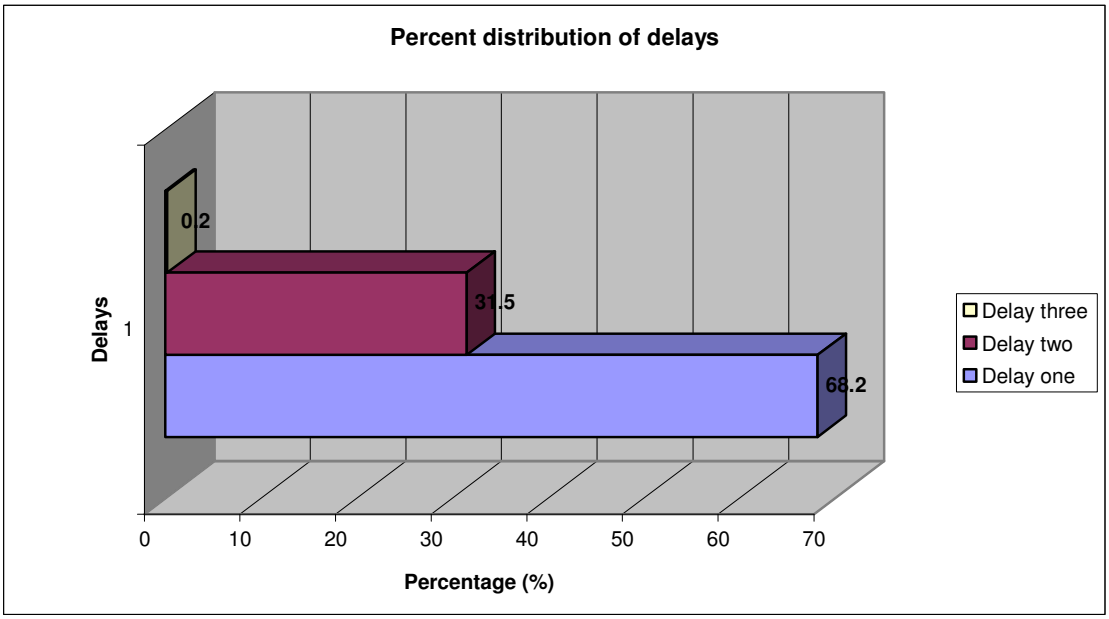
Figure 4.1 shows the frequency distribution of men's involvement during pregnancy and childbirth. As revealed by the figure, more than 2000 men (82.5 percent) are not involved during pregnancy and childbirth in Zambia. Likewise, only 439 men (17.5 percent) are involved in pregnancy and childbirth in Zambia. In general, more than three – quarters of the men are not involved whereas less than a quarter of men are involved during pregnancy and childbirth.

Figure 4.1 Frequency distribution of men's involvement during pregnancy and childbirth



Furthermore, figure 4.2 below, shows that the majority of the men and their wives or partners delayed in making a decision to seek care when their wives or partners were experiencing an obstetric complication (66.2 percent – delay one) with only 31.5 and 0.2 percent delaying in reaching an appropriate health care facility (delay two) and delaying in receiving adequate and appropriate care once the health facility has been reached (delay three) respectively. By and large, in absolute numbers, about 728 men and their wives or partners delayed in making a decision to seek care when their wives or partners were experiencing an obstetric complication compared to 336 and 2 for delaying in reaching an appropriate health care facility and delaying in receiving adequate and appropriate care once the health facility has been reached, respectively.With regards to pregnancy complication, the majority of men (2,377, about 95 percent) reported no complications while about 129 men (5 percent) reported that complications were present. Additionally, there were a total of 268 deaths based on the selected cases in the five years preceding the survey. Among the deaths, there were more single deaths (222) compared to two and more deaths (46).

Figure 4. 2 - Percent distribution of the three delays



4.2 Cross tabulations (Associations of variables)

4.2.1 Determinants of men's involvement during pregnancy and childbirth

4.2.1.1 Male characteristics

Table 4.3 is an overall cross tabulation of men's socio – economic as well as demographic variables and their involvement during pregnancy and childbirth in Zambia. From table 4.3 it can be observed that men's involvement is higher in rural as compared to urban areas (p=0.002). Men's involvement is also high for protestants as compared to catholic's and others (p=0.031).Furthermore, men who do not work are more involved than those who do (p=0.025). In summary, only type of residence, religion, and occupation are the determinants or predictors of men's involvement during pregnancy and childbirth in Zambia. In other words, this implies that typically, a man that is involved during pregnancy and childbirth is unemployed protestant, living in rural areas.

Table 4.3 - Cross tabulations of all selected independent variables against men's involvement during pregnancy and childbirth in Zambia

Selected independent variables	Men's involvement during pregnancy and childbirth			
	Not involved (%)	Involved (%)	Total % (N)	Chi - square test
				Asymp. Sig.(2 - sided)
Demographic characteristics				
Men's age				**0.206**
15 - 24	79.5	20.5	100 (176)	
25 - 39	83.4	16.6	100 (1664)	
40+	80.5	19.1	100 (666)	
Type of place of residence				****0.002**
Urban	85.9	14.1	100 (804)	
Rural	80.8	19.2	100 (1702)	
Marital status				**0.836**
Married	82.5	17.5	100 (2496)	
Living together	80.0	20.0	100 (10)	
Number of children				**0.342**
One	81.3	18.7	100 (246)	
Two	85.1	14.9	100 (369)	
Three and above	82.1	17.9	100 (1891)	
Religion				***0.031**
Catholic	82.4	17.6	100 (500)	
Protestant	82.0	18.0	100 (1915)	
Others	93.0	7.0	100 (86)	
Socio - economic characteristics				
Education attainment				**0.77**
No formal education	83.1	16.9	100 (160)	
Primary education	82.9	17.1	100 (1317)	
Secondary and above	81.8	18.2	100 (1029)	
Occupation				***0.025**
Not working	73.0	27.0	100 (37)	
Working in agriculture sectors	81.1	18.9	100 (1345)	
Working in non agriculture sectors	84.6	15.4	100 (1102)	
Other characteristics				
Mass media exposure				**0.159**
Low	84.6	15.4	100 (765)	
Moderate	81.3	18.7	100 (1318)	
High	82.5	17.5	100 (417)	
Men's attitudes towards pregnancy and childbirth				**0.670**
Negative attitudes	82.3	17.7	100 (2095)	
Positive attitudes	83.2	16.2	100 (411)	

Note: +p<0.10, * =p<0.05, ** =p<0.01 and ***=p<0.001

4.2.1.2 Women's and couple characteristics and men's involvement

Table 4.4 is an overall cross tabulation of women's as well as couple variables and men's involvement during pregnancy and childbirth in Zambia. From table 4.4, it can be revealed that men whose wives work in agriculture sectors are more involved compared to those whose wives are not working and working in non agriculture sectors. Furthermore, men from poor socio- economic backgrounds are more involved in comparison to those from moderate and rich socio- economic backgrounds. In summary, women's occupation (p=0.000) and couple's wealth index (p=0.000) determine or predict men's involvement during pregnancy and childbirth in Zambia. This entails that

a woman whose husband is involved during pregnancy and childbirth is a farmer or working in agriculture sectors living under poor socio – economic conditions.

Table 4.4 - Cross tabulations of women's and couple characteristics against men's involvement during pregnancy and childbirth

Selected independent variables	Men's involvement during pregnancy and childbirth			
	Not involved (%)	Involved (%)	Total % (N)	Chi - square test
				Asymp. Sig.(2 - sided)
Women's characteristics				
Women's age				**0.637**
15 - 24	83.6	16.4	100 (712)	
25 - 39	81.9	18.1	100 (1562)	
40+	82.8	17.2	100 (232)	
Women's education attainment				**0.822**
No formal education	81.3	18.7	100 (331)	
Primary education	82.6	17.4	100 (1578)	
Secondary and above	82.7	17.3	100 (597)	
Women's occupation				*****0.000**
Not working	86.5	13.5	100 (1027)	
Working in agriculture sectors	75.9	24.1	100 (901)	
Working in non agriculture sectors	85.6	14.4	100 (577)	
Intentionality of last birth				**0.144**
Intended	81.2	18.8	100 (1330)	
Mistimed	81.1	18.9	100 (639)	
Unwanted	85.5	14.5	100 (365)	
Women's autonomy				**0.991**
Disempowered	82.3	17.7	100 (1354)	
Equal responsibilities	82.4	17.6	100 (954)	
Empowered	82.2	17.2	100 (151)	
Couple characteristics				
Wealth index				*****0.000**
Poor	78.8	21.2	100 (1084)	
Moderate	84.4	15.6	100 (545)	
Rich	85.9	14.1	100 (877)	

Note: +=p<0.10, * =p<0.05 , ** =p<0.01 and ***=p<0.001

4.2.2 Determinants of delays

Table 4.5 is an overall cross tabulation of men's socio – economic as well as demographic variables against delays in Zambia. From table 4.5 it can be observed that men who are more educated (secondary and above) delay more in making a decision to seek care when their wives or partners are experiencing an obstetric complication as compared to those with no education and primary education. Furthermore, they do not delay at all in receiving adequate and appropriate care once the health facility has been reached (p=0.091). Additionally, men with positive attitudes towards pregnancy and childbirth delay more in reaching an appropriate health care facility in case of complications as compared to those with negative attitudes. It can further be observed that men who are involved during pregnancy and childbirth only delay less in receiving adequate and appropriate care once the facility has been reached as compared to those who are not involved

(p=0.011).Apparently, if the man is more educated his woman may be influenced by various issues and actors involved in the decision making process such as; failure to recognise complications, acceptance of maternal death, low status of women and also socio-cultural barriers to seeking care: women's mobility, ability to command resources, decision-making abilities, beliefs and practices surrounding childbirth and delivery, nutrition and education. Additionally, if a man is involved during pregnancy and childbirth his woman may not be influenced by inadequate facilities, supplies, personnel, poor training and demotivation of personnel and lack of finances .

Table 4.5 - Cross tabulations of all selected independent variables against delays in Zambia

Selected independent variables	**Delays**				
	Delay one (%)	**Delay two (%)**	**Delay three (%)**	**Total % (N)**	**Chi - square test**
					Asymp. Sig.(2 - sided)
Demographic characteristics					
Men's age					**0.486**
15 - 24	61.0	39.0	0.0	100 (82)	
25 - 39	68.3	31.9	0.3	100 (706)	
40+	70.5	29.2	0.4	100 (0.4)	
Type of place of residence					**0.185**
Urban	67.4	32.4	0.0	100 (954)	
Rural	75.7	24.3	0.0	100 (115)	
Marital status					**0.394**
Married	68.2	31.6	0.2	100 (1065)	
Living together	100.0	0.0	0.0	100 (4)	
Number of children					**0.904**
One	66.7	33.3	0.0	100 (75)	
Two	70.8	29.2	0.0	100 (144)	
Three and above	68.3	31.5	0.2	100 (850)	
Religion					**0.93**
Catholic	66.8	33.2	0.0	100 (184)	
Protestant	68.3	31.4	0.2	100 (837)	
Others	71.7	28.3	0.0	100 (46)	
Socio - economic characteristics					
Education attainment					**0.091 +**
No formal education	59.6	39.4	0.1	100 (99)	
Primary education	68.5	31.4	0.1	100 (682)	
Secondary and above	70.8	29.2	0.0	100 (288)	
Occupation					**0.488**
Not working	62.5	37.5	0.0	100 (16)	
Working in agriculture sectors	67.1	32.7	0.1	100 (776)	
Working in non agriculture sectors	72.4	27.2	0.2	100 (1064)	
Other characteristics					
Mass media exposure					**0.869**
Low	66.6	33.2	0.2	100 (455)	
Moderate	69.2	30.6	0.2	100 (565)	
High	72.3	27.7	0.0	100 (47)	
Men's attitudes towards pregnancy and childbirth					*****0.000**
Negative attitudes	71.5	28.4	0.1	100 (849)	
Positive attitudes	55.9	43.6	0.5	100 (220)	
Men's involvement during pregnancy and childbirth					****0.011**
Not involved	68.8	32.1	0.0	100 (849)	
Involved	66.2	32.8	1.0	100 (849)	

Note: +p<0.10, * =p<0.05 , ** =p<0.01 and ***=p<0.001

Table 4.6 is an overall cross tabulation of women's and couple characteristics against delays in Zambia. From table 4.6, it can be observed that wives or partners who work in agriculture sectors delay less in making a decision to seek care when experiencing obstetric complications. However, at the same time they also delay more in receiving adequate and appropriate care once the health facility has been reached as compared to those wives or partners who are not working and those working in non agriculture sectors respectively (p=0.007). Moreover, those wives or partners who are not working and those working in non agriculture sectors do not delay at all in receiving adequate and

appropriate care once the health facility has been reached. Thus, among women's and couple characteristics only women's occupation determines or predicts delays in Zambia. This entails that a wife or partner working in agriculture sectors in Zambia on one hand delays less in making a decision to seek care in case of obstetric complications, while on the other hand delays more in receiving adequate and appropriate care once she has reached the health facility.

Table 4.6 - Cross tabulations of women's and couple characteristics against delays

Selected independent variables	Delays				
	Delay one (%)	Delay two (%)	Delay three (%)	Total % (N)	Chi - square test
					Asymp. Sig.(2 - sided)
Women's characteristics					
Women's age					**0.730**
15 - 24	67.6	32.1	0.3	100 (318)	
25 - 39	67.7	32.1	0.2	100 (648)	
40+	73.8	26.2	0.0	100 (103)	
Women's education attainment					**0.458**
No formal education	66.5	33.0	0.5	100 (203)	
Primary education	67.8	32.1	0.1	100 (735)	
Secondary and above	74.0	26.0	0.0	100 (131)	
Women's occupation					****0.007**
Not working	73.6	26.4	0.0	100 (406)	
Working in agriculture sectors	63.2	36.5	0.4	100 (524)	
Working in non agriculture sectors	71.7	28.3	0.0	100 (138)	
Women's autonomy					**0.858**
Disempowered	68.4	31.5	0.2	100 (648)	
Equal responsibilities	68.5	31.3	0.3	100 (355)	
Empowered	61.0	39.0	0.0	100 (41)	
Intentionality of last birth					**0.271**
Intended	68.1	31.9	0.0	100 (587)	
Mistimed	81.1	18.9	0.7	100 (298)	
Unwanted	85.5	14.5	0.0	100 (148)	
Couple characteristics					
Wealth index					**0.553**
Poor	66.7	33.0	0.3	100 (646)	
Moderate	70.3	29.7	0.0	100 (273)	
Rich	71.3	28.7	0.0	100 (150)	

Note: +p<0.10, * =p<0.05, ** =p<0.01 and ***=p<0.001

4.2.3 Determinants of pregnancy complications

Male characteristics

Table 4.7 is largely a cross tabulation of men's socio – economic as well as demographic variables including delays and men's involvement during pregnancy and childbirth against pregnancy complications. Determinants that increase pregnancy complications include type of place of residence (urban at p=0.001), number of children (three children or more at p=0.034), education (secondary and above at P=0.082), men's occupation (not working at p=0.000) including mass media exposure (high at p=0.000). Furthermore, it can be observed that the association between delays and pregnancy complications sluggishly increase from a delay in making decision to seek care to a delay in reaching an appropriate obstetric facility once the decision to seek care has been made and sharply decreases to zero in a delay in receiving adequate and appropriate care once the facility has been reached. Surprisingly, men's involvement during pregnancy and childbirth (p=0.924) as well as delays (p=0.955) do not influence pregnancy complication.

Table 4.7 - Cross tabulations of all selected independent variables against pregnancy complications

Selected independent variables	Pregnancy complications			
	No complications (%)	Complications present (%)	Total % (N)	Chi - square test
				Asymp. Sig.(2 - sided)
Demographic characteristics				
Men's age				**0.925**
15 - 24	95.5	4.5	100 (176)	
25 - 39	83.4	16.6	100 (1664)	
40+	80.5	19.1	100 (666)	
Type of place of residence				*****0.001**
Urban	95.8	4.2	100 (1702)	
Rural	92.8	7.2	100 (804)	
Marital status				**0.460**
Married	94.8	5.2	100 (2496)	
Living together	100.0	0.0	100 (10)	
Number of children				***0.034**
One	91.9	8.1	100 (246)	
Two	93.8	6.2	100 (369)	
Three and above	95.5	4.5	100 (1891)	
Religion				**0.536**
Catholic	94.2	5.8	100 (500)	
Protestant	95.1	4.9	100 (1915)	
Others	93.0	7.0	100 (86)	
Socio - economic characteristics				
Education attainment				**0.082 +**
No formal education	96.2	3.8	100 (160)	
Primary education	95.6	4.4	100 (1317)	
Secondary and above	93.7	6.3	100 (1029)	
Occupation				*****0.000**
Not working	91.9	8.1	100 (37)	
Working in agriculture sectors	96.6	3.4	100 (1345)	
Working in non agriculture sectors	92.8	7.2	100 (1102)	
Other characteristics				
Mass media exposure				*****0.000**
Low	96.1	3.9	100 (765)	
Moderate	95.8	4.2	100 (1318)	
High	89.9	10.1	100 (417)	
Men's attitudes towards pregnancy and childbirth				**0.969**
Negative attitudes	94.8	5.2	100 (2095)	
Positive attitudes	94.9	5.1	100 (411)	
Men's involvement during pregnancy and childbirth				**0.924**
Not involved	94.9	5.1	100 (2067)	
Involved	94.8	5.2	100 (439)	
Three delays				
Delay one	97.5	2.5	100 (730)	**0.955**
Delay two	97.3	2.7	100 (337)	
Delay three	100	0.0	100 (2)	

Note: +p<0.10, * =p<0.05 , ** =p<0.01 and ***=p<0.001

Female characteristics

Table 4.8 is an overall cross tabulation of women's and couple characteristics against pregnancy complications in Zambia. From table 4.8, it can be observed that wives or partners with no formal education also experience less pregnancy complications compared to those with primary and secondary and above education (p=0.005).Moreover, women who work in agriculture sectors experience less pregnancy complications as compared to those who do not work and those working in non agriculture sectors (p=0.000). In addition, pregnancy complications increase with increase in couple's wealth index (0.000).Thus, women's education attainment, women's occupation and couples wealth index determine or predict pregnancy complications in Zambia.

Table 4.8 - Cross tabulations of women's and couple characteristics against pregnancy complications

Selected independent variables	Pregnancy complications			
	No complications (%)	Complications present (%)	Total % (N)	Chi - square test
				Asymp. Sig.(2 - sided)
Women's characteristics				
Women's age				**0.865**
15 - 24	95.2	4.8	100 (712)	
25 - 39	94.7	5.3	100 (1562)	
40+	94.8	5.2	100 (232)	
Women's education attainment				****0.005**
No formal education	96.1	3.9	100 (331)	
Primary education	95.6	4.4	100 (1578)	
Secondary and above	92.3	7.7	100 (597)	
Women's occupation				*****0.000**
Not working	95.2	4.8	100 (1027)	
Working in agriculture sectors	97.0	3.0	100 (901)	
Working in non agriculture sectors	90.8	9.2	100 (577)	
Women's autonomy				**0.746**
Disempowered	95.1	4.9	100 (1354)	
Equal responsibilities	94.5	5.5	100 (954)	
Empowered	94.0	6.0	100 (151)	
Intentionality of last birth				**0.556**
Intended	94.2	5.8	100 (1330)	
Mistimed	95.3	4.7	100 (639)	
Unwanted	95.1	4.9	100 (365)	
Couple characteristics				
Wealth index				*****0.000**
Poor	96.5	3.5	100 (1084)	
Moderate	95.6	4.4	100 (545)	
Rich	92.4	7.6	100 (877)	

Note: +p= <0.10, * =p<0.05 , ** =p<0.01 and ***=p<0.001

4.2.4 Determinants of neonatal deaths

Male characteristics

Table 4.9 is a cross tabulation of men's socio – economic as well as demographic variables including delays and men's involvement during pregnancy and childbirth against neonatal deaths in Zambia. From the table, it can be observed that neonatal deaths increase with increase in men's age (p=0.000). Further, it can be seen that neonatal deaths increase from urban to rural (p=0.001). Additionally, neonatal deaths increase with increase in the number of children (p=0.000). Moreover, neonatal deaths reduces with increase in men's education attainment (p=0.001) and also reduces with increase in mass media exposure (P=0.058). Furthermore, men who work in non agriculture sectors experience few neonatal deaths compared to those who do not work and those working in agriculture sectors (p=0.002).In addition, men with positive attitudes towards pregnancy and childbirth experience more neonatal deaths as compared to those with negative attitudes (p=0.079).Hence, in summary men's age, type of place of residence, number of children, education attainment, occupation, mass media exposure and men's attitudes towards pregnancy and childbirth determine or predict neonatal deaths.

Table 4.9 - Cross tabulations of all selected independent variables against neonatal deaths

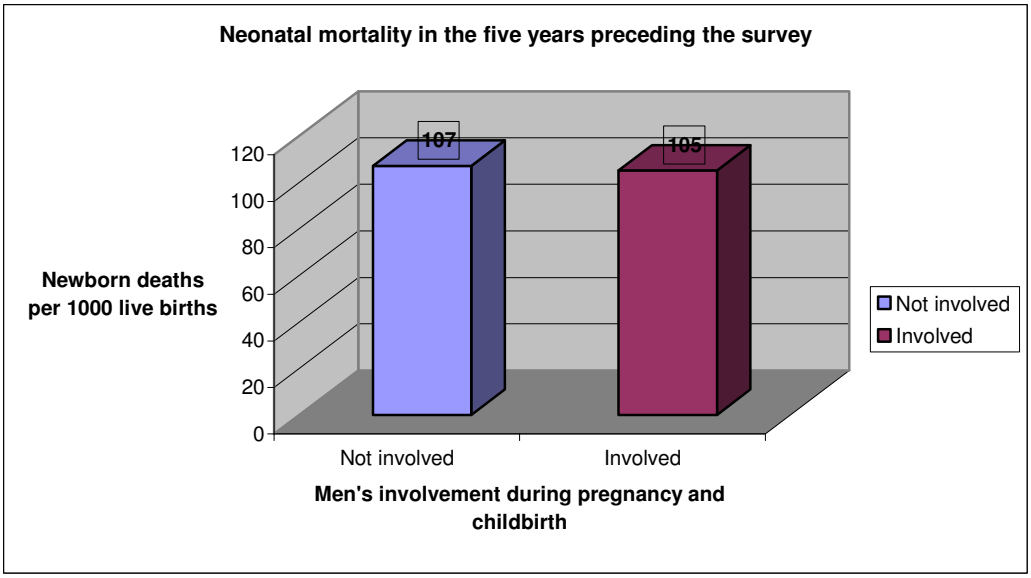
Selected independent variables	Neonatal deaths			
	No deaths (%)	Deaths (%)	Total % (N)	Chi - square test
				Asymp. Sig.(2 - sided)
Demographic characteristics				
Men's age				***0.000
15 - 24	93.2	6.8	100 (176)	
25 - 39	91.0	9.0	100 (1664)	
40+	84.1	15.9	100 (666)	
Type of place of residence				***0.001
Urban	92.4	7.6	100 (804)	
Rural	87.8	12.2	100 (1702)	
Marital status				0.273
Married	89.3	10.7	100 (2496)	
Living together	100.0	0.0	100 (10)	
Number of children				***0.000
One	97.6	2.4	100 (246)	
Two	94	6.0	100 (369)	
Three and above	87.3	12.7	100 (1891)	
Religion				0.587
Catholic	89.6	10.4	100 (500)	
Protestant	89.5	10.5	100 (1915)	
Others	86.0	14.0	100 (86)	
Socio - economic characteristics				
Education attainment				***0.001
No formal education	83.8	16.2	100 (160)	
Primary education	88	12.0	100 (1317)	
Secondary and above	91.8	8.2	100 (1029)	
Occupation				**0.002
Not working	86.5	13.5	100 (37)	
Working in agriculture sectors	87.4	12.3	100 (1345)	
Working in non agriculture sectors	91.7	8.3	100 (1102)	
Other characteristics				
Mass media exposure				0.058 +
Low	88.4	11.6	100 (765)	
Moderate	89.1	10.9	100 (1318)	
High	91.6	8.4	100 (417)	
Men's attitudes towards pregnancy and childbirth				0.079 +
Negative attitudes	89.8	10.2	100 (2095)	
Positive attitudes	86.9	13.1	100 (411)	
Men's involvement during pregnancy and childbirth				0.872
Not involved	89.3	10.7	100 (2067)	
Involved	89.5	10.5	100 (439)	
Three delays				
Delay one	87	13.0	100 (730)	0.559
Delay two	89	11.0	100 (337)	
Delay three	100	0.0	100 (2)	
Pregnancy complication				
No complications	89.5	10.5	100 (2377)	0.128
Complications present	85.3	14.7	100 (129)	

Note: +p= <0.10, * =p<0.05 , ** =p<0.01 and ***=p<0.001

Moreover, from table 4.9, it can also be observed that men's involvement during pregnancy and childbirth (p=0.872), delays (p=0.559) including pregnancy complications (p=0.128) do not influence neonatal deaths. Similarly, as shown in figure 4.2a below, when we compute neonatal mortality rates at the macro level for both not involved and involved there is no difference in neonatal deaths

between involved and non – involved men. Neonatal mortality rate in the five years preceding the survey for those men involved during pregnancy and childbirth in Zambia was 105 per 1000 deaths compared to 107 per 1000 deaths for those not involved. This entails that men's involvement assures a survival of two newborns compared to those not involved.

Figure 4.2a - Neonatal mortality rate in the 5 years preceding the survey in 2007 in Zambia based on the sample size of 2506



Female characteristics

Table 4.10 is an overall cross tabulation of women's and couple characteristics against neonatal deaths in Zambia. From table 4.10, it can be observed that neonatal deaths increase with increase in women's age (p=0.000) and on the other hand reduces with increase in women's education attainment (p=0.000). Moreover, women who had unwanted births experience more neonatal deaths compared to those with intended and mistimed births (p=0.040). Additionally, women from poor socio-economic backgrounds experience more neonatal deaths as compared to those from moderate and rich socio-economic backgrounds (p=0-058).In addition, pregnancy complications increase with increase in couple's wealth index (0.000).Thus, this implies that a woman aged 40 years and above living under poor socio – economic conditions with no or just primary education and happens to have unwanted last birth is more likely to experience neonatal deaths in Zambia.

Table 4.10 - Cross tabulations of women's and couple characteristics against neonatal deaths

Selected independent variables	Neonatal deaths			
	No deaths (%)	Deaths (%)	Total % (N)	Chi - square test
				Asymp. Sig.(2 - sided)
Women's characteristics				
Women's age				***0.000
15 - 24	94.1	5.9	100 (712)	
25 - 39	88.3	11.7	100 (1562)	
40+	81.5	18.5	100 (232)	
Women's education attainment				***0.000
No formal education	87.6	12.4	100 (331)	
Primary education	87.4	12.6	100 (1578)	
Secondary and above	95.3	4.7	100 (597)	
Women's occupation				0.408
Not working	90.2	9.8	100 (1027)	
Working in agriculture sectors	89.1	10.9	100 (901)	
Working in non agriculture sectors	88.0	12.0	100 (577)	
Women's autonomy				0.746
Disempowered	95.1	4.9	100 (1354)	
Equal responsibilities	94.5	5.5	100 (954)	
Empowered	94.0	6.0	100 (151)	
Intentionality of last birth				*0.040
Intended	89.2	10.8	100 (1330)	
Mistimed	90.9	9.1	100 (639)	
Unwanted	85.8	14.2	100 (365)	
Couple characteristics				
Wealth index				0.058 +
Poor	88.0	12.0	100 (1084)	
Moderate	91.0	9.0	100 (545)	
Rich	90.7	9.3	100 (877)	

Note: +p= <0.10, * =p<0.05 , ** =p<0.01 and ***=p<0.001

4.3 Binary logistic regression models

Determinants of men's involvement during pregnancy and childbirth

Firstly, we will exclusively look at models with only one independent variable (bivariate). Further, we will proceed to include all the independent variables that showed significance from the cross-tabulations' association in one model (multivariate).

4.3.1 Men's socio – economic and demographic characteristics by individual models (bivariate)

Table 4.11 shows the odds ratios from logistic regression models of men's involvement during pregnancy and childbirth by selected men's characteristics. Type of residence (rural), religion (others), and occupation (working in non agriculture sectors) are significantly associated with men's involvement during pregnancy and childbirth in Zambia. For instance, in terms of residence, men living in rural areas are 1.50 times more likely to be involved during pregnancy and childbirth. On the contrary, religion is negatively significantly associated with men's involvement during pregnancy and childbirth. For example, men other than Catholics are 0.35 times less likely to be involved during pregnancy and childbirth. As in religion, there is a negative significant association between occupation and men's involvement during pregnancy and childbirth. Men working in non agriculture sectors are about 0.5 times less likely to be involved during pregnancy and childbirth than men who are not working.

Table 4.11 - Odds ratios from logistic regression models of men's involvement during pregnancy and childbirth in Zambia by selected men's characteristics

Selected independent variables		
	Odds ratio (OR)	**P - Value**
Type of place of residence		****0.002**
Urban (r)	1	
Rural	1.50	****0.002**
Religion		***0.042**
Catholic (r)	1	
Protestant	1.03	**0.829**
Others	0.35	***0.017**
Occupation		***0.026**
Not working (r)	1	
Working in agriculture sectors	0.63	**0.218**
Working in non agriculture sectors	0.49	**0.062 +**

Note: results are expressed as odds ratios, which are exponetiated coefficients from the binary logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

4.3.2 Women's and couple characteristics and men's involvement by individual models (bivariate)

Table 4.12 illustrates the odds ratios from logistic regression models of men's involvement during pregnancy and childbirth by selected women's and couples characteristics. Women's occupation (working in agriculture sectors) and wealth index (moderate and rich) are significantly associated with men's involvement during pregnancy and childbirth in Zambia. For example, men whose wives are working in agriculture sectors are 2.03 times more likely to be involved during pregnancy and childbirth than those whose wives are not working. On the other hand, couples wealth index is negatively significantly associated with men's involvement during pregnancy and childbirth. For instance, men from moderate and rich socio – economic backgrounds other than poor socio – economic backgrounds are 0.69 and 0.61 times respectively, less likely to be involved during pregnancy and childbirth in Zambia.

Table 4.12 - Odds ratios from logistic regression models of men's involvement during pregnancy and childbirth in Zambia by selected women's and couples characteristics

Selected independent variables	**Odds ratio (OR)**	**P - Value**
Women's occupation		*****0.000**
Not working (r)	1	
Working in agriculture sectors	2.03	*****0.000**
Working in non agriculture sectors	1.07	**0.636**
Couples wealth index		*****0.000**
Poor (r)	1	
Moderate	0.69	****0.007**
Rich	0.61	*****0.000**

Note: results are expressed as odds ratios, which are exponetiated coefficients from the binary logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

4. 4 Multivariate logistic regression

4.4.1 Men's socio – economic and demographic characteristics by combined model (multivariate)

Table 4.13 shows the odds ratios from logistic regression models of men's involvement during pregnancy and childbirth by selected men's characteristics combined. When we fit all selected men's characteristics (type of place of residence, religion and occupation) into one model of men's involvement during pregnancy and childbirth in Zambia, occupation becomes insignificant. Furthermore, using the Nagelkerke's R2 ,we get 1.5 percent as the observed variability in men's involvement during pregnancy and childbirth explained by the above three independent variables. Using Nagelkerke's R2 , the variation explained by the three variables is very low, although, not as bad as when type of place residence (0.7 percent), religion (0.6 percent) or occupation (0.5 percent) is used alone. In summary, it can be observed that the model improves by slightly less than 1 percent by including type of place of residence, religion and occupation in one model. Furthermore, based on the odds ratios, it can be observed that rural men are 1.43 times more likely to be involved during

pregnancy and childbirth as compared to urban men. In addition, men from other religions (Muslims, Hindus etc) are 0.35 times less likely to be involved during pregnancy and childbirth as compared to Catholic men.

Table 4.13 - Odds ratios from logistic regression models of men's involvement during pregnancy and childbirth in Zambia by selected men's characteristics combined

Selected independent variables	Odds ratio (OR)	P - Value
Type of place of residence		***0.016**
Urban (r)	1	
Rural	1.43	***0.016**
Religion		***0.033**
Catholic (r)	1	
Protestant	1.04	**0.760**
Others	0.35	***0.015**
Occupation		**0.270**
Not working (r)	1	
Working in agriculture sectors	0.57	**0.136**
Working in non agriculture sectors	0.54	**0.293**

Note: results are expressed as odds ratios, which are exponetiated coefficients from the multivariate logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

4.4.2 Women's and couple characteristics and men's involvement by combined model (multivariate)

Table 4.14 shows the odds ratios from logistic regression models of men's involvement during pregnancy and childbirth by selected women's and couples characteristics combined.When we also fit selected women's and couples characteristics (women's occupation and couples wealth index) into another separate model of men's involvement during pregnancy and childbirth in Zambia, couples wealth index becomes very insignificant. Moreover, using ***Nagelkerke's*** R^2 , we get the observed variability of 2.9 percent in men's involvement during pregnancy and childbirth explained by the above two independent variables. The proportion of variation explained by the two variables is also still low, although, not as low as when couples wealth index (1.2 percent) is used alone. Furthermore, although the model improves just by 0.2 percent when compared to women's occupation (2.7 percent).It can also be observed that the model consisting of women's and couples characteristics explains more of the variation in men's involvement as compared to the model consisting of men's characteristics. In fact, even women's occupation alone explains more than the model consisting of the three men's characteristics and even more surprising is that it just explains 0.2 percent more than couple's wealth index alone. Furthermore, based on the odds ratios, it can be observed that men whose wives or partners work in agriculture sectors are 1.89 times more likely to be involved during pregnancy and childbirth as compared to those men whose wives or partners do not work.

Table 4.14 - Odds ratios from logistic regression models of men's involvement during pregnancy and childbirth in Zambia by selected women's and couples characteristics combined

Selected independent variables	Odds ratio (OR)	P - Value
Women's occupation		***0.000
Not working (r)	1	
Working in agriculture sectors	1.89	***0.000
Working in non agriculture sectors	1.11	**0.513**
Couples wealth index		**0.159**
Poor (r)	1	
Moderate	0.78	**0.077 +**
Rich	0.83	**0.181**

Note: results are expressed as odds ratios, which are exponetiated coefficients from the multivariate logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

4.4.3 All determinants of men's involvement in one single model

Table 4.15 shows the odds ratios from the multivariate logistic regression models of men's involvement during pregnancy and childbirth by all the selected five independent variables (type of place of residence, religion, men's occupation, women's occupation and couples wealth index). When we fit the five independent variables into one model, type of place of residence and couples wealth index become very insignificant. Likewise, based on ***Nagelkerke's*** R^2, the observed variability in men's involvement during pregnancy and childbirth explained by the model increases to 3.8 percent. This proportion of variation explained by all the five independent variables remains still low. It can be observed that there is a slight notable increase from as low as 1.5 per (model of men's characteristics) to 2.9 percent (model of women's and couples characteristics) and finally to 3.8 percent (model of all selected independent variables).Consequently, there is only a small difference of 0.9 percent in proportion of explanations between model of all the five selected independent variables and model of women's and couple characteristics. In summary, the final model explaining variations in men's involvement during pregnancy and childbirth consists of religion (Catholics and others), men's occupation (not working and working in agriculture sectors) and women's occupation (not working and working in agriculture sectors).

On the other hand, based on the odds ratios, it can be observed that men from other religions (Muslims, Hindus etc) are 0.34 times less likely to be involved during pregnancy and childbirth as compared to Catholic men. Additionally, men who work in non agriculture sectors are 0.54 less likely to be involved as compared to those men who do not work. Furthermore, men whose wives or partners work in agriculture sectors are 1.95 times more likely to be involved during pregnancy and childbirth as compared to those men whose wives or partners do not work. Therefore, unemployed Catholic man whose wife or partner works in agriculture sectors is more involved during pregnancy and childbirth in Zambia.

Table 4.15 - Odds ratios from logistic regression models of men's involvement during pregnancy and childbirth in Zambia by all selected characteristics combined

Selected independent variables	Odds ratio (OR)	P - Value
Type of place of residence		**0.906**
Urban (r)	1	
Rural	1.02	**0.906**
Religion		***0.046**
Catholic (r)	1	
Protestant	0.99	**0.943**
Others	0.34	***0.015**
Men's occupation		**0.097 +**
Not working (r)	1	
Working in agriculture sectors	0.46	***0.044**
Working in non agriculture sectors	0.54	**0.115**
Women's occupation		****0.000**
Not working (r)	1	
Working in agriculture sectors	1.95	****0.000**
Working in non agriculture sectors	1.10	**0.526**
Couples wealth index		**0.114**
Poor (r)	1	
Moderate	0.78	***0.048**
Rich	0.83	**0.157**

Note: results are expressed as odds ratios, which are exponetiated coefficients from the multivariate logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

4.5 Interactions of selected determinants of men's involvement in Zambia

Figure 4.3 was created from the odds ratios given in the spss output (the expB values). The total odds ratios are obtained my multiplying each underlying odds ratio for type of place of residence, religion and the interaction. Furthermore, it can be noted that the numbers and graphs show the differences in the odds ratios between the categories. For instance, figure 4.3 shows that the odds (rural versus catholic) being involved during pregnancy and childbirth for men from rural areas decreases from rural catholic to rural protestant and to rural other (Muslims, Hindus etc). On the contrary, the odds (urban versus catholic) of being involved during pregnancy and childbirth for urban men increases from urban catholic to urban protestant and then to urban other (Muslims, Hindus etc). Furthermore, based on the Wald test parameter for type of place of residence versus religion (p=0.099) the interaction effect on men's involvement during pregnancy and childbirth in Zambia is significant. Specifically, the interaction effect of rural versus others (Muslims, Hindu etc) is significant (p=0.032).This implies that a rural man who happens to be from other religion (Muslims, Hindus etc) is likely to be involved during pregnancy and childbirth in Zambia.

Figure 4.3 interaction between place of residence and religion on men's involvement during pregnancy and childbirth in Zambia

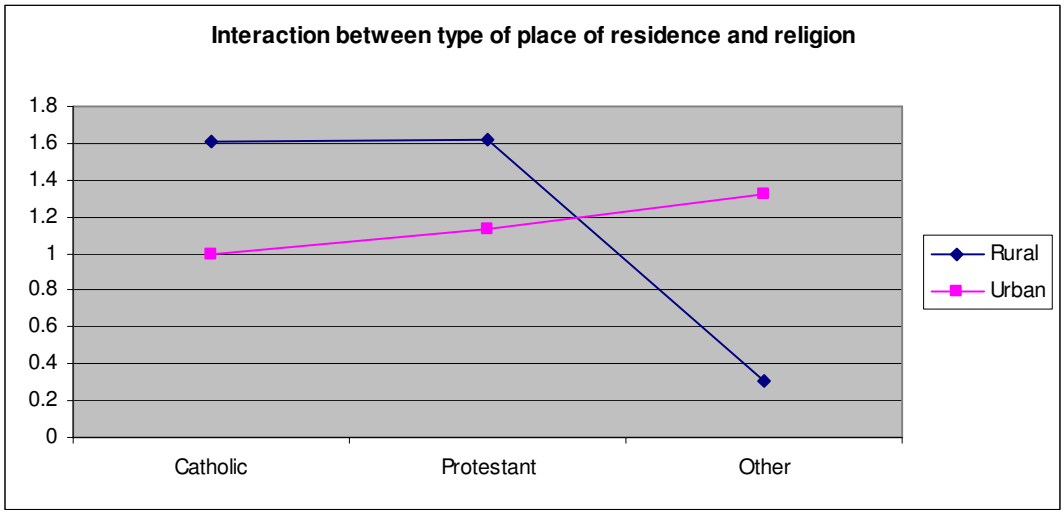
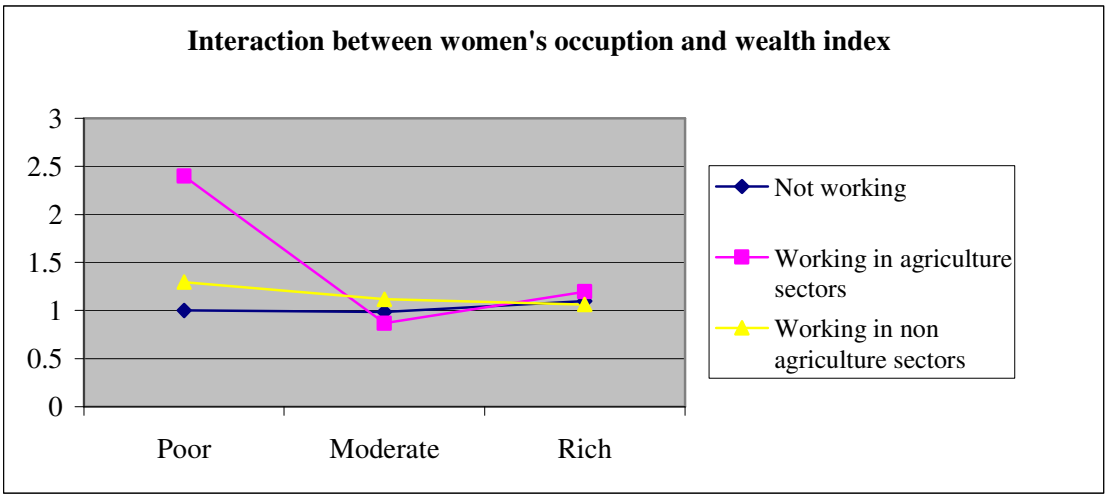


Figure 4.4 was also created from the odds ratios given in the spss output (the expB values). Additionally, the total odds ratios are obtained my multiplying each underlying odds ratio for wealth index, women's occupation and the interaction. Moreover, it can be noted that the numbers and graphs show the differences in the odds ratios between the categories. For instance, figure 4.4 shows that the odds (poor versus not working) of being involved during pregnancy and childbirth for men not working decreases slightly from poor to moderate socio – economic backgrounds (but almost on the same level) and then slightly increases with being from rich socio – economic backgrounds. In addition, the odds (poor versus working in agriculture sectors) of being involved during pregnancy and childbirth for men working in agriculture sectors decreases sharply from poor to moderate socio – economic backgrounds and then also increases with being from rich socio – economic backgrounds. In the same vein, the odds (poor versus working in non agriculture sectors) of being involved during pregnancy and childbirth for men working in non agriculture decreases from poor to moderate socio – economic backgrounds and further decreases with being from rich background.
Furthermore, based on the Wald test parameter for women's occupation versus wealth index (p=0.329) the interaction effect on men's involvement during pregnancy and childbirth in Zambia is not significant. Therefore, it suffices to say that the interaction between women's occupation and wealth index has no effect on men's involvement during pregnancy and childbirth in Zambia.

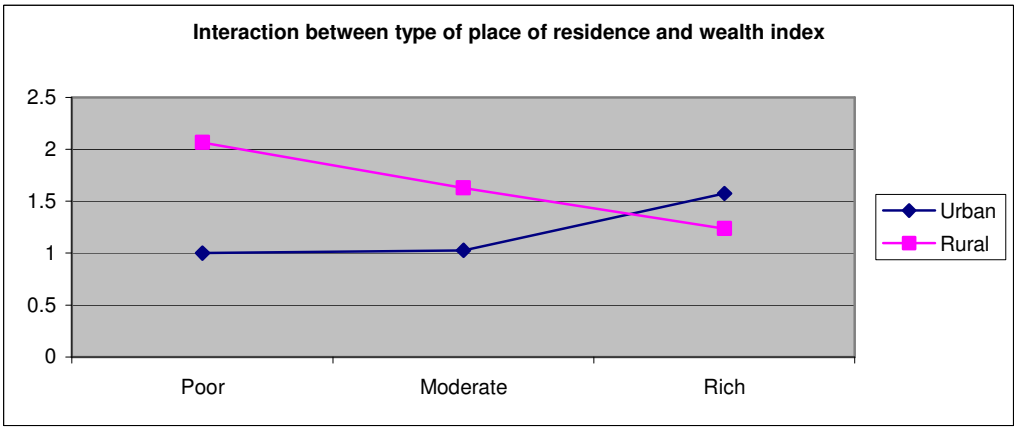
Figure 4.4 interaction between women's occupation and wealth index on men's involvement during pregnancy and childbirth in Zambia



Furthermore, figure 4.5 shows that the odds (rural versus poor) of being involved during pregnancy and childbirth for rural men decreases sharply from poor to rich. On the contrary, the odds (urban versus moderate) of being involved during pregnancy and childbirth for urban men increases sharply from moderate social economic backgrounds to rich. Whereas, the odds (urban versus poor) of being involved during pregnancy and childbirth for urban men is almost the same from poor to moderate socio – economic backgrounds.

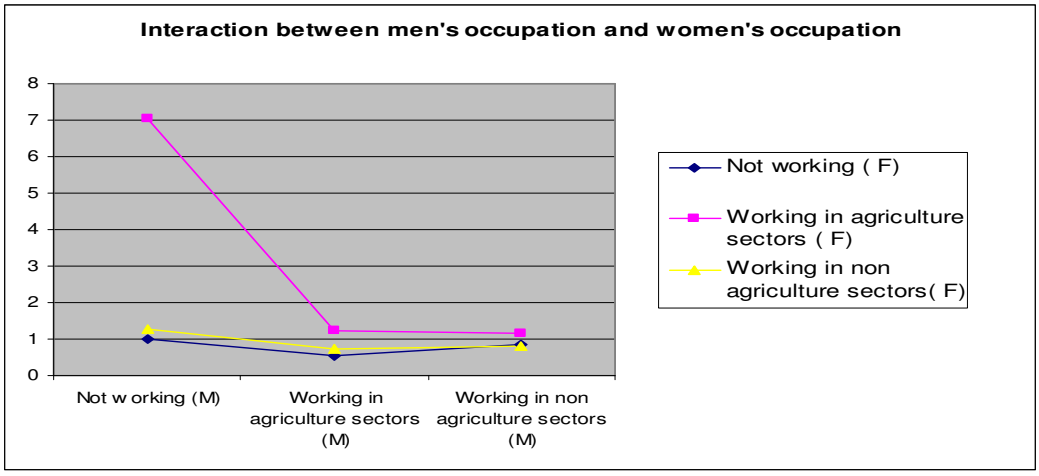
Moreover, based on the Wald test parameter for type of residence versus wealth index (p=0.220) the interaction effect on men's involvement during pregnancy and childbirth in Zambia is equally not significant. Consequently, it suffices to say that the interaction between type of place of residence and wealth index has no effect on men's involvement during pregnancy and childbirth in Zambia.

Figure 4.5 interaction between type of place involvement during pregnancy and childbirth in Zambia of residence and wealth index on men's



Moreover, figure 4.6 was also created from the odds ratios given in the spss output (the expB values). Additionally, the total odds ratios are obtained my multiplying each underlying odds ratio for men's occupation, women's occupation and the interaction. It can be observed that the odds (not working for women versus not working for men) of being involved during pregnancy and childbirth for men whose wives or partners do not work decreases sharply from not working to working in agriculture sectors and further slightly decreases with working in non agriculture sectors. In addition, the odds (working in non agriculture sectors for women versus working in non agriculture sectors for men) of being involved during pregnancy and childbirth for men whose wives or partners work in non agriculture sectors increases slightly from working in non agriculture sectors to working in agriculture sectors and further increases with not working .
Furthermore, based on the Wald test parameter for men's occupation versus women's occupation (p=0.314) the interaction effect on men's involvement during pregnancy and childbirth in Zambia is not significant. As a result, it suffices to say that the interaction between men's occupation and women's occupation has no effect on men's involvement during pregnancy and childbirth in Zambia.

Figure 4.6 interaction between men's occupation and women's occupation on men's during pregnancy and childbirth in Zambia



4.6 Delays

4.6 .1 Multinomial logistic regression

We will run the multinomial logistic regression models of delays by including variables (men's education attainment, women's occupation, men's attitudes towards pregnancy and childbirth as well as men's involvement during pregnancy and childbirth) that were significant from the bivariate analysis (Cross – tabulations) as shown in table 4.5.Multinomial logistic regression is used when the dependent variable is categorical and has more than two categories (Polytomous).For example, delays which is the dependent variable has three categories or responses that is delay one, delay two and delay three. Multinomial logistic regression in this case is appropriate to determine what factors predict which delays men and their wives or partners face when their wives or partners are

experiencing an obstetric complication.

The model fitting information tells you that including the explanatory variables in the final model, improves the fit of the model relative to using only the intercept. Therefore, based on the model fitting information , we can observe that men's education attainment, women's occupation, men's attitudes towards pregnancy and childbirth including men's involvement during pregnancy and childbirth improve the fit of the model (p=0.000). Furthermore, the Likelihood Ratio Tests show how each of the explanatory variables contributes to improving the model fit relative to the intercept only. However, based on the Likelihood Ratio Tests, men's attitude towards pregnancy and childbirth (-2 log likelihood of reduced model is 158.888 at p= 0.000) contributes the most while women's occupation (-2 log likelihood of reduced model is 137.106 at p=0.214) contributes the least.

Table 4.19 below shows that the only coefficients (variables) with significant odds ratios are men's attitudes during pregnancy and childbirth (p=0.000) for delay two (delay in reaching an appropriate obstetric facility once the decision to seek care has been made) and men's education attainment (p=0.086) for delay three (delay in receiving adequate and appropriate care once the facility has been reached) .Men's attitudes towards pregnancy in delay two is 1.94 times likely as compared to men's attitudes towards pregnancy and childbirth from delay one (delay in making decision to seek care) which is the reference category. Furthermore, men's education attainment in delay three is 0.07 times less likely as from delay one. It can therefore, be concluded that men's attitudes towards pregnancy and childbirth is a very significant explanatory variable in the delay in reaching an appropriate obstetric facility once the decision to seek care has been made and, men's education attainment on the other hand is significant in the delay in receiving adequate and appropriate care once the health facility has been reached.Nonetheless, based on ***Nagelkerke's*** R^2, the explained variance of the final model is 4.4 percent which is reasonable and even quite good for multinomial logistic regression.

Table 4.16 - Odds ratios from multinomial logistic regression models of delays by selected variables

Delays			95 % Confidence Interval for Exp(B)	
	Odds ratio (OR)	**P - Value**	Lower bound	Upper bound
Delay two				
Intercept		**0.06 0 +**		
Men's education attainment	0.85	**0.158**	0.675	1.066
Women's occupation	1.18	**0.107**	0.966	1.429
Men's attitudes towards pregnancy and childbirth	1.94	***0.000**	1.423	2.633
Men's involvement during pregnancy and childbirth	1.11	**0.532**	0.796	1.555
Delay three				
Intercept		***0.000**		
Men's education attainment	0.07	**0.086 +**	0.003	1.466
Women's occupation	3.02	**0.468**	0.153	59.596
Men's attitudes towards pregnancy and childbirth	9.39	**0.148**	0.450	195.687
Men's involvement during pregnancy and childbirth	1.70	-	1.697	1.697

Note: results are expressed as odds ratios, which are exponetiated coefficients from the multinomial logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and reference category is delay one

4.7 Pregnancy complications

4.7.1 Binary regression models of pregnancy complications

We will exclusively look at models with only one independent variable (bivariate). Nevertheless, only independent variables that showed significance from the cross tabulations have been added in the models.

Table 4.17a shows the odds ratios from binary logistic regression models of pregnancy complication by selected independent variables. Type of residence (rural), number of children (three and above), women's education attainment (secondary and above), women's occupation (working in agriculture sectors and working in non agriculture sectors), mass media exposure(high) and wealth index (rich) are significantly associated with pregnancy complications in Zambia. For instance, in terms of education attainment, women with secondary or higher education are about 2.04 times more likely to experience pregnancy complications. As in education attainment, women working in non agriculture sectors are 2.02 times more likely to experience pregnancy complications. Furthermore, men with high mass media exposure are 2.74 times more likely to have their wives or partners experience pregnancy complications. Additionally, women from rich socio-economic background are 2.28 times more likely to experience pregnancy complications. Therefore, a Zambian woman from rich socio – economic background with secondary or higher education, working in non agriculture sectors and is either married or has a rural male partner with high mass media exposure and also with three or more children is likely to experience pregnancy complications .

Table 4.17a - Odds ratios from binary logistic regression models of pregnancy complication by selected variables

Selected independent variables	Odds ratio (OR)	P - Value
Demographic characteristics		
Type of place of residence		***0.001**
Urban (r)	1	
Rural	0.56	***0.001**
Number of children		*0.037
One (r)	1	
Two	0.751	**0.367**
Three and above	0.538	*0.016
Socio - economic characteristics		
Men's education attainment		**0.084 +**
No formal education (r)	1	
Primary education	1.182	**0.702**
Secondary and above	1.731	**0.208**
Women's education attainment		**0.006
No formal education (r)	1	
Primary education	1.135	**0.680**
Secondary and above	2.042	*0.027
Men's occupation		***0.000**
Not working (r)	1	
Working in agriculture sectors	0.401	**0.141**
Working in non agriculture sectors	0.875	**0.828**
Women's occupation		***0.000**
Not working (r)	1	
Working in agriculture sectors	0.617	*0.048
Working in non agriculture sectors	2.019	***0.001**
Couple characteristics		
Wealth index		***0.000**
Poor (r)	1	
Moderate	1.268	**0.372**
Rich	2.277	***0.000**
Other characteristics		
Mass media exposure		***0.000**
Low (r)	1	
Moderate	1.087	**0.717**
High	2.744	***0.000**

Note: results are expressed as odds ratios, which are exponetiated coefficients from the binary logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

Confounders

According to experiment resources (2010), a confounding variable, is also known as a third variable. The confounding variable can adversely after the relationship between the independent variable and dependent which might lead to erroneous analysis of the results considering it tends to have an association with both exposing and outcome variables.Therefore, in this particular study, the association between men's involvement during pregnancy and childbirth and pregnancy complications appears to be confounded by type of place of residence, men's occupation, women's occupation and wealth index.

4.7.2 Multivariate analysis including confounders

4.7.2.1 Association between men's involvement and pregnancy complications

From table 4.17b, it can be observed that Model 1 includes just men's involvement during pregnancy and childbirth. Furthermore, and based on the Omnibus Tests of Model coefficients, model 1 is very insignificant (p=0.881), including the Wald test parameter for men's involvement during pregnancy (p=0.881). From the table, it can be seen that the model based on ***Nagelkerke's*** R^2 (0.0 percent) explains nothing about the observed variability in pregnancy complications.

Model 2 includes men's involvement during pregnancy and childbirth and type of place of residence, which is a confounder variable in the relationship between men's involvement and pregnancy complications. When we add type of place of residence, and also based on the Omnibus Tests of Model coefficients, model 2 becomes significant (p=0.009), on the other hand, the Wald test parameter for men's involvement (p=0.723) improves but still remains insignificant. Nevertheless, based on ***Nagelkerke's*** $\boldsymbol{R^2}$, the explanation in the observed variability in pregnancy complications by model 2 improves to 1.1 percent.

Model 3 includes men's involvement during pregnancy and childbirth, type of place of residence, and men's occupation which is another confounder variable. As we add men's occupation and based on the Omnibus Tests of Model coefficients, model 3 remains significant (p=0.001), on the contrary, the Wald test parameter for men's involvement (p=0.726) still remains insignificant. Conversely, based on the ***Nagelkerke's*** R^2, the explanation in the observed variability by model 3 in pregnancy complications improves to 2.2 percent.

Model 4 includes men's involvement during pregnancy and childbirth, type of place of residence, men's occupation and women's occupation also another confounder variable. As we add women's occupation and further based on the Omnibus Tests of Model coefficients the model becomes very significant (p=0.000), equally, the Wald test parameters (p=0.572) improves but still remains insignificant. Nonetheless, based on ***Nagelkerke's*** R^2, the explanation in the observed variability in pregnancy complications by model 4 improves to 3.8 percent.

Model 5 includes men's involvement during pregnancy and childbirth, type of place of residence, men's occupation, women's occupation and wealth index as well another confounder variable. As we add wealth index, and in addition based on the Omnibus Tests of Model coefficients, model 5 remains very significant (p=0.000), on the other hand, the Wald test parameter for men's involvement (p=0.557) improves but still very insignificant. Conversely, based on ***Nagelkerke's*** R^2, the explanation in the observed variability in pregnancy complications by model 5 improves to 4.0

percent.

In summary, even after adjusting or controlling for confounder variables like type of place of residence, men's occupation, women's occupation and wealth index: the association between pregnancy complications and adjusted men's involvement during pregnancy and childbirth in Zambia is not significant as shown from the ***β, the OR and adjusted OR (95 % CI)*** in table 4.17b below.

Table 4.17b - Odds ratios from multivariate logistic regression models of pregnancy complication with confounders

Selected independent variables	β	Odds ratio (OR)	95% CI (OR)	P - Value	R Square Percent
Model 1					**0.0**
Men's involvement during pregnancy and childbirth	**0.035**			**0.881**	
Involved (r)		1			
Not involved		1.036	**0.652 - 1.647**	**0.881**	
Model 2					**1.1**
Men's involvement during pregnancy and childbirth	**0.084**			**0.723**	
Involved (r)		1			
Not involved		1.088	**0.683 - 1.733**	**0.723**	
Type of place of residence				****0.002**	
Urban (r)		1			
Rural		0.566		****0.002**	
Model 3					
Men's involvement during pregnancy and childbirth	**0.083**			**0.726**	**2.2**
Involved (r)		1			
Not involved		1.087	**0.681 - 1.734**	**0.726**	
Type of place of residence				**0.526**	
Urban (r)		1			
Rural		0.867		**0.526**	
Men's occupation				*****0.009**	
Not working (r)		1			
Working in agriculture sectors		0.424		**0.170**	
Working in non agriculture sectors		0.851		**0.794**	
Model 4					**3.8**
Men's involvement during pregnancy and childbirth	**0.136**		**0.715 - 1.834**	**0.572**	
Involved (r)		1			
Not involved		1.145		**0.572**	
Type of place of residence				**0.695**	
Urban (r)		1			
Rural		1.096		**0.695**	
Men's occupation				**0.065 +**	
Not working (r)		1			
Working in agriculture sectors		0.490		**0.258**	
Working in non agriculture sectors		0.840		**0.779**	
Women's occupation				*****0.001**	
Not working (r)		1			
Working in agriculture sectors		0.714		**0.199**	
Working in non agriculture sectors		1.832		****0.004**	
Model 5					
Men's involvement during pregnancy and childbirth	**0.141**		**0.719 - 1.845**	**0.557**	**4.0**
Involved (r)		1			
Not involved		1.152		**0.557**	
Type of place of residence				**0.282**	
Urban (r)		1			
Rural		1.35		**0.282**	
Men's occupation				**0.188**	
Not working (r)		1			
Working in agriculture sectors		0.508		**0.285**	
Working in non agriculture sectors		0.785		**0.697**	
Women's occupation				****0.002**	
Not working (r)		1			
Working in agriculture sectors		0.743		**0.265**	
Working in non agriculture sectors		1.808		****0.005**	
Wealth index				**0.41**	
Poor (r)		1			
Moderate		1.054		**0.852**	
Rich		1.496		**0.219**	

Note: results are expressed as odds ratios, which are exponetiated coefficients from the multivariate logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

4.8 Neonatal deaths

4.8.1 Binary regression models of Neonatal deaths

We will also exclusively look at models with only one independent variable (Bivariate). However, only independent variables that showed significance from the cross tabulations have been added in the models.

Table 4.18a shows the odds ratios from logistic regression models of neonatal deaths by selected independent variables.Men's age (15- 24 and 40+) , women's age (15-24, 25-39 and 40+), type of residence (rural), number of children (two and three and above) , men's education attainment (secondary and above), women's education attainment (secondary and above), men's attitudes towards pregnancy and childbirth (positive attitudes) and intentionality of last birth (unwanted) are significantly associated with neonatal deaths in Zambia. For instance, in terms of age, men aged 40 years or more are 2.59 times more likely to experience neonatal deaths in their families. Similarly, men with wives or partners who are aged 40 years or more are 3.63 times more likely to experience neonatal deaths. In terms of residence, men living in rural areas are 1.69 times more likely to experience neonatal deaths in their families. Moreover, men with three or more children are 5.82 times more likely to experience neonatal deaths in their families. Men with positive attitudes towards pregnancy and childbirth are 1.33 times more likely to experience neonatal deaths. Additionally, men with wives or partners who had unwanted last birth are 1.38 times more likely to experience neonatal deaths in their families. Hence, a Zambian rural man aged 40 years or more, with a wife or partner aged 40 years or more who had unwanted last birth and they have three or more children is highly likely to experience neonatal deaths in his family.

Table 4.18a - Odds ratios from binary logistic regression models of neonatal deaths by selected variables

Selected independent variables	Odds ratio (OR)	P - Value
Demographic characteristics		
Men's age		***0.000
15 - 24 (r)	1	
25 - 39	1.354	**0.330**
40+	2.587	**0.003
Women's age		***0.000
15 - 24 (r)	1	
25 - 39	2.117	***0.000
40+	3.629	***0.000
Type of place of residence		***0.001
Urban (r)	1	
Rural	1.690	***0.001
Number of children		***0.000
One (r)	1	
Two	2.536	*0.047
Three and above	5.815	***0.000
Socio - economic characteristics		
Men's education attainment		***0.001
No formal education (r)	1	
Primary education	0.703	**0.126**
Secondary and above	0.458	***0.001
Women's education attainment		***0.000
No formal education (r)	1	
Primary education	1.021	**0.911**
Secondary and above	0.348	***0.000
Men's occupation		**0.002
Not working (r)	1	
Working in agriculture sectors	0.926	**0.875**
Working in non agriculture sectors	0.576	**0.263**
Women's occupation		**0.409**
Not working (r)	1	
Working in agriculture sectors	1.119	**0.453**
Working in non agriculture sectors	1.249	**0.185**
Other characteristics		
Mass media exposure		**0.216**
Low (r)	1	
Moderate	1.087	**0.621**
High	2.744	**0.084 +**
Men's attitudes on pregnancy and childbirth		**0.080 +**
Negative attitudes (r)	1	
Positive attitudes	1.33	**0.080 +**
Intentionality of last birth		*0.041
Intended (r)	1	
Mistimed	0.829	**0.251**
Unwanted	1.379	**0.065 +**

Note: results are expressed as odds ratios, which are exponetiated coefficients from the binary logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

Confounders

Furthermore, also in this particular study, the association between men's involvement during pregnancy and childbirth and neonatal deaths appears to be confounded also by type of place of residence, men's occupation, and women's occupation.

4.8.2 Multivariate analysis including confounders

4.8.2.1 Association between men's involvement and neonatal deaths

From table 4.18b, it can be observed that Model 1 includes just men's involvement during pregnancy and childbirth. Moreover, based on the Omnibus Tests of Model coefficients, model 1 is very insignificant (p=0.933), including the Wald test parameter for men's involvement during pregnancy and childbirth (p=0.933). From the table, it can be seen that model 1 based on ***Nagelkerke's*** R^2 (0.0 percent) explains nothing about the observed variability in neonatal deaths.

Model 2 includes men's involvement during pregnancy and childbirth and type of place of residence, which is a confounder variable in the relationship between men's involvement and neonatal deaths. When we add type of place of residence, and based on the Omnibus Tests of Model coefficients, model 2 becomes significant (p=0.001), on the other hand, the Wald test parameter for men's involvement (p=0.754) improves but still remains insignificant. However, based on ***Nagelkerke's*** R^2, the explanation in the observed variability in neonatal deaths by model 2 improves to 1.2 percent.

Model 3 includes men's involvement during pregnancy and childbirth, type of place of residence, and men's occupation which is another confounder variable. As we add men's occupation, and further based on the Omnibus Tests of Model coefficients, the model remains significant (p=0.002), conversely, the Wald test parameter for men's involvement (p=0.729) improves but still remains insignificant. Nevertheless, based on ***Nagelkerke's*** R^2, the explanation in the observed variability in neonatal deaths by model 3 improves to 1.4 percent.

Model 4 includes men's involvement during pregnancy and childbirth, type of place of residence, men's occupation and women's occupation also another confounder variable. As we add women's occupation, and also based on the Omnibus Tests of Model coefficients, model 4 (p=0.000) becomes very significant, on the other hand, the Wald test parameter for men's involvement (p=0.870) becomes very insignificant. Nonetheless, based on ***Nagelkerke's*** R^2, the explanation in the observed variability in neonatal deaths by model 4 improves to 2.0 percent.

In summary, even after adjusting or controlling for confounder variables such as type of place of residence, men's occupation, and women's occupation: the association between neonatal deaths and adjusted men's involvement during pregnancy and childbirth in Zambia is not significant as shown from the ***β, the OR and adjusted OR (95 % CI)*** in table 4.18b below.

Table 4.18b - Odds ratios from multivariate logistic regression models of neonatal deaths with confounders

Selected independent variables	β	Odds ratio (OR)	95% CI (OR)	P - Value	R Square Percent
Model 1					**0.0**
Men's involvement during pregnancy and childbirth	**-0.014**			**0.933**	
Involved (r)		1			
Not involved		0.986	**0.704 - 1.379**	**0.933**	
Model 2					**1.2**
Men's involvement during pregnancy and childbirth	**-0.054**			**0.754**	
Involved (r)		1			
Not involved		0.947	**0.676 - 1.328**	**0.754**	
Type of place of residence				*****0.000**	
Urban (r)		1			
Rural		1.75		*****0.000**	
Model 3					
Men's involvement during pregnancy and childbirth	**-0.060**			**0.729**	**1.4**
Involved (r)		1			
Not involved		0.942	**0.672 - 1.321**	**0.729**	
Type of place of residence				***0.042**	
Urban (r)		1			
Rural		1.473		***0.042**	
Men's occupation				**0.243**	
Not working (r)		1			
Working in agriculture sectors		0.822		**0.691**	
Working in non agriculture sectors		0.631		**0.355**	
Model 4					**2.0**
Men's involvement during pregnancy and childbirth	**-0.028**		**0.691 - 1.367**	**0.870**	
Involved (r)		1			
Not involved		0.972		**0.870**	
Type of place of residence				****0.008**	
Urban (r)		1			
Rural		1.686		****0.008**	
Men's occupation				**0.110**	
Not working (r)		1			
Working in agriculture sectors		0.880		**0.795**	
Working in non agriculture sectors		0.621		**0.338**	
Women's occupation				**0.019**	
Not working (r)		1			
Working in agriculture sectors		0.874		**0.396**	
Working in non agriculture sectors		1.477		***0.025**	

Note: results are expressed as odds ratios, which are exponetiated coefficients from logistic regression
Also note: +p<0.10,*=p<0.05 , **=p<0.01, ***=p<0.001 and r=reference category

Chapter five

5.0 Discussion and conclusions

In this chapter, the findings of the study are presented and discussed. Furthermore, the weaknesses of working with DHS data are given and finally the conclusion and the implications of the study are presented.

5.1 Description of research questions and expectations

The main objective of this study was to examine and understand the involvement of men during pregnancy and childbirth and explore its influence on delays, pregnancy complications and neonatal deaths in Zambia. In order to achieve the above objective, it answers the following main research questions: What is men's involvement during pregnancy and childbirth in Zambia? What are the determinants or predictors of men's involvement during pregnancy and childbirth in Zambia? What is the role of men's involvement during pregnancy and childbirth on delays, pregnancy complications and neonatal mortality in Zambia? What is the role of delays on pregnancy complications and neonatal mortality in Zambia?

From the study, it was generally expected that men's involvement during pregnancy and childbirth in Zambia would be high. Moreover, it was also expected that women's characteristics (women's autonomy, occupation, age, intentionality of last birth, level of education); couple characteristics (wealth index); men's socio – economic characteristics (education level, occupation); men's demographic characteristics (age, type of place of residence, marital status, number of children and religion) and other characteristics such as mass media exposure and men's attitudes towards pregnancy and childbirth would predict or determine men's involvement during pregnancy and childbirth in Zambia. Furthermore, it was expected that the interactions between type of place of residence and religion; women's occupation and couple's wealth index; type of place of residence and couple's wealth index as well as men's occupation and women's occupation would also predict or determine men's involvement during pregnancy and childbirth in Zambia. Additionally, it was further expected that men's involvement during pregnancy and childbirth would influence pregnancy complications and neonatal deaths in Zambia. On the other hand, however, it was also anticipated that delays would increase pregnancy complications and neonatal deaths in Zambia. And further, in the theoretical framework, it was assumed that maternal or pregnancy complications/deaths go hand in hand with neonatal deaths and that most neonatal deaths branch from poor maternal health, insufficient care during pregnancy, and inapt management of complications during pregnancy and delivery. We therefore, anticipated that neonatal deaths would have a strong significant association with pregnancy complications.

5.2 Main Findings

5.2.1 Men's Involvement during pregnancy and childbirth

In patriarchal society, men are considered to be superior to women and most of all the decisions are made by them. Men not only influence wife's or partner's health outcomes but also other aspects of life. On the other hand, the social construction of masculinity also helps men to be more powerful

than their counterparts (Vikashi Kumar K.C and Sirjana Adhikari, 2009). In spite of the sensitization and awareness against traditional beliefs about gender roles and norms, the Zambian society is still facing low number of men taking responsibility for the health of their wives/partners and newborns. It is evident from this study that a large percentage of men (82.5 percent) are not involved during pregnancy and childbirth in Zambia. Only a handful (17.5 percent) of men is involved during pregnancy and childbirth in Zambia. The low involvement of men observed in maternal care in this study is lower than the level among men in South Africa (33.3 percent) but even lower than the level among men in Osun (93.9 percent) (Odimegwu, C. et al., 2005) and Oyo (72.5 percent) (Olayemi, O. et al. 2009) states in south west of Nigeria and India (98.2 percent).It is also not in agreement with the participation rate of men in Nepal (40 percent) (Vikashi Kumar KC and Sirjana Adhikari, 2009).Our findings are further in contrast with findings from El Salvador (90 percent) (Carter and Speiezer 2005). Differences between our findings and those of other countries maybe due to the different culture and level of gender sensitivity. And also differences in the data used and the way male involvement is measured.

From both bivariate (cross – tabulations) and binary logistic regression analyses, we found that type of place of residence was strongly associated with men's involvement during pregnancy and childbirth in Zambia. More men in rural areas are involved during pregnancy and childbirth in Zambia as compared to urban men. However, when we do multivariate logistic regression analysis of men's involvement during pregnancy and childbirth including type place of residence and other selected variables as shown in table 4.15 in chapter four, we find that type of place of residence is not significantly associated with men's involvement during pregnancy and childbirth in Zambia. More research is needed to more fully extriplicate these and other findings. Furthermore, from the same multivariate analyses involving men's involvement and religion including other selected variables, we found that religion is strongly associated with men's involvement during pregnancy and childbirth in Zambia. Men from other religion comprising of Muslims, Hindus and Traditionalists are less likely to be involved during pregnancy and childbirth as compared to Catholic men in Zambia.

From the same analysis, we also found that men's occupation is weakly significantly associated with men's involvement during pregnancy and childbirth. Men who are working in agriculture sectors are less likely to be involved during pregnancy and childbirth as compared to their counterparts who are not working. One possible reason may be that men working in agriculture sectors may have less free time or less flexible work schedules, to ascribe to norms about fatherhood that facilitate involvement in family health as compared to those not working. On the other hand, we found that women's occupation was strongly associated with men's involvement during pregnancy and childbirth in Zambia. Men with wives or partners working in agriculture sectors are more likely to be involved during pregnancy and childbirth in Zambia as compared to their counterparts with wives or partners who are not working.

Although mass media exposure is an important determinant that encourages and creates awareness towards wife's or partner's health among men, in this study we did not find any significant association between mass media exposure and men's involvement during pregnancy and childbirth in Zambia. This is in line with what Vikashi Kumar K .C and Sirjana Adhikari (2009) found in a study on husband's participation in pregnancy care in Nepal. However, further research is needed to draw a firm conclusion.

On the other hand, socio – economic condition (wealth index) appears as a strong predictor of men's involvement during pregnancy and childbirth as shown by binary logistic regression analysis in table 4.12 in chapter four. For example, men with poor economic condition are more likely to be involved during pregnancy and childbirth than their rich counterparts. However, when we do multivariate logistic regression analysis including men's involvement and wealth index as well as other selected

variables (type of place of residence, religion, men's occupation and women's occupation) wealth index becomes insignificant. Therefore, it suffices to say that wealth index does not predict or determine men's involvement during pregnancy and childbirth. However, more research is needed to more fully extriplicate these and other findings

Education attainment was also not found to be a significant predictor of men's involvement during pregnancy and childbirth in these analyses. This is contrary to what Carter and Speiezer (2005) found in their study of Salvadoran fathers' attendance at prenatal care, delivery, and postpartum care. They found that men with more than primary education were more likely than their less educated counterparts to participate in one or more of the birth related activities. Similarly, like a lot of other studies, Vikashi Kumar K .C and Sirjana Adhikari (2009) also found a positive association between husband's involvement and education. They argued that education makes men more responsible to their partner's health as well as well being of the familial life.

We did not find men's attitudes towards pregnancy and childbirth to be significantly associated with men's involvement during pregnancy and childbirth in Zambia. Nonetheless, our association of these attitudes was based on responses to only two questions and so does not reflect the subject's overall behaviour or other aspects of gender relations that could be associated with such involvement. These findings are in line with what Carter and Speiezer (2005) found in their study of Salvadoran fathers' attendance at prenatal care, delivery, and postpartum care. However, results of the qualitative research from rural Guatemala suggest that fathers who participate in birth related health care activities generally do so out of love and /or concern about the health of the mother and child. The same maybe true among the Zambian men in our study though additional research is needed to asses this.

Furthermore, in this study women's autonomy is not significantly associated with men's involvement during pregnancy and childbirth in Zambia. This is contrary to what Vikashi Kumar K .C and Sirjana Adhikari (2009) found including Mullany et al., (2005) in their study on *can women's autonomy impede male involvement in pregnancy health in Katmandu, Nepal*? Both studies and also others found that the odds of husband's involvement were likely to be lower among partners who have sole authority to decide alone. They stated that the likelihood of husband's involvement was likely to be higher among the couples who decide jointly. They argued that one of the possible explanations of this may be because of the reason that when couples decide jointly, they not only have better communication about antenatal checkups, birth preparedness but also other healthy practices, which ultimately encourage them for better utilization of pregnancy care. In this study, the measure of women's autonomy could be more representative if it included other aspects of partner's decision in their daily lives and also if we had weighted the responses or indices. This observation is among many others that just show how inadequate DHS data is.

In this study, only the interaction effect between type of place of residence and religion on men's involvement during pregnancy and childbirth in Zambia is significant; though the association is weak. We found that urban catholic men are more involved during pregnancy and childbirth in Zambia as compared to rural men who are either Muslims, Hindus or traditionalists. These findings are contrary to what we had hypothesized: our hypothesis being that urban men who happen to be Protestants were more likely to be involved during pregnancy and childbirth in Zambia.

5.2.2 Delays

Based on both univariate and bivariate analyses, we found that the majority of the men and their wives or partners delay in deciding to seek care when their wives or partners are experiencing an

obstetric complication. This delay may be influenced by various issues and actors involved in the decision-making process; illness characteristics (recognition of the complication, its perceived etiology, or severity); lack of trust on the health system or negative attitude towards care providers; perceived quality of care or distance to a medical facility (Thaddeus, and Maine, 1994).On the contrary, men and their partners almost never delay in receiving adequate and appropriate care once the health facility has been reached. Delay in receiving adequate and appropriate care once the facility has been reached is mainly due to operational factors and inadequacy in the health care delivery system. Such inadequacies may be characterized by shortages in supplies, equipment, and lack of trained personnel; and incompetence of the available staff (Waiswa, P et al., 2010).

In addition, based on our bivariate analysis (cross – tabulations), we found that there is a strong association between delays and men's involvement during pregnancy and childbirth in Zambia. However, when we do multinomial regression analysis of delays including men's involvement as well as other selected variables (men's education attainment and men's attitudes towards pregnancy and childbirth), men's involvement during pregnancy and childbirth is found not to be significantly associated with delays. Hence, from the findings above, it suffices to state that men's involvement during pregnancy and childbirth in Zambia does not explain delays. On the contrary, from the same multivariate multinomial regression analysis, we found that men's attitudes towards pregnancy and childbirth is strongly significantly associated with the delay in reaching an appropriate obstetric facility once the decision to seek care has been made as compared to the delay in making a decision to seek care when their wives or partners are experiencing an obstetric complication. We further found that men's education attainment is weakly significantly associated with the delay in receiving adequate and appropriate care once the health facility has been reached as compared to the delay in making a decision to seek care when their wives or partners are experiencing an obstetric complication.

5.2.3 Pregnancy complications

Likewise, even after adjusting or controlling for confounder variables namely type of place of residence, men's occupation, women's occupation and wealth index, we still found no significant association between pregnancy complications and adjusted men's involvement during pregnancy and childbirth in Zambia. This finding is contrary to what was expected due to the fact that we did not use robust indicators in measuring pregnancy complications. Pregnancy complications is a complex topic, which cannot be measured by a single indicator. This study measures pregnancy complication by considering questions on women's last birth by ceasarean section and time spent at place of delivery. Caesarian section is mostly done in urban areas and usually done to women from rich socio – economic conditions in Zambia. It is almost non extent in rural areas and no wonder we may have found strange results with regards to pregnancy complications. To improve the accuracy of the measure of pregnancy complications, we need to ask direct questions on symptoms and various kinds of obstetric complications as well emergencies experienced by women during pregnancy and childbirth. Furthermore, we need questions on birth preparedness and readiness including reasons as to why some Zambian women deliver by Caesarian section. These and many other questions or indicators are missing from the ZDHS data where it is impossible to get reliable, timely and robust indicators for measuring pregnancy complications.
Furthermore, in this study we found that pregnancy complications was not significantly associated with delays.

5.2.4 Neonatal deaths

Moreover, even after adjusting for confounder variables such as type of place of residence, men's occupation, and women's occupation, we still find no significant association between neonatal deaths and adjusted men's involvement during pregnancy and childbirth in Zambia. Furthermore, when we compute neonatal mortality rate in the five years preceding the survey at the macro level for both not involved and involved there is still no significant difference. Although being involved assures a survival of two more newborns as compared to those not involved.
Additionally, we found that there was no significant association between neonatal deaths and delays in Zambia. Surprisingly, we also found that neonatal deaths were not significantly associated with pregnancy complications in Zambia. This finding is contrary to what we had anticipated, as it is highly believed that maternal /pregnancy complications including deaths go hand in hand with neonatal deaths. It is argued that the well being of mother and newborn depends on the pregnancy care that a mother receives during her pregnancy. Newborn health and survival are closely linked to the care mother receives before and during pregnancy, childbirth, and the postnatal period. Hence, it is highly argued and assumed that most neonatal deaths branch from poor maternal health among other things.

5.3 Weaknesses of working with the Demographic Health Survey data

The Demographic and Health Surveys (DHS) project is designed to produce accurate and timely information on population, health, and nutrition in developing countries. DHS surveys are national sample surveys that provide key data for planning, monitoring, and evaluating programs in these areas. DHS data also play a major role in furthering international understanding of global population and health trends. The surveys provide an unparalleled body of comparable data on demographic, health, and nutrition indicators and the principal objectives of the DHS are as follows: 1) to improve the information base for policy development, economic and social planning, and the management of population and health programs; 2) to promote the widespread dissemination and use of DHS data by policymakers and planners; 3) to improve methodologies and procedures for conducting and analyzing demographic and health surveys. (ZDHS, 2007)
Working with DHS data is hampered by the limited availability of information and difficulty of use. For instance, a lot of pressing questions are missing from the current content of the core questionnaires which covers topics such as fertility, fertility preferences, family planning, marriage, women's empowerment, sexual activity, reproductive health, child health, environmental health, nutrition, AIDS and other sexually transmitted diseases, and socioeconomic conditions. Additionally, the questionnaire modules for men on HIV/AIDS, maternal mortality, and female genital mutilation etc have very few and limited questions. This makes it difficult if not impossible to conduct research targeting male involvement in female health issues. For example questions on men's involvement in various aspects of birth preparedness, and complications readiness should be added. Men have to be asked if they had made some arrangements like: saved money for delivery; arranged for transport to get to the place of delivery; transport in the case of an obstetric emergency; plans in case of pregnancy complications; identified compatible blood donor in case of emergency; desired place of delivery; the location of closest appropriate care facility; contacted health worker to help with delivery; bought safe delivery kit; indentified birth companion; and support in looking after the home and children if any, while the woman is away.

Furthermore, it is of immense importance for husbands to correctly identify symptoms related to obstetric complications and emergencies because they constitute serious situations for both mother and child. Failure to correctly perceive these conditions as serious by the men who are the main decision makers and financers of obstetric care may have serious consequences. Thus, it is important to include questions in the DHS on men's awareness of serious complications of pregnancy and childbirth and knowledge of emergence obstetric care and factors underlying obstetric complications.
Additionally, to capture men's involvement in pregnancy care, the DHS questionnaire should contain questions which ask men if they had helped with domestic work, gave advice for immunization and consumption of iron and folic acid tablets, advice on appropriate nutrition and rest during the time of pregnancy. Furthermore, men can be asked if they had supported their partners to buy vitamins and special foods (especially food rich in iron and fortified with vitamin A).

One other potential limitation is that it lacks direct questions on maternal health and mortality which are conventionally used as indicators of sexual and reproductive health programmes. For example, it is impossible to estimate maternal mortality directly using DHS data. However, DHS data only allows estimating maternal mortality using direct and indirect sisterhood methods. These two methods require using the sibling history data that is the number of sisters who died of maternity related causes. Since it is done retrospectively it is difficult to get valid and desired results when trying to find its relationship with variables such as men's involvement during pregnancy and childbirth. Furthermore, DHS data does not provide questions that allow one to find out the various types of maternal health complications experienced by women during pregnancy and childbirth.

Moreover, it is also impossible to find questions in the DHS regarding delays (decision to seek care, reaching care and receiving care) considering that the three delays model by Thaddeus and Maine (1994) has been widely applied in maternal health research. The model identifies individual decision making, access to affordable services, and the provision of skilled personnel as the main factors which can delay access to effective interventions to prevent pregnancy related complications and death. Furthermore, DHS data does not have questions on why women deliver by Caesarian section. Information on Caesarian section is important indicator of maternal health and could be very helpful for research and policy planning. As such there is need to include more questions on this topic to solicit more information and enlighten as many people as possible.

DHS data lacks detailed questions on important areas of maternal health including information on antenatal, delivery, and postpartum care and problems in accessing care. The health care that a mother receives during pregnancy, at the time of delivery and soon after delivery is important for survival and well being of both the mother and her child. However, it is difficult and almost impossible to measure the impact of men's involvement in maternal health using DHS data. There is need to include more questions in the men's questionnaire so as to capture more areas and information on maternal health.
The major objective of antenatal care is to achieve the optimal health outcome for the mother and the baby. Specifically, the following should be accomplished by a skilled health worker: 1) early detection of complications and prompt treatment (i.e., detection and treatment of sexually transmitted infections); 2) prevention of diseases through immunization and micronutrient supplementation; 3) birth preparedness and complication readiness; and 4) health promotion and disease prevention by providing health messages and counselling to pregnant women (ZDHS, 2007). Unfortunately, DHS lacks questions and information to ascertain the knowledge, understanding and involvement of men with regards to antenatal care. In addition, the DHS men's and women's questionnaires should contain questions which try to capture adequate information on home deliveries. For instance, type of complications faced during home delivery, presence of traditional birth attendant or skilled birth attendant during home delivery etc. Moreover, both questionnaires should also have questions which ask if men previously attended labour and delivery as well as attended postnatal care with partner.

And also to capture direct information on spousal communication about maternal issues which is usually computed using proximate variables.

5.4 Conclusion and policy implications

Men's involvement during pregnancy and childbirth is a very complex topic of discussion, which cannot be measured by a single indicator. Of course, mere involvement during pregnancy and childbirth as measured by men's attendance of wives' or partners' antenatal checkups defined in this study is not the only way that men can contribute to maternal and child health. But the combination of other variables such as; spousal communication about partner's health, husband's assistance in households and other activities could improve the accuracy of the measure of men's involvement during pregnancy and childbirth in general. For example, In particular, men can also provide advice on appropriate nutrition, immunization and or financial and emotional support including selecting birth location, identifying a skilled attendant and companion for birth. Furthermore, men can help in domestic work, arrange blood donors in case of complications and care for newborns. According to Mullany et al., (2005) male involvement in reproductive health is a burgeoning field, and as it develops, new and refined indicators of men's behaviours will emerge. The development of such indicators and measures is important as the field of men's involvement in maternal and child health grows. Given the prominent role of gender and gender relations in determining health behaviour and outcomes, the increased attention to men's health and men's influence on the health of their family is unlikely to fade. This focus on men's involvement should help us to better understand how individuals and families navigate the health care system, and to find new ways of addressing persistent health problems, including those associated with maternal and child health.

While the study shows that very few men are getting involved in the health care of their wives or partners, there is dire need for strengthened campaigns to improve the health of women in Zambia. One best approach is to promote education for men and women at all levels. This is one sure way that the ideals of the 1994 International Conference on Population and Development (ICPD) and the 1995 United Nation Fourth World Conference held in Beijing can be realised. Education is paramount. It can make the difference, even though it was found to be insignificant in the association with men's involvement but very significant in the association with delays which are very instrumental in explaining of maternal and child health. Furthermore, there is need also to create more free time or more flexible work schedules for men working in agriculture sectors to care for their wives or partners during pregnancy and childbirth and also to ascribe to norms about fatherhood that facilitate involvement in family health. As rightly pointed by Carter (2002), men's involvement during pregnancy and child birth is multi- dimensional. He also brings out the fact that the dynamics of men's involvement vary as the context does: pregnancy care and presence at the time of birth engage different elements of gender and household structure and produce distinct patterns of male involvement. Programme managers and policy makers should recognize this fact and should try to bring in this multi-dimensional nature of men's involvement into policies and programmes for better utilization of the maternal and child health related services.

Finally, it is evident that a large percentage of men (82.5 percent) are not involved during pregnancy and childbirth in Zambia. Only a handful (17.5 percent) of men is involved during pregnancy and childbirth in Zambia. More men from rural areas as compared to urban are involved during pregnancy and childbirth in Zambia. Religion and women's occupation influence or determine men's involvement during pregnancy and childbirth in Zambia. Men's involvement during pregnancy and childbirth in Zambia does not play any role in pregnancy complications and neonatal deaths. However, even after adjusting or controlling for type of place of residence, men's occupation, women's occupation, and wealth index (confounders) , we still find no significant association

between pregnancy complications and adjusted men's involvement during pregnancy and childbirth in Zambia. Similarly, we still find no significant association between neonatal deaths and adjusted men's involvement during pregnancy and childbirth in Zambia even after adjusting for type of place of residence, men's occupation and women's occupation (confounders).Such unexpected findings maybe true, but might also be attributed to the lack of robust indicators, lack of detail as well as limited and untimely data on the part of DHS. Hence, it is very important to make DHS data very relevant and current by frequently updating the core questionnaires to match and capture the emerging issues on the international agenda, particularly men's involvement in maternal and child health. This will entail swiftly revising and adding more questions in the questionnaires. Consequently, this will enable population and sexual and reproductive health researchers to easily conduct research targeting male involvement in female health issues.

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