

Factors affecting Ghana's ability to achieve the Millennium Development Goal Five

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Abstract

Maternal mortality is a prevalent problem particularly in developing countries including Ghana and as a result, the United Nations has set a goal on maternal health to be achieved by all member countries by 2015; Millennium Development Goal (MDG) 5 which aims to achieve a seventy-five per cent reduction in maternal mortality between 1990 and 2015 levels and also increase access to reproductive health. This study investigates the factors affecting Ghana's ability to achieve the MDG 5 as well as examine the factors that influence a woman's choice of place of delivery using the logit and the multinomial logistic econometric models. The study uses secondary data from Ghana Maternal Health and the Ghana Demographic and Health Surveys. Results from the study reveal that, factors such as residence, abortion, place of delivery and women's educations, the household size, number of children, ethnicity, religion, residence, antenatal care and distance are found to be significant. It is recommended that, government improves on the distribution of health facilities, human resources and necessary infrastructure as well as allow safe abortion services to the full extent of the law. In the interim, policy should focus on absorbing the indirect cost incurred in seeking maternal health care services as well as promote education formal and informal in the country are among the recommendations made in this study.

Key words: Millennium Development Goal, Maternal Health, Maternal mortality

Introduction

A United Nations survey revealed that, an estimated 529,000 women die each year in the world from complications during pregnancy and childbirth, and a number of these deaths occur in developing nations (WHO et al., 2004). Maternal mortality is a prevalent problem particularly in developing countries of which Ghana cannot be left out. In response to this, the United Nations Millennium Development Goal 5 has targeted a 75% reduction in maternal mortality between 1990 and 2015 and also to increase access to reproductive health. This is expected to be achieved by all member countries by 2015. Despite the efforts and interventions being put forth, Ghana's maternal mortality still remains relatively high. Ghana finds herself at a place where a little below half of her expectant mothers do not to deliver with health facilities especially, for the privileged localities who happen to have such services. Maternal mortality as it stands, does not

only pose a threat to the individual mother and her baby but also has clear implications for the nation's productive capacity, economic well-being and labour supply. This transmits into huge economic losses and social hardships. It is against this backdrop that this study sought to investigate the factors that accounts for the high rates of maternal mortality.

Maternal Mortality in Ghana: A Statistical Overview

Ghana, like other developing countries has a high maternal mortality rate. Annual Reports from the Ministry of Health indicated an upward trend in Ghana's maternal mortality rate. It was estimated to be 585 per 100,000 live births in 1996. By 1997, it rose to 687 but declined to 111 in 1998. The year 1999 saw a sharp rise in maternal mortality rate to 813; and stood at 851 at the end of the year 2000 (Annual report , MOH). The Ghana Maternal Health Survey, 2007 indicates that maternal mortality ratio in Ghana remains unacceptably high at 451 deaths per 100,000 live births. In addition, statistics from the Ghana Health Service (GHS) also indicate that 953 women died in 2008 from pregnancy and delivery complications in our health facilities. The World Bank report indicated a downward trend in Ghana's maternal mortality ratio. It was estimated to be 440 per 100,000 births in 2004 and was maintain at the same rate till 2006. It fell further to 350 per 100,000 births in 2010. According to World Development Indicator however, Ghana's maternal mortality ratio was 380 deaths per 100,000 live births as of 2013. Meanwhile a report by the Ghana Health Service (2012) shows that Ghana recorded 894 deaths in 2010 and 1,022 maternal deaths in 2011 which depicts an increase in the cases of maternal death.

The Minister of Health in 2013 revealed that maternal mortality rate reduced from 740 per 100,000 live births in 1990 to 503 per 100,000 live births in 2005 and then to 451 per 100,000 live births in 2008 and this pre-supposes a figure of 340 per 100,000 live births by 2015. This is far above the United Nations MDG target of 185 per 100,000 live births (Ghana News Agency (GNA), June 13th 2013). It is important to mention that, maternal mortality occurs in all the regions of Ghana irrespective of the number of health institutions and trained personnel available. Existing statistics indicate that, between 1996 and 2000, Ashanti Region recorded, on average, the highest number (24%) of maternal death in Ghana. This was followed by the Central and Eastern Regions, each recording 16 percent. 13 percent and 10 percent of maternal deaths occurred in the Brong Ahafo and Volta Regions respectively; whilst the Northern, Western, and Greater Accra recorded 9 percent each. Upper East and Upper West respectively recorded 8 percent and 4 percent over the period. As one would expect, there are regional variations. Out of this number, it is estimated that Ashanti Region records the highest figure of 22 maternal deaths, followed by Greater Accra with 15, Western had 11, Brong Ahafo Region with 13, and Volta, Central and Eastern regions recorded nine each, while the Upper East and the Upper West regions had two each (Ghana Health Service, 2008). Ashanti Region currently records 315 maternal deaths per 100,000 live births - the highest rate in the country, the Ghanaian Chronicle reported on May 13th, 2013.

In 2010, the figure was just 190 deaths per 100,000 live births. One hundred and twenty two institutional maternal deaths were recorded in the Eastern Region in 2013. The figure is an increase from 116 maternal deaths recorded in 2012 (Health News of Thursday, 6 February 2014, Daily Heritage). Northern region on the other hand reported a fall in the maternal deaths from 119 in 2012 to 106 in 2013 (Tamale, Feb 20, GNA). Maternal Mortality in the Upper East Region has reduced consistently from one 141 per 1,000 live births in 2010 to 111 per 1,000 live births in 2013. The Upper West Region recorded a total of 28 maternal deaths for the year ending 2012 representing a marginal drop of 3% over the 2011 figure of 29 deaths.

The Brong-Ahafo Region witnessed a slight decrease in maternal mortality from 109 deaths in 2012 to 95 deaths in 2013 (Feb. 19, GNA). The Greater Accra Region, the nation's capital continues to record high maternal deaths with an available statistics indicating that a total of 242 women between 10 years and 35 years died while giving birth in 2011, 163 died in 2010 and 166 died in 2009. The Central Region on the other hand recorded seventy four maternal deaths in 2011. Though the figures show a decrease for some regions and an increase for others, it is still above the national average of 21 deaths per a region.

It is disturbingly revealing from these figures that, rather than reducing, the number of cases of maternal mortality in Ghana, it is rather increasing annually. These figures, according to the Ministry of Health and the Ghana Health Service, did not include those women who died silently in communities and were quietly buried without registration. Like crime statistics, the 'dark figure' —the number of unreported cases— will never be known, especially so in the Ghanaian context where domiciliary delivery outnumbers institutional delivery and where deaths are usually not reported. Senah (2003) noted that institutional figures are also problematic because our health institutions woefully lack effective records system.

Health Interventions for Reducing Maternal Mortality in Ghana

Formal policies for Maternal and Child Health (MCH) care started in Ghana as far back as the 1920's. At the end of 1972 about 416 health institutions had been established in the country. These are made up of government hospitals, health centres, health posts, private midwives clinic and homes, private doctors' clinics and hospitals and mission hospitals and clinics offering health services to mothers and children. In 1987, the World Health Organisation and other United Nation agencies like the United Nations International Children's Emergency Fund (UNICEF) launched the Safe Motherhood Initiative and since then, several safe motherhood units have been and continue to be implemented in Ghana (Biritwum, 2006). In 1995, the Ghana Health Service of the Ministry of Health launched the National Safe Motherhood Programme with the main objective of reducing the high levels of maternal mortality and morbidity through improving the quality and coverage of maternal health services, and to increase the awareness about maternal health issues in communities (Osei et. al., 2005). The safe motherhood programme is a national reproductive health service delivery which is delivered through the Primary Health Care (PHC) Programme.

Some policies that have been taken to reduce maternal mortality in Ghana as presented during an Economic and Social Council (ECOSOC) Annual Ministerial Review (Anonymous, 2007) of the UN include the following;

- ✚ Prevention Maternal Mortality Programme (PPM) – This is the component of the Safe Motherhood Initiative mainly to promote maternal health by focusing on interventions that will contribute to the improvement in the availability, quality and utilization of emergency obstetric care.
- ✚ Making Pregnancy Safer (MPS) Initiative – This is also another component of the Safe Motherhood Initiative which is derived through the PHC programme. There are four parts in this intervention, they are:
 - Care during pregnancy whereby antenatal care, treatment of severe anaemia, syphilis and other sexually transmitted diseases such as gonorrhoea are given.
 - Care during and after delivery and this delivery by skilled birth attendant, routine new born care, management of postpartum haemorrhage, etc.
 - Postpartum family planning deals with the provision of condoms, Depo-Provera, etc.
 - The community component includes community health compounds, Traditional Birth Attendants, Prevention and Management of Unsafe Abortion Programme, etc.
- ✚ Maternal and Neonatal Health Programme (MNH) – This is also a component of the Safe Motherhood Initiative and includes antenatal care, labour and delivery care, postnatal care, etc.
- ✚ Ghana VAST Survival programme – This is an initiative that focuses on controlling the problem of Vitamin A deficiency in Ghana and reducing maternal and child mortality associated with Vitamin A deficiency.
- ✚ Maternal Health Project – Here, the emphasis is on the prevention and promotion of safe motherhood interventions made up of the following:
 - Dissemination of a revised Reproductive Health Service policy and Standards and protocols for reproductive health programmes;
 - Strengthening of institutional capabilities to provide essential obstetric care;
 - Implementing exemptions for supervised delivery in deprived areas;
 - Strengthening post abortion care services;
 - Ensuring contraceptive commodity security;
 - Intensifying the health promotion activities in safe motherhood and family planning, etc.
- ✚ Intermittent Preventive Treatment (IPT) – With the aim of controlling pregnancy associated malaria, this programme is based on the assumption that every pregnant woman living in areas of high malaria transmission has malaria parasite in her blood or placenta, whether or not she has symptoms of malaria. Some of the interventions are:

- Iron and folic acid supplementation;
- De-worming;
- Case management and
- Insecticide Treated Nets (ITNs).

Free Maternal Health Policy in Ghana

Over the past decade many countries in Sub-Saharan Africa, especially countries with high maternal and child mortality rates have implemented various health policies with the main objective of reducing these unacceptable rates of maternal and child morbidity and mortality by either removing or reducing the financial barriers in the utilization of health care services. For instance, in 2006, free health service for pregnant women and children below five years were introduced in Burundi. In the same year the government of Zambia introduced free health service for pregnant women in the rural districts.

Similarly, in Burkina Faso, an 80% subsidy policy for child delivery in 2006 was introduced to encourage deliveries in health facilities where skilled birth attendants would assist. Liberia introduced free PHC in 2007 while Sudan announced free care for caesarean sections and children in 2008 (Witter et al., 2009).

In Ghana, the government introduced free child deliveries in September 2003 in the four most deprived regions that is, the Central, Upper East, Upper West and Northern regions. Later, the policy was extended to the remaining six regions in April 2005 (Witter et al., 2009). In the policy, pregnant women were given free medical care in public, mission and some selected private facilities. Initially, the policy was funded through the Highly Indebted Poor Country (HIPC) debt relief funds. In addition, the National Health Insurance Scheme was introduced to provide a wide range of health services beyond the antenatal, delivery and postnatal services even though the free delivery policy was still in existence (Opoku, 2009). Later, due to lack of funds some facilities reverted to charging for delivery services. Analyses of how money was allocated and used for delivery care suggested that while funds were available from the government, facilities increased their revenue, with reimbursements from the government exceeding losses from user fees forgone. Once funds ran out, facilities accrued debts and eventually abandoned the policy (IMMPACT, 2007).

Literature Review

This section reviews related literature on maternal health care and its effects on maternal mortality. At the micro level, some of the factors that have been identified to influence a women's decision at birth, usually include, personal and socio-cultural factors, geographical and environmental factors and health services (Anyanwu & Erhijakpor, 2007). Literature conducted both within and without Ghana on most of these factors is thoroughly reviewed here.

The requirement of 'ensuring a skilled attendant or a professional at delivery for all' is core to reducing maternal morbidity and mortality. Nevertheless, the route to achieving this ought to embrace the complex range of issues of female reproductive health that include education, health system organization and functioning, human resource management as well as the social, cultural, political and economic environment that impact on women's access to care. Ronsmans et al., 2009 in their study have shown that the use of maternal health facilities and supervision by skilled personnel during pregnancy and childbirth are effective in reducing maternal mortality. That is to say, the proportion of deliveries attended to by skilled health personnel is crucial in the quest to reducing the incidence and prevalence of maternal mortality and morbidity. It was therefore not surprising when the United Nations employed supervision by skilled professionals as one vital indicator for measuring progress towards the fifth MDG. Mrisho, M. et al., (2007) presented as part of their findings that, poor women were more likely to deliver at home or at the home of a TBA than rich women. This result is contrary to the findings of a study in Nepal that suggested that economic factors were of little importance in influencing place of delivery (Bolam, A. et al., 1998). In resource-poor settings, home delivery is usually the cheapest option, but is associated with attendant risks of infection and lack of available equipment should complications occur (Thind et al., 2008). Babalola et al., (2009) added that, despite the danger associated with home delivery, the use of reproductive health services remains low, and home delivery among women of child bearing age is widespread, hence maternal morbidity and mortality remains a public health problem. Traditionally, pregnant women prefer home deliveries in Ghana, Bazzano et al., (2008) concludes. Ngom et al., (2003) in their study concludes that, in Ghana for instance, the level of reproductive health is impeded by low levels of women's education, status and negative traditional beliefs and attitudes. Social, educational and economic inequalities were identified as among the reasons why girls and women often do not utilize health services.

Empirical studies have come out with different findings on the effect of age on the utilization of health services; it may have a positive or negative influence hence its effect is indeterminate. Ortiz (2007) on the other hand, concluded that the age of delivery of the mother has a linear positive relationship with the probability of attending the first consultation of antenatal services. This, Ortiz argues is necessary given that the MDG 5 aims at improving maternal health through one of its indicators which is antenatal care.

In Britain, it was found that the decline in mortality rates were closely associated with the improvement in the living standards rather than medical breakthroughs (Mckeown et al., 1972). A similar conclusion was also made by Arriaga and Davis (1969) for Latin America. What Mckeown et al., 1972 could have also acknowledged was the fact that, the decline in mortality rates could also be due to preventive education and good nutrition among others. Also, health expenditures of household members in rural India were found to be sensitive to changes in household income levels (Mathiyazhagan, 2003) and this includes the utilization of maternal health services. Though the effect of income was small in the study in Jajpur district of Orissa in India (Rout, 2006), the relationships was still positive. That is, the decline in mortality rate was so closely related to improvements in living standards. Without controlling for any key

variable(s), it was evident that income was a key determinant of the demand for health services by expectant mothers in Ghana (Nketiah-Amponsah and Sagoe-Moses, 2009).

The distance involved in getting to the nearest health facility that provides the required maternal health service is necessary in determining women's utilization of health care services. This includes the time spent to travel and how improved the road network is. The more distant a facility is from potential users, the less likely it is to be visited. Another important factor that influences quality of health care service is accessibility to health center. The standard is that every pregnant woman should have access to a health facility within less than 5km. Many of the women in rural Tanzania prefer to deliver at home because of inaccessible health facilities (Mrisho et al., 2007). Kawuwa et al., (2007) also found in Nigeria that the women were compelled to deliver at home just because the health facilities were inaccessible. In rural Afghanistan, when provision was made for transport, high skilled attendance coverage was achieved (Hadi et al., 2007). Using the distance to any medical provider as an equivalent to the distance to a health facility that provides MHC service from the GLSS 4, Overbosch et al., (2004) revealed that, more than a third of women in the rural areas have to travel more than five kilometers (5km) to a modern health care provider that typically provides antenatal and other related maternal care services. Here, although about 61.5 percent of women could access a nurse or medical assistant within five kilometers, doctors were the least available. In Ghana, Nketiah-Amponsah and Sagoe-Moses (2009) found distance to the nearest health facility as significant and inversely related to the utilization of maternal health care services in Ghana. Abhor and Abekah-Nkrumah (2009), also found a significantly negative relationship between place of residence and the use of maternal health care services. The study concluded that compared to those residing in the rural areas, urban women are less likely to deliver at a health facility and use postnatal care services. This however contradicts what other researchers have found empirically. It is important to note that, (i) a significant proportion of births continue to occur at home without a professionally trained health worker, (ii) the fraction that give birth at home increases dramatically with distance from main urban centres, and (iii) progress in reducing maternal deaths remains slow (Ghana Statistical Services).

Induced abortion evokes a great deal of passion and controversy which border on religion, culture, ethics and morality. In Ghana, it is said to be the primary cause of maternal mortality. In traditional Ghanaian societies, termination of pregnancy is frowned upon; indeed, it is considered murder (Gyekye 1996). It is, therefore, resorted to in great secrecy. Health care providers' attitude is another essential component of quality of health service. A study revealed that staff attitude remains a hindrance to accessing professional services among pregnant women in rural Tanzania (Mrisho et al., 2007). Poor health providers' attitude and fear of punishment by health care providers in form of abusive language, denying women service and refusing to assist properly among others were given as reason why pregnant women would not want to deliver in a health facility. Ngom et al., (2003) in their study concludes that, in Ghana for instance, the level of reproductive health is impeded by low levels of women's education, status and negative traditional beliefs and attitudes. Social, educational and economic inequalities were identified as among the reasons why girls and women often do not utilize health services. African countries

that reported that, single women were more likely to induce abortion than married women (Calves, 2002).

Being a natural process and not necessarily a disease, women with an experience in pregnancy might see the utilization of maternal health care services as relatively less important. In other words, women who have successfully gone through the normal birth process might consider the use of MHC services as less necessary for their subsequent pregnancies. According to Elo (1992), birth order also influence on the use of MHC services. Here, women who are experiencing or going through their first pregnancy are more likely to seek maternal care services than women who have successfully passed this stage. To a large extent another contributing factor overlooked could be the educational orientation of the mother. The more educated the mother is, she understands the risks involved in delivery and therefore irrespective of the number of children she has in her lifetime she would deliver with a health institution. In the study by Wong et al., (1987) the authors believed that having more children may cause resource constraints which may have a negative effect on the utilization of health care services. Again, women with more children may not fully utilize the available health care services since there would be too many demands on their time which may force them to forego health care services. This would add to the number of unreported maternal deaths, since these women would opt to deliver at home which is highly associated with complications. (Envuladu et al., (2013) in a study found that the older women chose home delivery more than the younger women probably because they felt they have gathered some experience and not really afraid of the danger.

In order to ensure safe delivery of normal babies, each society prescribes certain dietary and behavioural taboos or observance, which pregnancy women must comply with. In many societies in Ghana, it is culturally regarded immodest to show early signs of pregnancy until it is visible (Arhin, 2001). Consequently, often the prenatal screening for risk factors is missed.

Data

The study utilizes the 2007 Ghana Maternal Health Survey which is the first nationally representative population-based survey to collect information on maternal health and mortality in Ghana through a combination of data collection at the household level, individual woman's level and a follow-on verbal autopsy into the specific causes of female deaths, particularly maternal deaths. The GMHS was carried out in two phases. A short household questionnaire was administered in Phase I in some 240,000 households to identify deaths to females age 12- 49. A total of 5,931 female deaths were identified in Phase I and verbal autopsies were completed for 4,203 deaths in Phase II. A household questionnaire and woman's questionnaire were administered in a subsample of households in Phase II to collect information on key demographic and health indicators including antenatal, maternity, and emergency obstetric care in the event of a birth, abortion, or miscarriage. In addition, a sibling history in Phase II provides direct estimates of maternal mortality. Phase II surveyed 10,858 households, and 10,370 women age 15-49. The GMHS was implemented by the Ghana Statistical Service (GSS) and the Ghana

Health Service (GHS) with technical assistance from Macro International Inc. The 2007 GMHS is intended to serve as a source of baseline information for the Reducing Maternal Morbidity and Mortality (R3M) program initiated in 2006.

Model Specification and Empirical Framework

This study is essentially founded on the theory of ‘demand for health’ propounded by Grossman (1972) which was later extended and simplified by Wagstaff (1986). The theory of ‘demand for health’ is based on three fundamental economic principles, namely; the indifference map, the production function and the budget constraint. These concepts have been discussed in the previous chapter (under the theoretical review). A health production function describes the relationship between combination of health inputs, both medical and non-medical, and resulting health output. It shows how health inputs interact to produce a particular level of health, and how health status changes if health inputs are used and their combination changes. Grossman (1972) developed a theoretical health production function, which can be specified as:

$$H=F(X)..... (1)$$

Where H is a measure of individual health output and X is a vector of individual inputs to the health production function F. The elements of the vector includes: nutrient intake, income, consumption of public goods, education, time devoted to health related procedures, initial individual endowments like genetic makeup, and community endowments such as the environment. This theoretical model was designed for analysis of health production at micro level. The model used in this study is based on the health production function concept of the theory of ‘demand for health’ which postulates that people/nations produce health by utilizing socioeconomic variables. Hence health is a function of socioeconomic variables.

Mathematically, this is written as follows:

$$\text{Health} = f(\text{socio-economic variables})..... (2)$$

Since the current study is interested in the factors that affect Ghana’s ability to achieve the MDG 5, equation 2 is further broken down to include the socio-economic determinants employed by the study that adversely affect improved maternal health as shown below

$$MH = f(\text{Age, Abortion, Malaria, Place of delivery, Marital status, Education, Economic status, Antenatal care, Region, Religion, Household size, Number of children, Distance to the nearest facility, Pre-natal care, Place of delivery, Availability of skilled attendant, Residence and Ethnicity})(3)$$

Where, MH is defined as maternal health.

The empirical model to be used in this study is adapted from the works of Asamoah et al., (2011). McCullough and the Nelder, (1989) were of the view that, the Logistic regression models

are perhaps best viewed as instances of generalized linear model where the response variable follow a Bernoulli distribution and the link function is the logit function. In order to investigate the various factors that contribute to maternal mortality, the study starts with a health status model specified in a panel form as follows:

$$Y_i = \beta_1 + \sum_{i=2}^n \beta_i X_i + \mu_i \dots\dots\dots(4)$$

Where,

$Y_i = 1$, If the woman died before, during and 42 days after pregnancy

$Y_i = 0$, If otherwise

β_1 = Intercept

β_i = Regression coefficients

X_i = Independent variables

μ_i = The error term this is assumed to be normally distributed.

Following the logit model, the empirical model is specified as:

$$MM = \beta_0 + \beta_1 AG + \beta_2 AB + \beta_3 Res + \beta_4 Avail + \beta_5 Mal + \beta_6 Marsta + \beta_7 Plad + \beta_8 Educ + \mu_i \dots\dots\dots (5)$$

Where:

MM = Maternal Mortality; AG = Age; AB = Abortion; Res = Residence; Avail = Availability of skilled attendant at birth; Mal = Malaria; Plad = Place of delivery; Marsta = Marital status; Educ = Education

Discussion of Results

Descriptive Statistics for the dependent variable

The table below presents the summary of the number of maternal deaths by considering the number of women who died from pregnancy as recorded in the verbal autopsy questionnaire of the 2007 GMHS dataset.

Table 1: Pregnant at death

	Frequency	Percentage	Cumulative
Yes	264	6.5	6.9
No	3804	93.5	100
Total	4068	100	

Source: Constructed from 2007 GMH

The logistic regression model was estimated to identify the factors that contribute to the high maternal mortality rate. Here the dependent variable assumes a value of one (1) if a woman was pregnant at the time of death and zero (0) if otherwise. Table 5.5 below presents the marginal effects for the various categories from the Logistic regression.

Table 5.3 Estimated Marginal Effects from the Logit model

Variable	Marginal effects	Standard errors	Z	P> z
Age	-0.03***	0.00	-6.65	0.00
Educational level				
Primary	-0.06	0.02	-0.26	0.80
Secondary	0.06**	0.03	1.93	0.05
Never attended	0.02	0.02	1.07	0.28
Marital status				
Married	0.08***	0.00	10.32	0.00
Separated	-0.04	0.00	-0.51	0.61
Divorced	-0.05	0.00	-0.67	0.51
Residence				
Rural	0.08**	0.09	0.95	0.04
Abortion				
Yes	0.17***	0.04	3.92	0.00
Malaria				
Yes	-0.03*	0.02	1.76	0.08
Skilled attendant				
Yes	-0.02*	0.00	-1.84	0.07
Place of delivery	0.03***	0.00	6.48	0.00

Number of observations = 4066
Prob > chi2 = 0.000
Pseudo R2 = 0.1332
Wald chi2 (12) = 185.12

Source: Author's computation from GMHS 2007

The age of the woman was found to be negatively related to the probability that she died during pregnancy. The results reveal that, as a woman advances in age the probability of her dying from pregnancy reduces by 3% compared to those who do not die from pregnancy. It is significant at 1%. Thus the study suggests that older women are less likely to die from pregnancy compared to the younger women. This follows the predictions of Grossman model in which he posits that age increases the rate of depreciation of the health of the individual, it may therefore be possible that, the older women may patronize health services or invest more in their health than the younger ones. It could also be that older women have more experience with pregnancies than the younger ones and therefore would be more knowledgeable in the cautions to take during pregnancy. One other possible reason could be attitudinal behaviours on the part of the younger women.

The influence of education was apparent from the estimation results. The woman's level of education was revealed to be significant at 5% only for women with secondary education for all the education categories used in this study. Using women with the highest education as the reference category, the probabilities of women dying from pregnancy reduces by 6% for women with primary education whereas it increases by 6% and 2% for women with secondary and no education respectively. What is expected is that women with at least a secondary level education would rather be more informed on the dangers associated with maternal health and therefore would take all the precautions necessary. Among the reasons women with an educational level above the primary gave as to why they would still not deliver with a healthy facility was that, with home births the mother is in a warm and comfortable environment where she can be nurtured by loved ones (GSS report, July 2013).

The results reveal that the marginal effect of married women is positive. The probability of a married woman dying during pregnancy compared to the reference category (single) increases by 8% and it is significant at 1%. In a developing country like Ghana, existing inequalities in an environment where men wield so much authority can have negative implications for women's reproductive health outcomes. Single or divorced women may be poorer but enjoy greater autonomy than those married. The result from the study of Smith et al., (2012) support the finding of this study when they conclude that the marital status of a woman does not act independently to affect her choice of place of delivery and use of maternal health services. Similar findings have been found by the study done in Botswana on the factors associated with non-use of maternal health services in which married women utilizes less health facility during delivery (Letamo G et al., 2003). This is explained to be due to the fact that, young single mothers may be cared for by their natal family, which may encourage skilled attendance, especially for a first birth and on other hand married women cannot decide on their own to seek care, but have to seek permission from a husband or mother-in-law and for majority of them, they lack power of controlling resources.

The results from the study suggest that, abortions increase the probability of a woman dying by 17%. That is, it adds to the number of maternal deaths, rather than reduce it. It is significant at 1%. A typical Ghanaian society frowns on particularly teenage pregnancy. The fear of being victimized sometimes pushes the younger ones to indulge in abortion. The inability of the mother to cater financially for herself and the unborn child, could also lead to abortion. In traditional Ghanaian societies, termination of pregnancy is frowned upon; indeed, it is considered murder (Gyekye 1996). It is, therefore, resorted to in great secrecy. The findings from the study by Asamoah et al., (2011) reveal that, married women had lower risk of dying from abortion-related causes compared to single women. This is supported by studies in other African countries that reported that single women were more likely to induce abortion than married women (Calves, 2002).

The results from the analysis show that, the probability of an expectant mother dying from malaria decreases by 3% and it is significant at 10%. This is a better outcome than the study of Asamoah et al., (2011), where malaria was found to be the single highest cause of maternal deaths (53.6%). This improvement may be as a result of the number of initiatives undertaken to curb the incidence of malaria in Ghana. Prevention measures including not just the free

distribution of insecticide treated nets (ITNs) but actual door-to-door campaign to hang these nets by community-based volunteers has enhanced usage. A post evaluation survey undertaken after one such campaign in the Northern Region indicates that the number of pregnant women sleeping in the net increased from 7% to 39.5% (GDHS 2008).

Living in a rural area increases the probability that a woman would die during or from pregnancy by 8%. It is significant at 5%. This implies that living in the rural area increases the incidence of maternal mortality. The positive effect might be due to the lack of adequate health facilities in the rural areas compared to the urban centres. Mrisho, M. et al., (2007) in their studies conclude that in most developing countries urban areas are well served with medical and health facilities. Another could also result from transportation to and from the health facilities as the transport network is mostly poor in the rural centers compared to the urban centers. The rural dwellers are normally known for upholding certain cultural beliefs and norms therefore holding on to these beliefs would deter expectant mothers from seeking the necessary aid when they are expecting and therefore puts their life in danger. Mrisho, M. et al., (2007), posits that rural women are more readily influenced by traditional beliefs and practices that are contrary to modern health care. Arhin (2001) also concludes that in many rural societies in Ghana, it is culturally regarded immodest to show early signs of pregnancy until it is visible. Consequently, often the prenatal screening for risk factors is missed which exposes the mother to maternal death.

Compared to the reference category (no) the variable skilled attendant at birth is negatively related to maternal deaths. The results show that the presence of a skilled attendant at birth reduces the probability of maternal death by 2%. It is significant at 10%. This is consistent with the study by Ronsmans et al., (2009) who arrived at the conclusion that, the use of maternal health facilities and supervision by skilled personnel during pregnancy and childbirth are effective in reducing maternal mortality. It is in this use that WHO (2004) employed supervision by skilled professionals as one vital indicator for measuring progress towards the fifth MDG, improving maternal and reproductive health.

The results reveal that where a woman decides to deliver is very significant in the unfolding incidence of maternal mortality. The results from the study reveal that the place of delivery increases the probability of maternal death by 3% and it is significant at 1%. What this implies is that most deliveries do not occur in resource-sufficient health facilities and therefore the expectant mother is exposed to risk associated with delivery. This is consistent with the conclusion drawn by Babalola et al., (2009) who added that, despite the danger associated with home delivery, the use of reproductive health services remains low, and home delivery among women of child bearing age is widespread, hence maternal morbidity and mortality remains a public health problem. The results also confirms earlier studies by Thind et al., (2008) who also found that though home delivery is usually the cheapest option, it is usually associated with attendant risks of infection and lack of available equipment should complications occur.

Conclusion and Recommendations

The study mainly sort to address Ghana's inability to achieve the Millennium Development Goal 5. Most of the attention is directed at setting up institutions and establishing policies aimed at reducing maternal mortality and improving maternal health. Not to say they are bad; but there is the need to understand certain factors from individual demographic and socioeconomic characteristics that inform women's decision when it comes to their health. On answering the objective of the study using the 2008 Ghana Demographic and Health Survey, variables such as age, education, place of delivery, the presence of a skilled attendant at birth, place of residence, malaria and marital status were found to significantly influence the incidence of maternal mortality. Based on the findings, the following recommendations are made for policy consideration. From the study distance (as measured to include transportation to the nearest health centre) costs are major obstacles in reaching appropriate obstetric facilities. It is recommended that measures be put in place to intensify the use of the mobile clinics particularly in the regions that have less health facilities. In order to reduce the number of women who do not use a modern health facility during pregnancy and delivery, there is need to improve coverage of health facilities that provide skilled delivery care, especially in the underserved regions. in the interim; policy should focus on providing some means of support to expectant mothers, especially those in the poorest and poorer categories to assist them in the use of MHC services alongside the free maternal health policy. This may help them cater for the indirect costs of using MHC services in Ghana. To avoid maternal deaths, it is also vital to prevent unwanted and too-early pregnancies. All women, including adolescents, who need access to contraception, safe abortion services to the full extent of the law, and quality post-abortion care should be attended to.

References

- Abor and Abekah-Nkrumah. (2009) "The socio-economic determinants of maternal health care utilization in Ghana." Submitted to African Economic Research Consortium.
- Anyanwu, J. C. and Erhijakpor, A. E. O. (2007) "Health Expenditures and Health Outcomes in Africa", *African Development Review*, 21(2), 401-434.
- Arhin J.Y.K. (2001) "The management of pregnancy in a rural community: a case study of Anyaman". Unpublished M.Phil thesis, Department of Sociology, University of Ghana.
- Arriaga, E.E. and Davis, K. (1969) "The Pattern of Maternal Change in Latin America". *Demography*, 6(3): 223-242.
- Asamoah et al. (2011) "Distribution of causes of maternal mortality among different socio-demographic groups in Ghana; a descriptive study." *BMC Public Health* 2011 11:159.

Babalola, S. and Fatusi, A. (2009) "Determinants of Use of Maternal Health Services in Nigeria - Looking Beyond Household and Individual Factors." *BMC Pregnancy Childbirth*. 2009; 9:43.

Bazzano, A. N., Kirkwood, B., Tawiah - Agyemang, C., Owusu - Agyei, S., and Adongo, P. (2008) "Social costs of skilled attendance at birth in rural Ghana." *Int J.Gynae- col Obstet*. [Accessed on 11th July 2008].

Biritwum, R. B. (2006) "Promoting and Monitoring Safe Motherhood in Ghana". *Ghana Medical Journal*, 40(3): 78-79.

Bolam, A., Manandhar, D.S., Shrestha. P., Ellis, M., Malla, K. and Costello, A.M. (1998) "Factors affecting home delivery in the Kathmandu Valley". *Nepal Health Policy and Planning* 13(2):152-158

Calves A.E. (2002) "Abortion risk and decision making among young people in urban Cameroon." *Stud Fam Plan*, 33(3):249-260.

Daily Heritage. "122 maternal deaths recorded in E/R." Health News of Thursday, 6 February 2014.

Elo, I.T. (1992) "Utilization of Maternal Healthcare Services in Peru; The Role of Women's Education." *Health Transition Review*, 2(1):49-69.

Envuladu E.A, Agbo H.A, Lassa S, Kigbu J.H, Zoakah A.I. (2013) "Factors determining the choice of a place of delivery among pregnant women in Russia village of Jos North, Nigeria: achieving the MDGs 4 and 5." *Int J Med Biomed Res*; 2(1):23-27.

Ghana Demographic and Health Survey (GDHS) Key Findings, (2008).

Ghana Health Services (2012). Annual Report. Ministry of Health, Accra.

Ghana News Agency. "The nation needs more midwives - Sherry Ayittey." Friday 21st June, 2013.

Ghana News Agency. "Maternal mortality reduces in Brong-Ahafo Region." Wednesday, Feb. 19, 2014.

Ghana News Agency. "Northern Region recorded 106 maternal deaths in 2013." Thursday, February 20, 2014.

Ghana Statistical Service (2013) "2010 Population and housing census report." Ghana Statistical Service, Accra.

Ghanaian Chronicle. "Ghana: Ashanti Region Fails to Meet MDG Target On Maternal Death." By Sebastian R. Freiku, 13 May 2013.

Grossman, M. (1972) "The Demand for Health: A Theoretical and Empirical Investigation." New York: NBER.

Gyekye, K. (1996) "African Cultural Values: An Introduction." Accra: Sankofa Publications.

Hadi, A., Rahman, T., Khuram, D., Ahmed, J., and Alam, A., (2007) "Raising Institutional Delivery in War-Torn Communities: Experience of BRAC in Afghanistan." *Asia Pacific Journal of Family Medicine*.

IMMPACT. (2007) "Evaluating Removal of Delivery Fees in Ghana". [http://www.abdn.ac.uk/wdu016/uploads/files/Impact_Evaluating Removal of Delivery fees in Ghana.pdf](http://www.abdn.ac.uk/wdu016/uploads/files/Impact_Evaluating%20Removal%20of%20Delivery%20fees%20in%20Ghana.pdf). Accessed on 10th February, 2011.

Kawuwa, M.B., Mairiga, A. G. and Usman, H.A. (2007) "Community perspective of maternal mortality: Experience from Konduga Local Government Area, Borno State, Nigeria." *Ann Afr Med*.

Letamo G, Rakgoasi SD. (2003) "Factors associated with the non-use of maternal health services in Botswana." *J Health Popul Nutr*;21:40-47.

Mathiyazhagan, M.K. (2003) "Rural Household Characteristics and Health Expenditure in India an Analysis." *Journal of Social and Economic Development*. 5(1):86.

McCullough, P., and Nelder J. A. (1989). *Generalized Linear Models*. 2d ed. London: Chapman and Hall.

Mckeown, T., Brown, R.G and Record, R.G. (1972) "An Interpretation of the Modern Rise in Population in Europe." *Population Studies*. 26(3): 342-382.

Mrisho, M. et al., (2007) "Factors affecting home delivery in rural Tanzania." *Tropical Medicine and International Health* 12(7):862-872.

Ngom, P., Debpuur, C., Akweongo, P., Adongo, P. and Binka, F.N. (2003) "Gate-keeping and women's health seeking behaviour in Navrongo, Northern Ghana." *Afr J Reprod Health*, (7)1, pp. 17-26.

Nketiah-Amponsah, E and Sagoe-Moses, I. (2009) "Expectant mothers and demand for institutional delivery: Do household income and access to health information matter? Some insight from Ghana." *European Journal of Social Sciences*, 8(3), pp. 469-482/

Opoku O.A. (2009) "Utilization of Maternal Care Services in Ghana by Region after the Implementation of Free Maternal Care Policy." (<http://digitalcommons.hsc.edu/theses/78>)

Ortiz, A.V. (2007) "Determinants of Demand for antenatal care in Colombia," *Health policy*, 86, 363-372.

Osei, I., Garshong, B., Banahene, G. O and Gyapong, J. (2005) "Improving the Ghanaian Safe Motherhood Programme". Health Research Unit, GHS.

Overbosch, et al. (2004) "Determinants of antenatal care use in Ghana." *J Afr Econ* 2004, 13(2):277-301.

Ronsmans C, Scott S, Qomariya SN, Achadi E, Brauholtz D, Marshall T, Pambdi E, Witten KH and Graham WJ. (2009) "Professional assistance during birth and maternal mortality in two Indonesian districts." *Bulletin of the World Health Organization*; 87(5): 405-484.

Rout, H.S. (2006) "Influence of Income and Education on Household Health Expenditure: The Case of Tribal Orissa." *The Orissa Journal of Commerce*, XXVIII(1): 133-144.

Senah, K. A. (2003) "Maternal Mortality in Ghana: The other side." *Research Review NS* 19,1 (2003) 47-55.

Smith, M., Emmanuel O. Tawiah, Delali, M. Badasu. (2012) "Why some women deliver in health institutions and others do not: A cross sectional study of married women in Ghana, 2008." *African Journal of Reproductive Health* September 2012; 16(3): 35.

Thind A, Mohani A, Banerjee K, Hagigi F. (2008) "Where to deliver? Analysis of choice of delivery location from a national survey in India." *BMC Public Health* 2008; 8:29.

Wagstaff, A. (1986) "The Demand for Health: Theory and Applications", *Journal of Epidemiology and Community Health*, 1986;40;1-11doi:10.1136/jech.40.1.1.

WHO, UNICEF, UNFPA. (2004) "Maternal mortality in 2000." Geneva ; 2004

Witter, S., Adjei, S., Armar-Klemesu and Graham, W, (2009) "Providing Free Maternal Health Care; Ten Lessons from an Evaluation of the National Delivery Exemption Policy in Ghana". *Global Health Action*, Vol. 2.

Wong, E.L., Popkin. B.M, Gulley, D.K and Akin, J.S (1987) "Accessibility, Quality of care and Prenatal Care Use in the Philippines." *Social Science and Medicine*, 24:927-944.

World Health Organization. (2004) "Beyond the Numbers: Reviewing maternal deaths and complications to make pregnancy safer." Geneva: World Health Organization.