Maternal and newborn health in Ghana, 2006

1. Introduction

The unacceptably high levels of maternal mortality ratios and under-five mortality in Ghana have attracted much concern about progress towards attainment of the Millennium Development Goals (MGDs) 4 and 5 by 2015. The estimated maternal mortality ratio calculated from maternal deaths identified among the 240,000 households sampled in Phase 1 for the five years preceding the 2007 Ghana Maternal Health Survey was 580 per 100,000 live births (GSS et al., 2009). This high maternal mortality ratio seems to suggest that Ghana has a long way to go to keep women off the road to preventable death. The estimated neonatal mortality from the same survey for the period 2003 through 2007 was 29 deaths per 1,000 live births, while postneonatal mortality was 21 deaths per 1,000 live births. Neonatal deaths account for nearly three out of five infant deaths, while maternal mortality is the second largest cause of female deaths at 14 percent after infectious diseases which account for about 40 percent of deaths to women aged 12-49 years (GSS et al., 2009). The under-five mortality rate of 111 per 1,000 live births for 2006 tells the story of poor health conditions for children in Ghana (Ghana Statistical Service et al., 2007).

The highest proportion of women's ill health burden is related to their reproduction. Universal access to reproductive health care including family planning, care during and after childbirth and emergency obstetric care would reduce unwanted pregnancy, unsafe abortion and maternal death thus saving women's lives and those of their children. Because women comprise more than half of the total population of Ghana the sheer waste of human lives through high maternal mortality constrains human and sustainable development. The importance of women's and children's health is highlighted by MDGs 4 and 5. Goal 4 aims at reducing the under-five mortality by two-thirds between 1990 and 2015. A major indicator is the proportion of one-year old children who have been immunized against measles. With regard to maternal mortality, Goal 5 aims at improving maternal health by reducing the maternal mortality ratio by three-quarters between 1990 and 2015. One important indicator is the proportion of births attended to by health personnel.

The link between maternal and newborn health can hardly be overemphasized. A healthy mother is the first step towards a healthy child. If a mother dies, the foetus or the baby usually dies. Then too, conditions that complicate mother's pregnancy also kill babies. The timing of maternal and newborn deaths are clearly linked with most deaths occurring during delivery. Improving maternal health through qualified antenatal care translates into perinatal health (Ngy et al., 2007). Many studies have found that women's education is strongly associated with positive maternal health outcomes (Tawiah, 1998; Magadi, 2004; Overbosch et. al., 2002; Magadi et. al., 2003; Ram and Singh, 2006).

The paper has two aims: (i) to assess levels of maternal and newborn health and (ii) to examine factors associated with institutional delivery, low birth weight and current use of any contraceptive method.

2. Data and Methods

The 2006 Ghana Multiple Indicator Cluster Survey (MICS) was conducted as part of the United Nations Children Fund MICS programme to fill data gaps and to monitor the situation of children and women through statistically sound, internationally comparable estimates of socio-economic and health indicators. Four sets of questionnaires were used namely, the household questionnaire, the women questionnaire, the men questionnaire and the under-five questionnaire. Module 3 which is one of the 10 modules of the individual women questionnaire focused on maternal and newborn health and collected data from all women with a live birth in the two years preceding the date of interview. It collected information on variables such as receipt of vitamin A dose, antenatal care provider, timing of first antenatal care, number of times of receipt of antenatal care, contents of antenatal care, counselling about HIV/AIDS virus during antenatal visits for pregnancy, HIV/AIDS test, time of HIV/AIDS test, receipt of HIV/AIDS test result, malaria prevention, assistance at delivery of last child, place of delivery, weight of child and breastfeeding. In addition, Module 2 collected data on tetanus toxoid injection from all women with a live birth in the two years preceding the date of interview, while Module 6 collected information on current use of contraception from currently married women or in union.

The sample design for the 2006 MICS was to produce statistically reliable estimates at the national level for urban and rural areas as well as for the 10 regions of Ghana. A more detailed description of the sample design is provided elsewhere (Ghana Statistical Service et al., 2007, pp.128-130). The total number of female respondents aged 15-49 was 5890 and the analysis is based on 1,365 or 23.2 percent of women who gave birth in the preceding two years. The maternal and newborn health indicators are receipt of tetanus toxoid injection during pregnancy, type of antenatal care, type of assistance at delivery, place of delivery, current use of any contraception, use of treated mosquito net, breastfeeding and birth weight.

Descriptive analyses are used to describe inequalities in maternal and child health among regions, socio-economic groups and between rural and urban areas. Logistic regression analyses are employed to examine factors associated with two measures of maternal health namely; place of delivery and current use of any contraception. One aspect of newborn health (low birth weight) is also examined. The results of the logistic regression analyses are given as regression coefficients, odds ratio (if greater than unity, the probability of current use of any contraception, for example, is higher than that of non-use of any contraception), and p values, to assess the relative statistical significance of the selected variables.

3. Results

Receipt of vitamin A dose

Vitamin A supplementation to mothers who are breastfeeding helps not only to protect their children during the first months of life but also to replenish the mother's store of vitamin A which depleted during pregnancy and lactation. Respondents were

asked whether they had received a vitamin A dose in the first two months after their last birth. Table 1 shows the percentage of mothers who received vitamin A supplementation. One out of every two mothers received vitamin A supplement. While 64.9 percent of urban mothers received vitamin A supplementation, the corresponding percentage for rural mothers was 49.1. There are variations in vitamin A supplement by region. Ashanti region recorded the highest percentage (67.9 percent) followed by Western (66.3 percent), Greater Accra (64.7 percent) and Volta (64.6 percent). Eastern and Northern regions are the most disadvantaged regions.

Table 1 about here

Figure 1 shows that six out of 10 children aged 6-59 months received vitamin A supplement in the six months prior to the survey. There are regional differences in vitamin A supplementation ranging from 33.4 percent in the Greater Accra region to 75.9 percent in the Brong Ahafo region. Children in rural areas are more likely to receive vitamin A supplementation. The percentage of children who never received vitamin A supplementation is 7.2. It varies from 3.5 percent in the Greater Accra region to 12 percent in the Upper East region (figures not shown).

Figure 1 about here

Antenatal care provider

Antenatal care (ANC) is a major component of safe motherhood. Its potential as an intervention to improve both maternal and newborn health can hardly be overstressed. Respondents were asked whether they had seen anyone for antenatal care for their last pregnancy and if so the type of person who provided that care, the timing of first antenatal care and frequency of antenatal care. Table 2 shows that the level of antenatal care is high. The percentage of pregnant women who received ANC care one or more times is 94.5 (figure not shown). Antenatal care was provided to two out of every three births by nurse/midwife/auxiliary midwife, while doctors provided antenatal care to 23.3 percent of births. Six percent of births did not receive antenatal care. It is noted that more than half of births in each region received antenatal care from nurse/midwife/auxiliary midwife. Upper West region registered the highest percentage while Greater Accra region has the lowest percentage of births receiving antenatal care from nurse/midwife/auxiliary midwife.

Antenatal care provided by doctors varies according to region of residence. As expected, Greater Accra and Ashanti regions which have more than their fare share of health facilities also have the highest percentages of doctors providing antenatal care. The three northern regions namely, Northern, Upper East and Upper West trail behind the other regions in terms of antenatal care provided by doctors. Provision of antenatal care varies by type of place of residence. Rural women are more likely to receive antenatal care from nurse/midwife/auxiliary midwife than their urban counterparts, while the reverse is the case for doctors. The proportion of births which did not receive any antenatal care varies from 1.4 percent in the Upper West region to 10.5 percent in the Volta region.

Table 2 about here

Contents of antenatal care

In order to assess the quality of care during pregnancy, the 2006 MICS included a series of questions on contents of antenatal care. Respondents were asked whether they were weighed, had their blood pressure measured and had their urine and blood tested. Table 3 shows the percentage of women according to extent of care given to them during their antenatal care visits. More than 90 percent of women had their blood pressure checked and weight measured. Eighty percent had their urine specimen test and 78.3 percent had their blood sample taken for laboratory examination.

Regional differences in the level of antenatal care are more noticeable for blood sample taken for laboratory examination. The percentage of pregnant women who had their blood sample taken varies from 46.3 in the Northern region to 93.9 in the Brong Ahafo region. This is largely due to differences in availability of laboratory facilities for testing blood samples. The four indicators of "quality" of ANC seem to suggest that women in Brong Ahafo region have relatively higher quality of antenatal care than their counterparts in the other nine regions. The level of quality of ANC is higher among urban than rural women. The percentage of women is more than 90 percent for urban women for each of the content of ANC.

Table 3 about here

Tetanus toxoid injection coverage

One of the strategies to protect the newborn against neonatal tetanus, an important cause of death among infants, is to ensure that all pregnant women receive at least two doses of tetanus toxoid vaccine. Respondents with a live birth in the two years preceding the survey were asked whether during pregnancy they had received any injection to prevent him or her from getting tetanus. The percentage of women who have received one dose of tetanus toxoid vaccine was 2.2, while the corresponding value for women who have received any tetanus toxoid injection was 86.7 percent (figures not shown). In general, the level of protection against tetanus is high among mothers. Table 4 shows that 63.8 percent of mothers received at least two doses of tetanus toxoid vaccine during the last pregnancy. The level of tetanus protection varies from 47.8 percent in the Volta region to 70.9 percent in the Central region. Urban mothers are 1.1 times more likely to have received tetanus toxoid vaccine than their rural counterparts.

Table 4 about here

Vaccination coverage

Figure 2 shows the percentage of children aged 12-23 months who received the recommended vaccinations by 12 months by sex, region and type of place of residence. It is seen that more than seven out of 10 children have received all the required vaccinations although this is far short of the 90 percent goal of *A World Fit for Children*. There is no variation by sex in terms of having all the required vaccinations. Upper West region registered the highest percentage (86.5), while the smallest percentage is for children from the Volta region (55.7). Children in urban

areas are more likely to have received all the required vaccinations than their rural counterparts.

Figure 2 about here

Malaria prevention

Malaria is and continues to be a major public health concern. It is one of the leading causes of morbidity and mortality particularly among pregnant women and children under five years. Malaria is estimated to account for a quarter of deaths among children under five years (Ghana Health Service, 2001). One of the personal protective measures to reduce malaria transmission and morbidity is the use of both treated and untreated mosquito nets. Respondents were asked whether they slept in treated mosquito net during pregnancy. The use of treated mosquito net is low. Table 5 shows that three out of 10 women slept in treated mosquito nets. The high level of mosquito net use in the Volta region may be partly due to the customary practice whereby relatives give mosquito net to the mother during the naming ceremony of a child. Rural women are more likely to use treated mosquito nets than urban women.

The 2006 MICS data show that 32.6 percent of children under five years slept under any mosquito net the night preceding the survey and 21.8 percent slept under insecticide mosquito net. The use of treated mosquito net among children under five years varies by type of place of residence, region, and age of the child and wealth quintile. Rural children are 1.5 times as likely to sleep under a treated mosquito net the previous night as urban children (figures not shown).

Data from the National Malaria Control Programme show that both the public and private sectors distributed 8,282,656 insecticide treated nets (ITNs) in 2006 compared with 1,653,866 and 2,662,298 in 2005 and 2007 respectively. It is worth mentioning that the higher level of ITN use by pregnant women and children under five years in rural than urban areas is a reflection of the distribution network which tended to favour rural areas.

Table 5 about here

Assistance at delivery

The type of person who provides assistance at delivery has serious implications for the fight against excessive maternal mortality. This is because trained health professionals are better equipped with skills to be more able to cope with pregnancy and delivery complications than non-professional health staff. Almost half of the women received assistance during delivery from trained health professionals, while trained and untrained traditional birth attendants accounted for 31 percent. Relatives and friends provided delivery assistance to 15.3 percent of the women. In view of the prevailing excessive maternal mortality, it is crucial for health planners and managers to endeavour to reduce the proportion of relatives and friends providing assistance during delivery to the barest minimum. This will be in line with the attainment of MDG 5.

As expected, doctors featured prominently in Greater Accra (28.7 percent) and Ashanti (14.5 percent), the two regions with the largest share of medical practitioners in Ghana. It is noted that Upper West and Volta stand out as the regions in which relatives and friends provided assistance during delivery to more than three out of 10 women.

The disadvantage experienced by rural women is amply shown in Table 6. Whereas 67 percent of urban women were provided with delivery assistance by trained health professionals, the corresponding value for rural women is 35.4 percent. Almost 20 percent of rural women received assistance during delivery from relatives and friends compared with 6.4 percent for urban women.

Table 6 about here

Place of delivery

Table 7 shows place of delivery of women aged 15-49 who gave birth in the two years prior to the survey. Thirty eight percent of the women have their delivery in a public health facility compared to 10.8 percent of women whose delivery took place in a private health facility. In other words, women are 3.5 times more likely to deliver in a public than private health facility. It is noteworthy that half of the women delivered at home where it is most likely that delivery assistance would be given by relatives and friends whose delivery skills may be suspect.

The percentage of women delivering at a public health facility varies from 28.1 in the Upper East region to 56.0 in the Greater Accra region. All the regions except Greater Accra, Ashanti and Brong Ahafo have percentages of women delivering at a public health facility which are less than the national value of 37.7 percent. There are regional differences in terms of home delivery. In the Upper West region, seven out of 10 women delivered at home compared to 16.3 percent of women in Greater Accra region. Having more than half of deliveries taking place at home in seven of the 10 regions points to the difficulty that has to be overcome in order to keep women off the road to preventable death. An analysis of the wealth index quintiles by place of delivery shows that a total of 67 percent comprising the poorest (35.1 percent) and the second poorest (31.9 percent) women delivered at home (figures not shown). It is most likely that the Ghana government's policy of providing free maternal health service in public health facilities initiated in July 2008 will begin to yield dividends and thereby contribute towards the eventual elimination of home delivery.

A further analysis to examine the relationship between antenatal care attendance and later attendance at an institutional facility to give birth shows that mothers who received ANC are more likely to deliver at an institutional facility than mothers who did not receive ANC. Fifty three percent of mothers who received ANC from health professionals delivered at an institutional facility compared with 22.2 percent and 17.7 percent respectively for mothers who received antenatal care from birth attendants and those who did not receive any ANC (figures not shown).

Table 7 about here

Breastfeeding status

Barring any delivery complications the health and survival of the newborn depends on the quality of care given to the newborn during the first few hours of life. In spite of a number of methodological limitations of study design, definitions and measurement problems, most of the articles reviewing the data on the link between breastfeeding and child health and survival provide convincing evidence of the health benefits of breastfeeding (Feacham and Koblinski; 1984; Jason et al., 1984; Anderson et al., 1984). The colostrum, milk secreted mainly during the first five post-partum days contains a high level of antibody rich protein, especially secretory immunologlobulin A and lactoferrin which offer anti-infection protection to the newborn (Shah and Khanna, 1990; GSS et al., 2004).

Table 8 provides information on the percentage of women who breastfed their baby within one hour of birth and within one day of birth by region and urban-rural residence. A little over one out of three women (35.2 percent) initiated breastfeeding within one hour of birth. Early initiation of breastfeeding varies according to region of residence. The proportion of infants who were breastfed within one hour of birth varies from 17.3 percent in the Eastern region to 46.3 percent in the Greater Accra region. A higher proportion of urban than rural females initiated breastfeeding within one hour of birth, 39 percent compared with 33 percent. Upper West region has the lowest proportion of infants who were breastfed within one day of birth compared with a much larger percentage (83.2 percent) of infants in the Upper East region. The rural-urban pattern for breastfeeding within one day of birth is the same as that of breastfeeding within one hour of birth.

Table 8 about here

The World Health Organization (WHO) recommends that children should be exclusively breastfed for six months and continue to be breastfed with safe, appropriate and adequate complementary feeding for up to five years of age and beyond. Table 9 shows that almost two out of three living children aged zero to three months were exclusively breastfed. A higher percentage of female than male living children aged zero to three months were exclusively breastfed. The percentage of children who were exclusively breastfed for six months is 54.4 which is almost the same as the percentage (53.4) for 2003 (GSS et al., 2004). A higher percentage of urban children aged zero to three months, zero to five months and six to nine months were breastfed than their rural counterparts. The reverse is the case for children aged 12-15 months and 20-23 months.

Table 9 about here

Weight at birth

Birth weight is a good indicator not only of a mother's health and nutritional status but also the newborn's chances of survival, growth, long-term health and psychological development (GSS et al., 2007). Low birth weight (less than 2,500 grams) makes a child more susceptible to a range of health risks. It is a leading cause of poor infant survival and development (Vannucci and Vannucci, 2001). Low birth

weight infants need special care which may not be available especially when delivery takes place at home.

The 2006 MICS used two approaches to collect information on child's weight at birth. Respondents were asked whether they thought when their last child was born he/she was very large, larger than average, average, smaller than average or very small. The second approach asked respondents whether the last child was weighed and if so, how much did the child weigh. Based on the mother's assessment of child's size at birth, Table 10 shows that 36.1 percent were weighed at birth and 9.1 percent of infants were estimated to weigh less than 2,500 grams at birth. It must be stated that because many infants are not weighed at birth and those who are weighed may be a biased sample of all births, the reported birth weights cannot be used to estimate the prevalence of low birth weight among all children (GSS et al., 2007).

There are no significant variations in low birth weight according to region and type of place of residence. Central region has the lowest percentage of live births weighed at birth (19.2 percent), while Greater Accra region has the largest percentage of 74.3. Urban births are 2.4 times more likely to be weighed at birth than rural births. This is not unexpected because of the lopsided distribution of health facilities to the detriment of rural areas.

Table 10 about here

Current contraceptive use

Excessive childbearing predisposes women to greater risk of death particularly in situations where births are delivered at home and without assistance from trained health professional staff. An appropriate family planning is important to the health of mother and child by preventing pregnancies that are too early, too closely spaced, too late or too many. Contraceptive use is low as shown in Table 11. Seventeen percent of mothers were using any contraceptive method. Use of contraception was lower in the Upper West region (15.4 percent) and highest in the Greater Accra region (27.3 percent). The percentages of mothers using any contraceptive method in Upper West, Upper East, Volta and Western regions are smaller than the national average figure of 16.8 percent that is also lower than the 2003 Ghana Demographic and Health Survey value of 20.7 percent for any contraceptive method for all women. Urban women are 1.8 times more likely to use any contraceptive method compared with rural women (13.3 percent). The corresponding value for any modern method is 1.4 times.

Table 11 about

Predictors of institutional delivery

Using the ENTER method, three logistic regression models were run to examine the relationship between the independent variables (region, type of place of residence, level of education, religion, age at first birth and wealth index quintile) and institutional delivery, low birth weight and current use of any contraception as the dependent variables. Table 12 shows that type of place of residence, level of education and wealth index quintiles are the significant predictors of institutional delivery. Compared with urban women, rural women are less likely to deliver in an

institutional facility. Women with primary education are 1.7 times more likely to have delivered in an institutional facility compared with uneducated women. In the case of women with secondary and over education, the odds ratio is as high as 3.4. Wealth index quintiles which are used here as an indicator of household wealth shows that there is a significant association between wealth index quintile and institutional delivery. Women in the richest households are 8.7 times more likely to deliver in an institutional facility after adjusting for region of residence, type of place of residence, level of education, religion and age at first birth compared to women from the poorest households. Until July 2008, pregnant women had to pay for delivery services at public health facilities. Inability to pay for delivery services at public health facilities will tend to deter women from using those services.

Table 12 about here

Predictors of low birth weight

Table 13 presents the predictors of low birth weight. Northern region is associated with a reduced risk of low birth weight with reference to Greater Accra region. This may be due in part to the small variations observed among the regions in the bivariate analysis (see Table 10). Women with middle/JSS education experience an increased risk of low birth weight compared with uneducated women. Muslim women are four times more likely to experience increased risk of low birth weight after adjusting for the influence of region, type of place of residence, level of education, religion, age at first birth and wealth index quintiles (OR = 3.99; 95% CI: 1.437-11.084) compared with Christian women. Women who profess to be spiritualists are 4.7 times more likely to have increased risk of low birth weight compared with Christian women.

A model was run to examine the relationship between use of antenatal care and low birth weight. The model did not perform well because the level of antenatal care is high (94.5 percent) in Ghana and a small proportion of infants (9.1 percent) were estimated to weigh less than 2,500 grams.

Table 13 about here

Predictors of current use of any contraceptive method

Table 14 shows that women in Greater Accra region are 2.4 times more likely to use any contraceptive method than women in the Northern region although this is not significant. This is not surprising because Greater Accra is the most urbanised region with an unfair share of health facilities. Christian women are six times (odds ratio, 6.2) more likely to use any contraceptive method compared with Muslim women. The odds ratio for Catholic mothers is 2.0 but it is insignificant. A significant relationship between women in richest households and current use of any contraceptive method was observed. Women from the richest households are eight times more likely to use any contraceptive method as compared to women from the poorest households.

Table 14 about here

4. Summary and discussion

The paper has attempted to assess levels of maternal and newborn health as well as examine factors associated with institutional delivery, low birth weight and current use of any contraception. Vitamin A supplementation is quite high for both children and mothers. Six out of 10 children aged 6-59 months received vitamin A supplement in the six months prior to the survey, while among mothers it is one out of every two mothers. The percentage of pregnant women who received ANC care one or more times is 94.5 and nurse/midwife/auxiliary midwife provided antenatal care to two out of every three births. The level of protection against tetanus is high among mothers. Sixty four percent of mothers received at least two doses of tetanus toxoid vaccine during the last pregnancy. Vaccination coverage is high among children aged 12-23 months. The study found that seven out of 10 children have received all the required vaccinations although this falls short of the 90 percent goal of *A World Fit for Children*.

One important finding from this study is the high prevalence of home delivery among pregnant women. Home delivery accounted for one out of every two births and this makes the battle against excessive maternal mortality a herculean one. Coupled with this problem is the issue of relatives and friends providing assistance at delivery to 15.3 percent of the women. The results show that the odds of institutional delivery are significantly higher for women from the richest households than for women from the poorest households. The Ghana government's "policy" of free maternal delivery services at public health facilities initiated in July 2008 will do the trick particularly for urban women because of availability of relatively more public health facilities. The need to expand public health facilities to cover the rural areas can hardly be overemphasized.

The percentage of children aged 0-5 months who were exclusively breastfed is 54.4. The Ghana Infant Nutrition Action Network in collaboration with the Ministry of Health and the Ghana Health Service organises the yearly World Breastfeeding Week celebration during every first week of August. The yearly celebration should be extended to cover the rural areas where majority of the people live. The Ministry of Health should sensitise women on the importance of breastfeeding as a live-saving intervention during emergencies. In addition, the Ministry of Health and the Ghana Health Service should create and sustain an environment that encourages and supports regular breastfeeding for children up to two years of age.

It should be mentioned that at the heart of maternal health are socio-political conditions, laws, conventions, traditions, customs, religion, superstition etc. This study has examined some demographic and socio-economic factors that influence maternal and child health outcomes. Higher female education is associated with favourable health outcomes as has been found in other studies (Letamo and Majelantle, 2001; Ngy et al., 2007).

A few policy implications flow from this study. All women should be encouraged by the Ministry of Health and the Ghana Health Service to deliver at an institutional facility. Although the level of antenatal care is high in Ghana all women should attend antenatal services because these services serve as the central pathway through which the socio-economic conditions and the reproductive health behaviour of women

operate to influence birth outcome. Higher female education is good in its own right apart from its positive influence on health outcomes. The Ministry of Health should ensure that the Ghana government's free maternal delivery services policy translates into effective action.

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Table 1. Percentage of women aged 15-49 years with a birth in the two years preceding the survey who received a high dose vitamin A supplement before the infant was eight weeks old by region and type of place of residence, Ghana 2006.

Characteristic	Received vitamin A supplement	Not sure if received vitamin A supplement
Region		
Western	66.3	0.0
Central	49.1	0.5
Greater Accra	64.7	1.2
Volta	64.6	0.0
Eastern	36.4	0.0
Ashanti	67.9	0.7
Brong Ahafo	60.8	1.3
Northern	38.0	3.3
Upper East	56.3	1.3
Upper West	60.1	0.0
Type of place of residence		
Urban	64.9	0.9
Rural	49.1	1.2
Total	54.5	1.1

Table 2. Percentage distribution of women aged 15-49 gave birth in the two years preceding the survey by antenatal care provider according to region and type of place of residence, Ghana 2006

Characteristic	Person providing antenatal care					
	Doctor	Nurse/midwife auxiliary midwife	Traditional birth attendant	Community health worker	No one	Total
Region						
Western	28.2	61.5	3.6	4.6	2.0	100.0
Central	21.0	17.7	0.0	3.1	4.1	100.0
Greater Accra	41.7	52.0	0.0	0.9	5.3	100.0
Volta	17.4	68.3	0.0	1.9	10.5	100.0
Eastern	30.7	60.6	0.9	0.0	7.8	100.0
Ashanti	32.7	64.8	0.6	0.3	1.7	100.0
Brong Ahafo	12.2	82.3	3.5	0.0	2.0	100.0
Northern	10.9	78.7	0.9	0.0	9.4	100.0
Upper East	2.6	88.4	0.0	1.0	8.0	100.0
Upper West	5.3	90.8	0.0	1.7	1.4	100.0
Type of place of residence						
Urban	33.9	62.1	1.2	0.0	2.8	100.0
Rural	17.8	72.4	1.0	1.7	7.0	100.0
Total	23.3	68.8	1.0	1.1	5.5	100.0

Note: Relative/friend/other/missing comprise 0.1 percent.

Table 3. Percentage of pregnant women according to contents of antenatal care by region and type of place of residence, Ghana 2006

Characteristic	Percentage of pregnant women who had: Blood sample taken	Blood pressure measured	Urine specimen taken	Weight measured
Region				
Western	88.4	92.0	90.6	90.7
Central	85.1	92.9	86.8	92.6
Greater Accra	92.5	93.8	94.0	92.1
Volta	67.8	83.3	69.7	85.8
Eastern	87.1	90.9	89.5	85.1
Ashanti	90.0	96.5	95.0	95.7
Brong Ahafo	93.9	98.0	96.5	98.0
Northern	46.3	87.9	48.0	87.5
Upper East	69.9	88.8	60.5	91.3
Upper West	66.5	97.7	59.1	97.6
Type of place of residence				
Urban	91.0	94.9	92.3	94.4
Rural	71.7	90.4	73.5	89.0
T o t a l	78.3	91.9	80.0	90.9

Table 4. Percentage of mothers with a live birth in the lat two years protected Against Neonatal tetanus, Ghana 2006

Characteristic	Received at least two doses during last pregnancy	Received at least two doses, the last within prior three years	Number of women
Region			
Western	69.6	18.6	144
Central	70.9	8.3	105
Greater Accra	68.6	15.6	167
Volta	47.8	10.8	97
Eastern	53.4	15.4	182
Ashanti	63.0	11.3	207
Brong Ahafo	61.2	14.7	107
Northern	69.5	7.5	260
Upper East	66.5	13.0	58
Type of place of residence			
Urban	67.1	13.6	468
Rural	62.1	11.9	897
Total	63.8	12.5	1,365

Source: Ghana Statistical Service et al., 2007, Table CH.3, page 35.

Table 5. Percentage of women who slept under treated net during pregnancy by region and type of place of residence, Ghana 2006

Characteristic	Yes	No
Region		
Western	16.2	83.8
Central	19.0	81.0
Greater Accra	15.2	84.8
Volta	50.0	50.0
Eastern	28.6	71.4
Ashanti	29.9	70.1
Brong Ahafo	42.9	57.1
Northern	40.4	59.6
Upper East	45.3	44.7
Upper West	51.4	48.6
Type of place of residence		
Urban	24.6	75.4
Rural	34.9	65.1
Total	31.2	68.8

Table 6. Percentage distribution of women aged 15 – 49 with a birth in the two years preceding the survey by person providing assistance during delivery by region and type of place of residence, Ghana 2006

Characteristic	Doctor	Nurse/ midwife	Trained traditional birth attendant	Untrained traditional birth attendant	Relative/ friend	No Attendant	Other missing	Total
Region								
Western	2.0	37.6	42.3	9.2	5.8	2.3	0.7	100.0
Central	5.9	37.7	35.1	7.1	8.7	3.6	1.0	100.0
Greater Accra	28.7	54.3	3.7	1.0	8.8	3.6	0.0	100.0
Volta	9.6	35.0	7.0	8.2	31.0	5.0	4.2	100.0
Eastern	8.3	30.5	26.5	16.0	15.4	3.3	0.0	100.0
Ashanti	14.5	46.0	23.5	6.6	6.7	2.8	0.0	100.0
Brong Ahafo	4.1	54.0	1.1	4.9	10.7	5.2	0.0	100.0
Northern	1.0	37.1	16.1	17.7	26.0	0.6	1.6	100.0
Upper East	2.2	41.8	17.3	10.8	19.8	2.2	5.8	100.0
Upper West	4.0	25.1	27.1	1.6	38.4	0.6	3.2	100.0
Type of place of residence								
Urban	19.6	57.4	10.2	3.1	6.4	2.8	0.5	100.0
Rural	3.3	32.2	27.2	13.0	19.9	2.8	1.5	100.0
Total	8.9	40.8	21.4	9.6	15.3	2.8	1.1	100.0

Table 7. Percentage distribution of women aged 15 – 49 who gave birth in the two years preceding the survey according to place of delivery by region and rural-urban place of residence, Ghana 2006

Characteristic	Health facility		Home	Other	Missing	Total
	Public sector	Private sector				
Region						
Western	30.1	9.6	60.3			100.0
Central	33.3	12.4	52.4	1.9		100.0
Greater Accra	56.0	27.1	16.3		0.6	100.0
Volta	34.7	7.1	56.2	2.0		100.0
Eastern	31.7	7.7	58.4	2.2		100.0
Ashanti	43.5	16.3	40.2			100.0
Brong Ahafo	44.4	13.0	42.6			100.0
Northern	33.7	0.8	65.1	0.4		100.0
Upper East	28.1	14.0	56.2		1.7	100.0
Upper West	28.9		71.1			100.0
Type of place of residence						
Urban	56.6	20.3	22.2	0.4	0.4	100.0
Rural	27.9	6.0	65.2	0.8	0.1	100.0
Total	37.7	10.8	50.6	0.7	0.2	100.0

Table 8. Percentage of women aged 15 – 49 years with birth in the two years preceding the survey who breastfed their baby within one hour and within one day of birth by region and type of place of residence, Ghana 2006

Characteristic	Percentage who started breastfeeding within one hour of birth	Percentage who started breastfeeding within one day of birth	Number of women with a live birth in the two years preceding the survey
Region			
Western	43.4	72.3	144
Central	39.4	79.7	105
Greater Accra	46.3	80.2	167
Volta	19.9	68.3	97
Eastern	17.3	74.9	182
Ashanti	14.9	65.5	207
Brong Ahafo	25.0	63.0	107
Northern	45.0	75.2	260
Upper East	36.4	83.2	58
Upper West	28.5	46.6	37
Type of place of residence			
Urban	39.1	77.9	468
Rural	33.1	69.6	897
Total	35.2	72.5	1,365

Table 9. Percentage of living children according to breastfeeding status at each age group by sex and type of place of Residence, Ghana 2006

Characteristic	Children 0-3 months		Children 0-5 months		Children 6-9 months		Children 12-19 months		Children 20-23 months	
	Percent exclusively breastfed	Number of children	Percent exclusively breastfed*	Number of children	Percent receiving breastmilk solid/mushy food**	Number of children	Percent breastfed ***	Number of children	Percent breastfed ***	Number of children
Sex										
Male	64.2	113	52.8	202	63.5	125	96.6	112	55.4	106
Female	65.9	106	56.1	181	53.0	107	92.6	121	56.7	116
Type of place of residence										
Urban	68.4	89	59.9	148	66.3	73	85.6	70	34.2	72
Rural	62.7	130	50.9	135	55.2	159	98.4	163	66.6	150
Total	65.0	219	54.4	383	58.7	232	94.6	233	56.1	222

Source: Ghana Statistical Service et al., 2007, Table NU.3 page 22.

* Exclusive breastfeeding rate.

** Timely complementary feeding rate.

*** Continued breastfeeding rate at 12-15 months and at 20-23 months

Table 10. Percentage of live births in the two years preceding the survey that weighed below 2,500 grams at birth by region and type of place of residence, Ghana 2006

Characteristic	Percent of live births		Number of live births
	Below 2,500 grams*	Weighed at birth**	
Region			
Western	10.4	34.3	144
Central	7.9	19.2	105
Greater Accra	9.3	74.3	167
Volta	9.5	30.6	97
Eastern	10.1	23.8	182
Ashanti	8.5	40.6	207
Brong Ahafo	7.6	36.8	107
Northern	9.0	27.8	260
Upper East	9.9	38.9	58
Upper West	8.8	20.4	37
Type of place of residence			
Urban	9.2	58.6	468
Rural	9.1	24.4	897
Total	9.1	36.1	1,365

Source: Ghana Statistical Service et al., 2007, Table NU.8, page 30.

* Based on mother's assessment of child's size at birth.

** Based on mother's recall of child's weight or the weight as recorded on a health card if the child was weighed at birth.

Table 11. Percentage of women aged 15-49 with a birth in the two years preceding the survey who are using a contraceptive method, Ghana 2006

Characteristic	Not using any method	Any modern method	Any traditional method	Total	Any method	Number of women
Region						
Western	89.6	9.7	0.7	100.0	10.4	144
Central	75.0	18.3	6.7	100.0	25.0	105
Greater Accra	72.7	12.1	15.2	100.0	27.3	167
Volta	86.6	12.4	1.0	100.0	13.4	97
Eastern	82.5	15.3	2.2	100.0	17.5	182
Ashanti	77.5	20.2	3.3	100.0	23.5	207
Brong Ahafo	78.5	21.5	0.0	100.0	21.5	107
Northern	93.5	6.5	0.0	100.0	6.5	260
Upper East	87.9	12.1	0.0	100.0	12.1	58
Upper West	94.6	5.4	0.0	100.0	5.4	37
Type of place of residence						
Urban	76.7	16.9	6.4	100.0	23.3	468
Rural	86.7	11.7	1.6	100.0	13.3	897
Total	83.2	13.5	3.3	100.0	16.8	1,365

Table 12. Logistic regression of institutional delivery by selected characteristics of women, Ghana 2006

Characteristic	Logistic coefficient	Odds ratio		95% CI
Region				
Western	-0.788	0.455		
Central	-0.277	0.758		
Greater Accra	-0.070	0.933		
Volta	-0.126	0.882		
Eastern	-0.505	0.603		
Ashanti	-0.247	0.781		
Brong Ahafo	0.053	1.055		
Northern RC		1.000		
Upper East	0.640	1.896		
Upper West	-0.275	0.759		
Type of place of residence				
Urban RC		1.000		
Rural	-0.837	0.433	***	0.301-0.623
Level of education				
No education RC		1.000		
Primary	0.537	1.710	**	1.150-2.544
Middle/JSS	0.863	2.369	***	1.618-3.470
Secondary+	1.218	3.382	***	1.632-7.009
Religion				
Catholic	-0.031	0.969		
Christian	0.096	1.101		
Moslem RC		1.000		
Traditional	-0.744	0.475	*	0.257-0.881
Spiritualist	-0.852	0.427	*	0.187-0.973
Age at first birth				
14-19	0.391	1.479		
20-24	0.114	1.120		
25-29 RC		1.000		
30-34	0.037	1.038		
35-52	0.339	1.404		
Wealth index quintiles				
Poorest RC		1.000		
Second	0.262	1.300		
Middle	0.561	1.753	*	1.127-2.727
Fourth	1.490	4.436	***	2.706-7.272
Richest	2.166	8.723	***	4.426-17.193
Constant -0.577		Nagelkerke R^2		0.379
Model X^2 426.023		Df 25		

* p< 0.05, ** p< 0.01, *** p< 0.001

Table 13. Logistic regression of low birth weight by selected characteristics of women, Ghana 2006

Characteristic	Logistic coefficient	Odds ratio		95% CI
Region				
Western	-0.937	0.392		
Central	-2.017	0.133		
Greater Accra RC		1.000		
Volta	-0.961	0.382		
Eastern	-0.510	0.600		
Ashanti	-0.453	0.636		
Brong Ahafo	-0.652	0.521		
Northern	-1.781	0.168	*	0.029-0.971
Upper East	-0.606	0.546		
Upper West	-1.193	0.303		
Type of place of residence				
Urban RC		1.000		
Rural	0.175	1.192		
Level of education				
No education RC		1.000		
Primary	1.004	2.728		
Middle/JSS	1.275	3.580	*	1.179-10.870
Secondary+	0.336	1.400		
Religion				
Catholic	0.901	2.461		
Christian RC		1.000		
Moslem	1.384	3.992	**	1.437-11.084
Traditional	-0.249	0.780		
Spiritualist	1.543	4.678	**	1.385-15.802
Age at first birth				
14-19	-0.387	0.679		
20-24	0.155	1.168		
25-29 RC		1.000		
30-34	-0.179	0.836		
35-52	-0.612	0.542		
Wealth index quintiles				
Poorest	- 0.592	0.553		
Second	0.137	1.147		
Middle	0.403	1.497		
Fourth	0.133	1.142		
Richest RC		1.000		
Constant -4.161		Nagelkerke R^2		0.114
Model X^2 35.398		Df 25		

* p< 0.05, ** p< 0.01.

Table 14. Logistic regression of current use of any contraception by selected characteristics of women, Ghana 2006

Characteristic	Logistic coefficient	Odds ratio		95% CI
Region				
Western	-0.021	0.980		
Central	0.399	1.490		
Greater Accra	0.883	2.419		
Volta	0.261	1.298		
Eastern	-0.248	0.780		
Ashanti	-0.079	0.924		
Brong Ahafo	-0.242	0.785		
Northern RC		1.000		
Upper East	0.410	1.506		
Upper West	0.510	1.163		
Type of place of residence				
Urban RC		1.000		
Rural	0.589	1.803		
Level of education				
No education RC				
Primary	-0.196	0.822		
Middle/JSS	-0.784	0.457		
Secondary+	0.560	1.751		
Religion				
Catholic	0.710	2.033		
Christian	1.644	6.174	*	1.303-20.649
Moslem RC		1.000		
Traditional	-0.297	0.743		
Spiritualist	-0.181	0.834		
Wealth index quintiles				
Poorest RC		1.000		
Second	0.311	1.365		
Middle	1.053	2.865		
Fourth	1.002	2.723		
Richest	2.131	8.427	*	1.532-46.364
Age at first birth	-0.004	0.996		
No. of living children	-0.119	0.888		
Constant -3.049		Nagelkerke R^2		0.220
Model X^2 41.710		Df 23		

* $p < 0.05$

Figure 1. Percentage of children aged 6-59 months who received a high dose of vitamin A supplement in the last six months by sex, region and type of place of residence, Ghana 2006

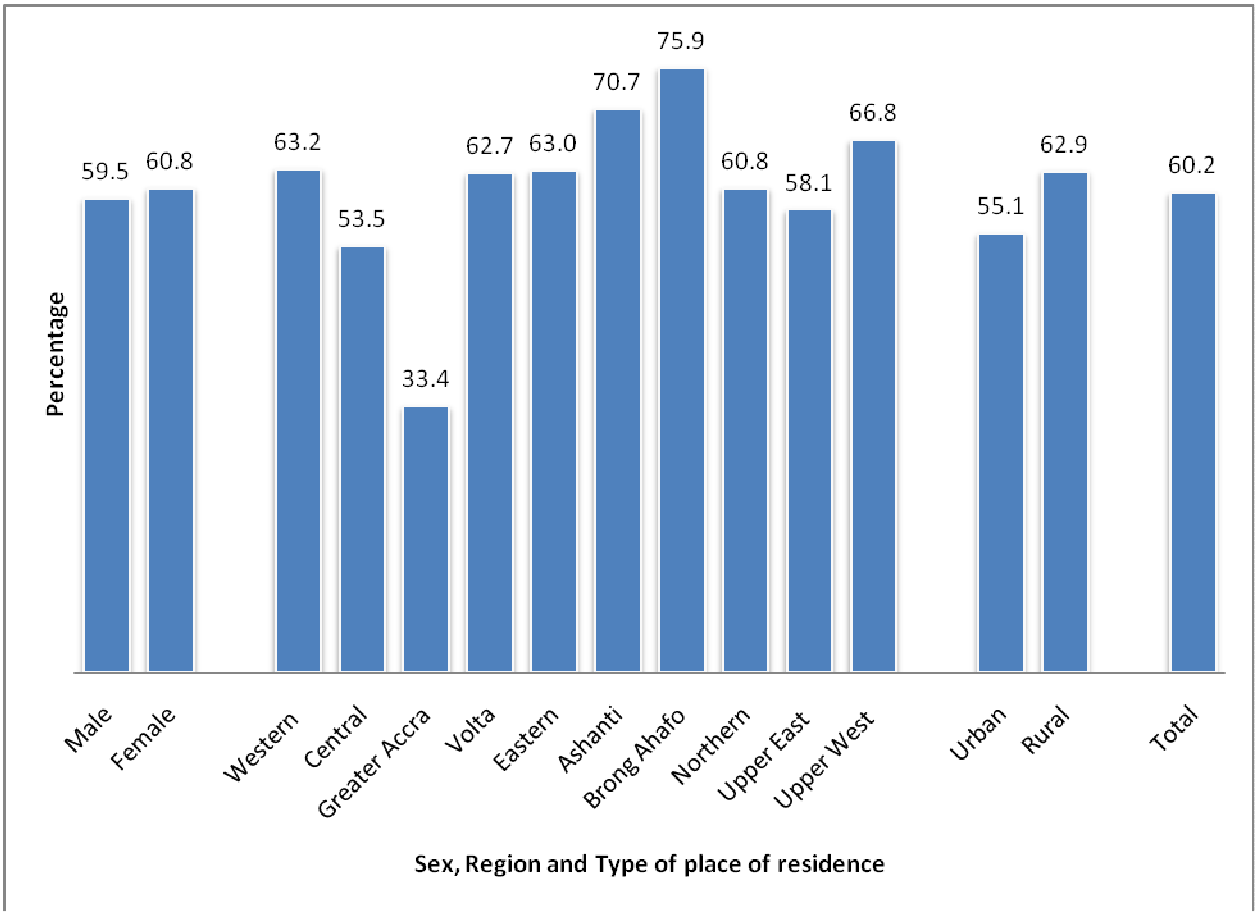

Figure 2. Percentage of children aged 12-23 months who received the recommended vaccinations by sex, region and type of place of residence, Ghana 2006