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**EVALUATION OF THE ANAEMIA IN PREGNANCY PROGRAM IN EJISU-
JUABEN MUNICIPALITY**

**BY
REUBEN BEDZRAH**

**A DISSERTATION SUBMITTED IN PART FULFILLMENT FOR THE
AWARD OF THE MASTER OF PUBLIC HEALTH (MPH) DEGREE**

INTEGRI PROCEDAMUS

OCTOBER 2008

DECLARATION

I Reuben Bedzrah, declare that except for the other people's investigations which have been duly acknowledged, this work is the result of my own original research and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

.....
REUBEN BEDZRAH
(STUDENT/PRINCIPAL INVESTIGATOR)

.....
DR. FEDERICK WURAPA
(ACEDMIC SUPERVISOR)

.....
DR. MOSES ADIBO
(ACEDMIC SUPERVISOR)



DEDICATION

This work is dedicated to my wife, Monica Dela Bedzrah and my children, Rubby, Florence and Justice Bedzrah for their love and spiritual support which motivated me to complete this work.



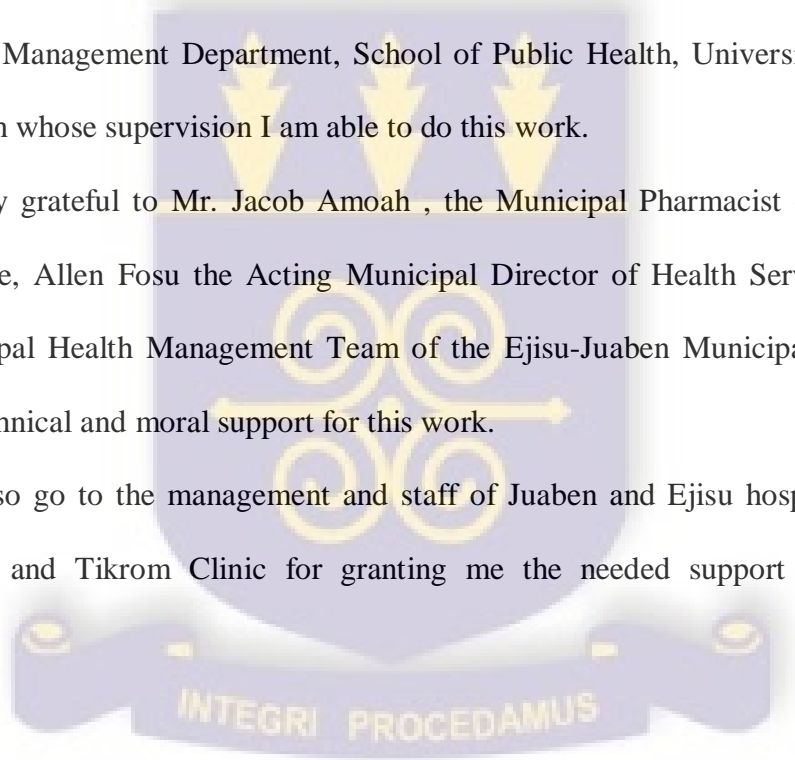
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ABSTRACT

Anaemia in pregnancy has a serious implication on the achievement of the Millennium Development Goals (MDGs) 4 and 5. In 2004, the Ghana Health Service launched the Integrated Strategy for Control of Anaemia in Ghana to reduce the prevalence of anaemia among pregnant women.

The objective of the study was to evaluate the effectiveness of the program in Ejisu-Juaben Municipality of Ashanti Region

The study which was a cross-sectional study reviewed data from ANC registers in 2 hospitals, 1 health centre and 1 clinic on the records of 400 systematically selected pregnant women before the program in 2003 and another 400 in 2007 using a data extraction form. An observation was made on counselling sessions at ANC clinics and an in-dept interview conducted on midwives and a member of the health management team.

Among the 400 pregnant women sampled from the ANC register, prevalence of anemia (Hb <11g/dl) at registration was 61.2% 2003 compared to 54% ($p<0.001$) in 2007. At 36 weeks 58.8% was anaemic in 2003 compared to 48.5 % ($p<0.001$) in 2007. There was a 7% and 10.3% reduction in anaemia among pregnant women at registration and 36weeks respectively between 2003 and 2007 compared to 25% target set for the program.

14.3% of ANC attendants had 5 visits or more in 2003 compared 15% in 2007 and 77.5%, 32.5% and 13.5% of pregnant women received the 1st, 2nd, and 3rd doses of IPT respectively compared to the 80% target set for the program. 75% of ANC attendants received counseling on anaemia control compared to the 80% target set for the program but on the average, only 16.3% of the key messages were given to each pregnant woman.

Drugs were in regular stock but there was no in-service training and supervision since the program started.

The program was not very effective in the municipality since it achieved only 41.2% of the target set for the outcome indicator (reduction in anaemia rate) and could not achieve the targets set for the process indicators.

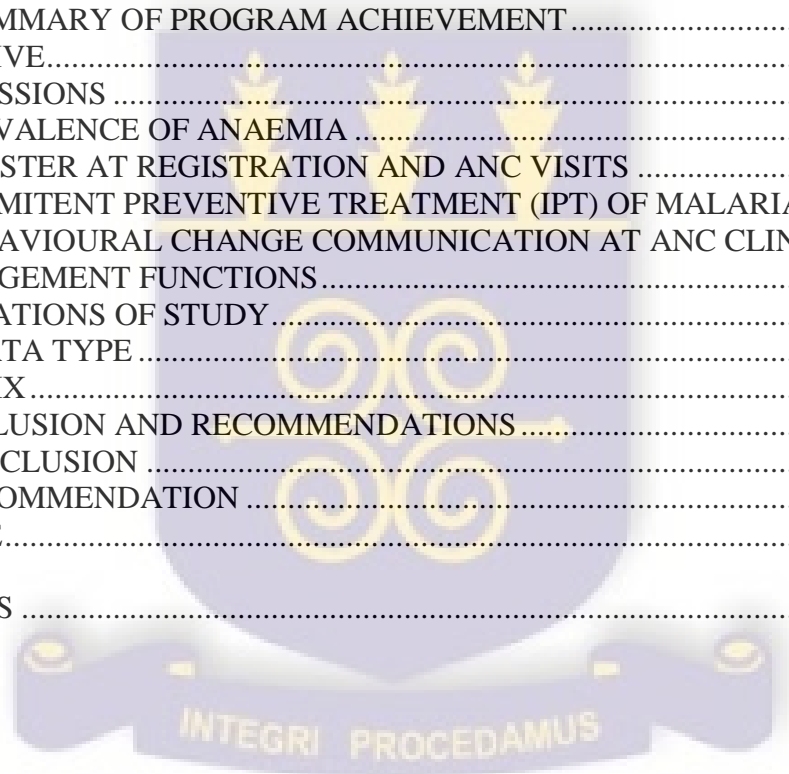
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ACCRONYMS

ANC	Antenatal Care
DHA	District Health Administration
MHMT	Municipal Health Management Team
DHSM	District Health System
EPI	Expanded Program on Immunization
GDP	Gross Domestic Product
GHS	Ghana Health Service
IPT	Intermittent Preventive Treatment
ITN	Insecticide Treated Net
IE&C	Information, Education and Communication
MGDs	Millennium Development Goals
MOH	Ministry of Health
OPD	Out-Patient Department
RHMT	Regional Health Management Team
SP	Sulfadoxine Perimethamine
TB	Tuberculosis
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER ONE

1.0 INTRODUCTION.

Anaemia (Hb <11gm/dl) among pregnant women is a major public health problem in the world today. The World Health Organization (2004) has estimated that up to 56% of all pregnant women living in developing countries were anaemic compared with 18% in the industrialized countries. The greatest burden of anaemia is borne by Asia and Africa where it is estimated that 60% and 52% of women respectively are anaemic and between 1% and 5% are severely anaemic (Hb < 7g/dl). In Ghana, the prevalence of anaemia in pregnancy is 65% (GHS, 2003) and 200 women die each year in pregnancy and childbirth due to anaemia related complications (GHS 2003).

Nutritional deficiencies, parasitic including malaria and helminthic infection and haemoglobinopathies and G6PD deficiency are the major causes of anaemia among pregnant women.

Anaemia during pregnancy has serious consequences for the mother and the foetus. Damage to the brain of the foetus early in pregnancy, low birth weight and increased prenatal risk for neonates are some of the common health effects to the foetus. The anaemic mother is also at high risk of dying of haemorrhage during or after delivery. Research finding (Harrison KA, 1988) has confirmed that in combination with obstetric haemorrhage, anaemia is estimated to be responsible for 17% to 46% of cases of maternal death. Due to its negative effective on the Human Development Index (HDI), the Ghana integrated strategy for the control of anaemia was launched in 2004 to reduce anaemia among pregnant women by 25% by 2007. The program has instituted the following strategies to achieve the program objective: Iron/folate supplementation; intermittent preventive treatment (IPT) of malaria using sulphadoxine perimethamine(SP); and

deworming of all pregnant women attending ANC clinics. The rest are the promotion of ITN use for pregnant women and nutrition counseling. As the International community is working towards the achievement of the Millennium Development Goals(MDGs) this study is intended to evaluate the program to make recommendations to policy makers and all stake-holders to re-strategize for the achievement of MDG 4 and 5 by 2015

1.1 BACKGROUND

Anaemia is the reduction of the haemoglobin(Hb) level in the blood below 11grams/decilitre. When iron-deficient erythropoiesis occurs, haemoglobin concentrations are reduced to below-optimal levels. When individual haemoglobin levels are below two standard deviations (-2SD) of the distribution mean for haemoglobin in an otherwise normal population of the same gender and age who are living at the same altitude, anaemia is considered to be present(WHO, 2003). There are different levels of haemoglobin considered normal for different categories of people depending on age, sex, physiological state, altitude among others. Among pregnant women, the reference point is 11g/dl. Therefore a pregnant woman with haemoglobin level below 11g/dl is considered anaemic. Anaemia in pregnancy is characterized with dizziness, shortness of breath, palpitation, weakness and pail palm, nail bed and conjunctiva among others. In Ghana, the safe motherhood protocol indicates that pregnant women should be screened for their haemoglobin status during the first visit at the ANC clinic and 36 weeks gestation period. Different methods and equipment are available for determining and testing the haemoglobin levels in most health facilities. This includes: the haemoglobin meter, the centrifuge to estimate the haematocrite or packed cell volume and the talqvist method.

1.1.1 PREVALENCE OF ANAEMIA.

The World Health Organization (2004) has estimated that up to 56% of all pregnant women living in developing countries were anaemic compared with 18% in the industrialised countries. The greatest burden of anaemia is borne by Asia and Africa where it is estimated that 60% and 52% of women respectively are anaemic and between 1% and 5% are severely anaemic (Hb < 7g/dl).

1.1.2 CAUSES OF ANAEMIA

There are many underlying and proximate factors affecting anaemia in pregnant women. Knowledge in these factors is very vital in order to prevent and control anaemia effectively among this vulnerable group. The commonest proximate factors which are targeted in the Ghana Anaemia control program are:

1.1.3 NUTRITIONAL DEFICIENCIES

An imbalance as a result of low nutrient intake, poor absorption and increased nutrient loss or demand predictably occurs in many developing countries. Dietary shortcomings are often related to cooking and dietary habits as well as to cost. Local food taboos for pregnant women are many and are commonly adhered to by most pregnancy women. The major food nutrient needed for erythropoiesis is iron. Other nutrients which play vital roles in the formation of blood cells, its transport and utilization are protein, folic acid, pyridoxine (vitamin B6) and B12, vitamin A and ascorbic acid. Foods highly rich in iron and proteins are meat, fish, poultry, egg, and snail other sources of iron are cereals, soybeans, groundnut, and green leafy vegetables. Fruits which are rich in vitamin C (ascorbic acid) are very vital to enhance iron absorption. It is therefore vital for pregnant women to take these food items as part of their regular diet to enhance erythropoiesis and to maintain normal Hb levels during pregnancy.

1.1.4 PARASITIC DISEASES

Malaria in pregnancy causes haemolytic anaemia and exacerbates folate deficiency (Fleming AF. 1981). In some areas of Africa malaria is believed to be one of the most important aetiological factors underlying anaemia among pregnant women (Jackson DJ, Klee EB, 1991) Hookworm infection with *Necator americanus* or *Ankylostoma duodenale* is found in many tropical areas and the development of anaemia as a result of hookworm infection depends on the content and bioavailability of iron in the diet, the size of the body's iron stores and the intensity and duration of the infection (Crompton DWT, Whitehead RR., 1993) *Trichuris trichuria*, *Schistosoma haematobium* and *Schistosoma mansoni* may also contribute but in isolation they are unlikely to result in severe anaemia.

1.1.5 HAEMOGLOBINOPATHIES AND G6PD DEFICIENCY

G6PD deficiency is the commonest red blood cell enzymopathy. A shortened red cell lifespan and haemolytic anaemia which may be severe are observed in association with certain drugs. Haemolysis induced by infection may be a more common cause of clinically significant haemolysis in patients with G6PD deficiency than has previously been thought (Beutler E.1994)

1.1.6 EFFECTS OF ANAEMIA IN PREGNANT WOMEN

Anaemia during pregnancy has serious consequences for the mother and the foetus. Damage to the brain of the foetus early in pregnancy, low birth weight and increased prenatal risk for neonates are some of the common health effects to the foetus. The anaemic mother is also at high risk of dying of haemorrhage during or after delivery. Research finding (Harrison KA, 1988) has confirmed that in combination with obstetric

haemorrhage, anaemia is estimated to be responsible for 17% to 46% of cases of maternal death

It has been identified therefore that the aetiology of anaemia in pregnancy in developing countries is multifactorial. As enumerated above, the causes include nutritional deficiencies of iron and folate, haemoglobinopathies and secondary effects of infection and parasitic infestation, especially malaria and hook-worm. Infection with human immunodeficiency virus (HIV) must now be included in the differential diagnosis (WHO, 2004) More recently, it has been suggested that vitamin A deficiency is associated with anaemia (.Suhamo D, West CE,) The different causes interact to form a complex picture (e.g. haemolysis as a result of malaria may result in folate deficiency and associated splenomegaly may result in sequestration with further destruction of red cells).

Ghana as other developing countries has documented anaemia as a major cause of morbidity and mortality. In 2003, it was the 3rd top cause of admission (5.2%) and the 2nd top cause of death (9.6%) only after malaria in health institutions in the country (Ghana Health Service, 2005)

The need to focus attention on anaemia control among pregnant women cannot be overemphasized in the achievement of the Millennium Development Goals 4 and 5 (MDGs) by 2015

Efforts by health authorities and policy makers in this direction is reflected in the goals on the reduction of anaemia endorsed by Heads of State and Ministers in the 'World declaration and plan of action for Nutrition from the International conference on Nutrition, (World Health Organisation, 1992).

In Ghana, a national program to reduce anaemia among pregnant women was launched in 2004 as a major strategy in reducing maternal and infant mortality in the country. This

study seeks therefore to evaluate the effectiveness of the program during the four years of inception. The study would identify the achievements and shortfalls of the program and make recommendations to all stakeholders to facilitate and consolidate efforts at achieving the set goals.

1.2 PROBLEM STATEMENT

A study in Ghana ([Mockenhaupt FP](#), [Rong B](#) 2000) has shown that anaemia was found in 54% of pregnant women. The Ghana Health Service (2003) also has quoted 65% as the prevalence rate of anaemia among pregnant women in Ghana. Statistics from the Nutrition Unit of the Ghana Health Service estimated that 200 women die each year during pregnancy and childbirth due to complications related to anaemia. (GHS, 2003). In 2007, while 24% of pregnant women attending ANC clinic in Ashanti Region were anaemic at registration, the prevalence has increased to 28.3% at 36 weeks of gestation. This is an indication that the risk of anaemia and its negative consequences increases among pregnant women in the region with gestational period. In the study area-Ejisu-Juaben municipality of Ashanti region, out of 4999 pregnant women screened for haemoglobin levels at registration in 2007, 40.5% were anaemic and out of 1129 pregnant women screened at 36 weeks, 39.2% were anaemic (ARHD, 2007) The high prevalence of anaemia among pregnant women is a major public issue in Ejisu-Juaben municipality.

In 2007 out of 2709 births conducted in health institutions, Ejisu-Juaben municipality recorded 59 still births constituting 2.1% of live births while 221 of the babies were born with low birthweight(<2,500kg). These are indications of the adverse consequences

of anaemia among pregnant women in the municipality. Anaemia among pregnant women in the municipality is therefore a major challenge to the achievement of the Millennium Development Goals 4 and 5.

The integrated strategy for the control of anaemia in Ghana was launched in all parts of the country to reduce the high prevalence of anemia among pregnant women among other target groups. Program objectives (GHS 2003) targeted towards pregnant women by 2007 are to:

1. Reduce the prevalence of anaemia in pregnant women by 25%
2. Increase the proportion of pregnant women starting ANC clinic in their 1st trimester from 25% to 40%
3. Increase the average ANC attendance per pregnant woman from 3 to 6times
4. Increase the proportion of pregnant women taking iron/folic supplement daily and IPTp by 25%
5. Increase the proportion of pregnant women sleeping in ITN to 60%
6. Increase to 80% the proportion of pregnant women taking iron rich foods daily.
7. Increase the proportion of pregnant women receiving nutrition counseling to 80%.

Under the intervention, all pregnant women are requested to attend ANC clinic where the following services are provided: iron/folic supplementation; intermittent preventive treatment (IPT) of malaria using sulphurdozine perimethamine(SP); deworming. The rest are promotion of ITN use for pregnant women and nutrition counseling. After implementing the program through 2004 and 2007, it is therefore vital to conduct an evaluation study as stated in the program document (GHS 2003) to determine the

effectiveness of the program. The effectiveness of program will be evaluated based on the program objectives stated above.

1.3 JUSTIFICATION

Anaemia (Hb <11gm/dl) among pregnant women is a major public health problem in Ghana and it is a direct cause of death among pregnant women and babies hence, a major challenge to the achievement of the Millennium Development Goals 4 and 5(reduction of infant and maternal mortality)

The Ghana Health Service (2003) quoted 65% as the prevalence rate of anaemia among pregnant women in Ghana. In 2007, whiles 24% of pregnant women attending ANC clinic in Ashanti Region were anaemic at registration, the prevalence has increased to 28.3% at 36 weeks of gestation. This is an indication that the risk of anaemia and its negative consequences increases among pregnant women in the region with gestational period. In the project district area-Ejisu-Juaben municipality of Ashanti region, out of 4999 pregnant women screened for haemoglobin levels at registration in 2007, 40.5% were anaemic (Hb <11gm/dl) and out of 1129 pregnant women screened at 36 weeks, 39.2% were anaemic (Ashanti Region, 2007)

The integrated strategy for the control of anaemia in Ghana was launched in all parts of the country to reduce the high prevalence among pregnant women by 25% by 2007. In the program document, the program should be evaluated by the end of 2007 to determine its effectiveness. The study was therefore conducted to evaluate the effectiveness of the intervention between 2003 and 2007. The outcome and process indicators as stated in the program document were the basis for the evaluation. Findings from the study is therefore

an evidence based recommendation for all stake-holders to re-strategize towards the achievement of the Millennium Development Goals (MDGs)

1.4 RESEARCH QUESTIONS

In order to reach the objectives of the study, the following research questions were asked:

1. What is the difference in the prevalence rate of anaemia in 2003 and 2007?
2. What is the prevalence of anaemia at registration compared to at 36 weeks of gestation period?
3. Does an IPT dose have any relationship with haemoglobin levels in pregnant women?
4. Does the number of ANC visits have any relationship with haemoglobin levels in pregnant women?
5. What is the parity of pregnant women attending ANC clinics in the municipality?
6. Does parity have any relationship with haemoglobin levels of pregnant women?
7. Are clinicians and midwives managing anaemia with recommended iron supplements in the program protocol?
8. What is the difference in the proportion of pregnant women registering at ANC in the 1st trimester in 2003 and 2007?
9. Which proportions of ANC attendants are receiving the 1st, 2nd and 3rd doses of IPT?
10. Does IPT doses taken by a pregnant woman relate to the time(trimester) of registration at the ANC clinic?
11. Does the number of ANC visits have any influence on IPT doses received by the pregnant woman?
12. What proportion of ANC attendants are receiving health/nutrition counseling?

13. Which messages are contained in the counseling given the pregnant women?
14. How regularly is the MHMT monitoring and supervising the program?
15. How often is in-service training organized for service providers on the program?

1.5.0 OBJECTIVES

1.5.1 GENERAL OBJECTIVE

The general objective of the study was to evaluate the anaemia in pregnancy program in Ejisu-Juaben Municipality.

1.5.2 SPECIFIC OBJECTIVES

- I. To compare the prevalence of anaemia in pregnant women in the municipality between 2003 and 2007.
- II. To compare the ANC registration in the first trimester and the number of ANC visits per pregnant woman between 2003 and 2007 in the municipality.
- III. To compare the proportion of pregnant women receiving the 1st, 2nd and 3rd doses of IPT in 2007.
- IV. To assess the Information, Education, and communication (IE&C) provided at the Ante-Natal Care clinics in the municipality.
- V. To assess the management roles of the Municipal Health Authorities in the implementation of the program

CHAPTER 2

2.0 LITERATURE REVIEW

Anaemia in pregnancy is a major public health issue because of its significant effect on maternal and infant mortality especially in the developing world. Even though a lot of work has been done all over the world and literature is abundant on the prevalence, risk factors, consequences and control measures, enough has not been done on evaluation of control strategies to determine effectiveness and impact especially in Africa and specifically in Ghana.

2.1 THE PREVALENCE OF ANAEMIA

Anaemia (Hb < 11g/dl) ranges from mild, moderate to severe and the World Health Organization (1989) pegs the haemoglobin level for each of these types of anaemia in pregnancy at 10.0 – 10.9g/dl (mild anaemia) 7 – 9.9g/dl (moderate anaemia) and < 7g/dl (severe anaemia). According to WHO, prevalence of anaemia can be as high as 61% in developing countries with a high incidence and severity occurring among primigravidae living in malaria endemic areas. The classifications used for the anaemia control in Ghana (GHS 2004) is: 7-10.9g/dl (moderate/mild); 4-6.9g/dl (severe); below 4g/dl (very severe). Studies in Nigeria (OA Idowu, CF Mafiana, 2005) have shown that anaemia is a major problem among pregnant women. The World Health Organization (2005) estimates that more than half of pregnant women in the World have a haemoglobin level indicative of anaemia (< 11.0g/dl), and according to the world organization, the prevalence may be as high as 56 or 61% in developing countries. UNICEF (1999) has documented that anaemia affect more than 3.5 billion people in the developing world. In examining the prevalence of anaemia in different physiological groups using the WHO Global Database

(1998), pregnant women are the most affected group. It is indicated that the prevalence of anaemia in developing countries is three to four times higher than in industrialized countries. In developing countries 56% of pregnant women compared to 44% of nonpregnant women are anaemic. However, only 18% of pregnant women and 12% of nonpregnant women are anaemic in the developed world (WHO, 1998).

On the geographical distribution of anaemia in pregnant women, the middle part of Africa -from the west to the east is the most affected, with anaemia prevalence ranging from 42% to 53%. In Asia the most affected sub-region is South Central Asia, in the Americas the Caribbean is most affected, with a prevalence of 39%, while anaemia prevalence in South and Central America are similar to those observed in the remaining parts of Africa and Asia. Among industrialized countries, anaemia prevalence is lowest in Northern Europe (2%) and around 5% in Western Europe and North America. (UNICEF/UNU/WHO/MI, 1999). A study in Ghana ([Mockenhaupt FP](#), [Rong B](#), 2000) has shown that anaemia was found in 54% of pregnant women. The Ghana Health Service (2004) quoted 56% as the prevalence rate of anaemia among pregnant women in Ghana. In 2007, while 24% of pregnant women attending ANC clinic in Ashanti Region were anaemic at registration, the prevalence has increased to 28.3% at 36 weeks of gestation. This is an indication that the risk of anaemia and its negative consequences increases among pregnant women in the region with gestational period. In the study area-Ejisu-Juaben municipality of Ashanti region, out of 4999 pregnant women screened for haemoglobin levels at registration in 2007, 40.5% were anaemic (Hb <11gm/dl) and out of 1129 pregnant women screened at 36 weeks, 39.2% were anaemic (Ashanti Region, 2007) This revelation necessitated the evaluation of the anaemia control program to

determine its effectiveness and impact in order to make recommendations to all stake holders to consolidate gains made or re-strategise for the achievement of the MGDs

2.2 CONSEQUENCES OF ANAEMIA IN PREGNANCY

Anaemia impairs cognitive development of children from infancy through the adolescent age; it damages the immune mechanism and therefore is associated with high morbidity and mortality. During pregnancy, anaemia is associated with multiple adverse outcomes for both mothers and infants including increased risk of haemorrhage, sepsis, morbidity, perinatal morbidity and low birth weight. Anaemia among pregnant women is therefore a major challenge to the achievement of the Millennium Development Goals especially goals 4 and 5 (reduction of infant and maternal mortality)

Studies have reported a relation between maternal and cord blood haemoglobin levels and iron status (Gaspar MJ, Ortega RM, 1993) In developing countries anaemia and iron deficiency are likely to result in higher perinatal and infant mortality and morbidity. Delays in mental and psychomotor development have been described in anaemic compared with nonanaemic infants (Walter T, De Andraca I, 1989).

Each year more than 500 000 women die from pregnancy related causes, the vast majority (99%) in developing countries (WHO/MCH/MSM/91.6.) Estimates of maternal mortality from anaemia range from 34 per 100,000 live births in Nigeria to as high as 194 per 100,000 in Pakistan (WHO/FHE/MSM/93.5) In combination with obstetric haemorrhage, anaemia is estimated to be responsible for 17% to 46% of cases of maternal death (Harrison KA, 1988) Diminished work capacity and physical performance are reported as a result of anaemia. (Hallberg L, Scrimshaw NS, 1981) Iron deficiency

anaemia may lead to abnormalities in host defense and neurological dysfunction (Dallman PR., 1987) Increased risks of premature labour (Allen LH.,1993) and low birth weight (Mitchell MC. Lerner E ,1992) have been reported in association with anaemia in pregnancy. Both are common problems in developing countries and contribute significantly to high perinatal mortality. Most published work comes from developed countries where anaemia is much less of a problem and less severe. Confounding factors such as poverty, poor antenatal clinic attendance and recurrent infection, which can result in low birth weight and prematurity, are seldom examined at the same time. An analysis of the economic consequences of iron deficiency has estimated the median value of productivity losses due to iron deficiency to be about US\$4 per capita, or 0.9% of GDP, for a range of developing countries (Ross J, Horton S 1998). The dominant effect is the loss associated with cognitive deficits in children.

2.3 ASSESSMENT OF ANC SERVICES AND THE CONTROL OF ANAEMIA

Ante Natal Care services is a vital health care service for the implementation of strategies for preventing anaemia among pregnant women. Services provided at ANC towards the prevention of anaemia include screening for malaria parasites, haemoglobin status, worm infestation and other risk factors during pregnancy. Iron supplements, de-wormers, IPT are given to all pregnant women attending the clinic in addition to nutrition education.

World Health Organization (2003) reports shows that in sub-Saharan Africa, 68% of the pregnant women make at least one ANC visit ([World Health Organization/UNICEF 2003](#)) and the most recent demographic and health survey in Kenya showed that 88% of women visited the ANC at least once ([Kenya 2004](#)). Among these attendants, the median gestational age at first visit was 5.7 months for urban areas and 5.9 months for the rural

areas. Records from the Ghana Health Service indicates that in 2004, ANC registrants was 89.2% and in Ashanti Region of Ghana, it was 79 % (Ghana Health Service, PPME, 2005). This high uptake of ANCs by pregnant women provides an excellent opportunity to implement malaria and anaemia prevention strategies during pregnancy. The anaemia control in pregnancy program in Ghana uses the ANC clinic as the major point for providing services to control anaemia among pregnant women. This includes intermittent preventive treatment of malaria (IPT) with sulfadoxine perimethamine (SP), iron, and folate supplementation and provision of Insecticide Treated Net (ITN) (Ghana Health Service, 2004). Reports (World Health Organization/UNICEF 2003) demonstrates that even though many women who start visiting ANC are already parasitaemic and anaemic, and at least some of these strategies may be more effective if implemented earlier. While IPT is not recommended until after quickening, an earlier start of ITN use and iron and folate supplementation, even before pregnancy, may be beneficial. As the first step, health education strategies should emphasize early clinic attendance as recommended by the WHO ([WHO/AFRO 2004](#)) for pregnant women to assess these earlier interventions.

2.4 MALARIA AND THE USE OF IPT IN THE CONTROL OF ANAEMIA IN PREGNANT WOMEN

Malaria during pregnancy causes rapid breakdown of the red blood cells therefore suppressing the process of erythropoiesis. This is a major cause of anaemia among pregnant women in malaria endemic regions. Low birth weight is one of the resultant consequences of malaria in pregnancy.

It is estimated that in sub Saharan Africa 23 million pregnant women are exposed to malarial infection annually and women in their first and second pregnancies living in an endemic area are at a higher risk of acquiring malaria than non pregnant women or multi

gravidae, due to reduction of an appropriate immune response to the malaria parasite (WHO, 1992).

Anaemia associated with malaria is caused by haemolysis of the red blood cells.

Hypersplenism, a condition characterized by exaggeration of the inhibitory or destructive functions of the spleen, contributes to the anaemia in up to 25% of women who suffer from malaria in pregnancy. Studies have shown that protection against malaria contributes to the prevention of anaemia in pregnancy (Mkandala C, 2003) thus highlighting the importance of chemoprophylaxis and other methods of malaria control. The adverse effects of malaria on maternal and foetal well being are thought to be for the most part due to the associated severe anaemia. (WHO, 1992).

In the anaemia control program of Ghana, it was recommended that all pregnant women attending ANC clinics are given three doses of intermittent preventive treatment (IPT) with sulphadoxine perimethamine (SP) to prevent them from malaria infection. The use of ITN is also promoted among pregnant women during their ANC attendance.

2.5 THE USE OF IRON/FOLIC SUPPLEMENTS IN ANAEMIA CONTROL IN PREGNANT WOMEN

Iron deficient anaemia may occur despite adequate dietary intake. Even though iron absorption increases in response to iron deficiency and in the course of normal pregnancy (Whittaker PG, Lind T, 1990), absorption is often inhibited by the high phytate content of many of the grain based diets in the tropics. Diseases of the intestine, such as coeliac disease, tropical sprue, parasitic enteropathies and enteropathy as a result of HIV infection, presumably contribute to further problems of absorption.

An authoritative meta-analysis conducted by Beaton and McCabe (1999) on the efficacy of intermittent iron supplementation showed that (1) both daily and weekly iron

supplementation are efficacious, but weekly supplementation is likely to be less effective than daily administration, except in situations where weekly but not daily supervision is feasible; (2) weekly supplementation may be particularly disadvantageous during pregnancy and in situations where the baseline prevalence of anaemia is high; (3) unless ways are found to greatly improve compliance, neither daily nor weekly supplementation is likely to be an effective approach to preventing and controlling anaemia in developing countries, and (4) regardless of the degree of supervision that can be arranged, weekly iron administration instead of daily is *not* recommended for pregnancy.

In summary, anaemia among pregnant women remains an important public health problem. Haematinic supplementation, even when started late in the third trimester of pregnancy, may have a beneficial effect on haemoglobin level. Although the long-term effect of haematinic supplementation in HIV-seropositive women needs to be evaluated, the short-term effect suggests an encouraging reduction in postpartum anaemia.

2.6 THE USE OF ANTE-HELMINTHES IN ANAEMIA CONTROL AMONG PREGNANT WOMEN

Hookworm infection with *Necator americanus* or *Ankylostoma duodenale* is found in many tropical areas. According a study conducted by Crompton and Whitehead (1993) the development of anaemia as a result of hookworm infection depends on the content and bioavailability of iron in the diet, the size of the body's iron stores and the intensity and duration of the infection. Adult hook worms live in duodenum and jejunum of humans attached to the intestinal mucosa and suck blood. Once they leave the attached site this causes chronic blood loss from the mucosa. In people whose dietary intake of iron is low and whose blood iron stores are already depleted, hookworm infection can presumably give rise to iron deficiency anaemia in just a few weeks, especially during

pregnancy, when iron requirements are increased (WHO, 1992). Although laboratory assessment of hookworm infection is relatively simple, prevalence rates for pregnant women are rarely published. *Trichuris trichuria*, *Schistosoma haematobium* and *Schistosoma mansoni* may also contribute but in isolation they are unlikely to result in severe anaemia.

In a study conducted by Glover-Amengor, W B Owusu, and BD Akanmori(2005) in the Sekyere West district of Ashanti region, they found a mean Hb of 8.3g/dl in women who were hookworm positive but malaria negative, while those who were hookworm and malaria negative had a significantly higher mean Haemoglobin of 9.5g/dl

2.7 GOOD NUTRITION AND ANEMIA CONTROL IN PREGNANT WOMEN,

NUTRIENTS NEEDED AND THEIR PHYSIOLOGY IN ERYTHROPOISIS

Mohamed K (2003) estimated that iron deficiency anaemia affects as many as 200 million people in the world probably making this the commonest nutritional deficiency in the world. In their study on the iron status of pregnant women, van den Broek NR, Letsky EA, (1998) found that among pregnant women, at least half of all anaemia cases have been attributed to iron deficiency. In their study on the aetiology of anaemia in among pregnant women in Southern Malawi, Van den Broek NR, Letsky AE (2000) found that the prevalence of iron deficiency may be 2-3 times that of anaemia, ranging from about 50% in some countries to nearly 100% in parts of others. As pregnancy proceeds, most women show haematological changes suggestive of iron deficiency especially if not receiving iron supplements. The additional demands placed on maternal iron stores by the growing foetus, placenta and the increased maternal red cell mass –though partially offset by cessation of menstruation and increased absorption of iron during pregnancy- lead to

an increased demand of iron. One of the major contributory factors in less industrialized countries is consumption of plant based food containing insufficient iron, especially insufficient available haem iron from meat. Iron is obtained in the form of non-haem iron from vegetables and as haem iron from meat. Haem iron is absorbed about two to three times better than non haem iron. A small amount of haem iron in the diet will improve absorption of non haem iron and thus the diet composition is an important determinant of the amount of iron actually absorbed. It has been known that vitamin A plays an important role in haematopoiesis and more recently it has been suggested that vitamin A supplementation, particularly in women with low or borderline serum retinol concentration, may improve mobilization of iron stores. Therefore in preventing anaemia among pregnant women, the importance of nutrition counseling at the ANC clinic cannot be overemphasized.

2.8 EVALUATION OF ANAEMIA INTERVENTION PROGRAMS

In their evaluation of the national nutritional anaemia control program in India, Usha Malagi, Madhavi (2006) it was documented that only 59% of pregnant women on the program took all their iron tablets while 10% did not receive any iron supplements at all. Enough work has been done in different parts of the world on the prevalence of anaemia in pregnant women, causes of anaemia and consequences to the mother and the fetus and the baby. The clearly identified gap as it applies to other intervention programs is lack or inadequate evaluation of intervention programs. Very little work has been done especially in the sub Saharan Africa in this vital area. Findings from this evaluation study have therefore contributed immensely to scientific knowledge in this direction to further improve on the health status of women the sub region generally and Ghana specifically.

CHAPTER 3

3.0 METHODOLOGY

3.1 TYPE OF STUDY

The study was an evaluation study comparing output and outcome before (2003) and after the program (2007).

3.2 STUDY AREA

The study was conducted in Ejisu-Juaben municipality in the Ashanti Region of Ghana.

3.2.1 GEOGRAPHY.

Ejisu-Juaben municipality is one of the twenty one districts/municipalities in the Ashanti Region of Ghana. Divided into five sub-municipalities, the municipality has an estimated 2007 population of 151,761 distributed in 81 communities. Ejisu the municipal capital is about 12 km from Kumasi the Regional Capital of Ashanti Region. The municipal area situated in the central part of Ashanti Region lies within latitude 1o 15” N and 1o 45” N and longitude 6o 15” and 7o W.

The municipality shares boundaries with 6 other districts. At the North East and North West borders are Sekyere East and Kwabere Districts respectively. South are Bosomtwe Atwima Kwanwoma, and Asanti Akyem South; its eastern boarders are shared with Ashanti Akyem North District and the west is Kumasi Metropolis. The municipality stretches over an area of approximately 637.2 sq km.

The municipality lies with-in the forest belt of the country. The vegetation is mainly tropical rain forest with transitional zone of tropical savannah. Mean temperature is 27^{Oc} with annual rainfall between 1500mm – 200mm. The rainfall pattern follows two seasons-March – July (major season) and September – November (minor season) with a sharp break in August each year.

3.2.2 COMMUNICATION.

The first class Accra-Kumasi road network stretches through Nobewam to Fumesua in the municipality. Ejisu to Juaben, Ejisu to Kwaso and Bomfa Nkwanta to Achiase are all second class tarred roads. Communication in the municipality is possible through various networks operating in the country.

3.2.3 ECONOMIC ACTIVITIES.

The main economic activity of the populace is farming. Cassava, plantain and Maize are the major crops grown. Bonwire in the municipality is a major Kente producing community and a tourist destination point in. Because of its proximity to Kumasi, trading is also very prominent in the municipality. Most women in the municipality do their daily trading activities in the capital, Kumasi.

3.2.4 HEALTH CARE DELIVERY

Health care services are provided to the population through 23 public and private health facilities. This comprise of 5 hospitals, 5 health centers, 3 public clinics and maternity homes, 4 mission clinics and 6 private maternity homes. The municipality also provides preventive health services through 81 outreach clinics evenly distributed in the communities.

The doctor/patient ratio is 1: 30,352 compared to the Nurse/patient ration of 1:3,994. A total of 155 professional and non-professional staff provides curative and preventive health care to the population.

OPD attendance per capital saw a marginal increase from 5.2 to 5.3 between 2004 and 2006 and malaria continue to be the leading cause of OPD attendance. Between 2004 and 2006, anaemia continues to appear consistently among the ten top OPD cases and a leading cause of hospital admission only after malaria. The municipality recorded 79.6% ante-natal care registration, 38.1% family planning acceptance rate and 79.5% PENTA3 coverage in 2006(EJM, 2006)

In 2007, 40.5% and 39.2% of pregnant women attending ANC clinics in the municipality were anaemic at registration and at 36weeks respectively. Out of 2709 births recorded in the health institutions, 8.2% were low birth weights(<2,500kg) while 2.1% were still births(ARHD, 2007)

In 2006, the municipal health authority identified the following as the major challenges to health care delivery: inadequate professional and skilled staff ;Old and weak vehicles and motor-bikes; inadequate / lack of essential logistics and equipment; low TB Case detection and Case Holding; High TB defaulter rate and Case fatality Rate. The rest are low IPT, ITN coverage in the malaria control program

Major concerns of the municipal health directorate are: to strengthen community based surveillance system; to improve EPI activities in the district, and establish the community based growth promotion program. To improve efficiency of health care, the authority also targeted capacity building through in-service training. Strengthening ties with the municipal Assembly towards the scaling up of the District Mutual Health Insurance Scheme is another priority for the directorate. Improvement on the malaria & guinea-worm program, Strengthening of STI/HIV/AIDS campaign and making Ghana poliomyelitis free country are other priority areas of the district.

3.3 VARIABLES

Outcome/Dependent Variable: The outcome variable of the evaluation was prevalence of anaemia (Hb <11gm/dl) among pregnant women.

Independent Variables: The independent variables which were explored in the study are: age of ANC clients; time of registration at the ANC clinic; average number of ANC visits; Intermittent Preventive Treatment (IPT) and parity of pregnant women attending ANC clinics. The rest are in-service training for midwives; Nutrition counseling at the ANC clinic and supervision by the municipal health managers.

3.4 STUDY POPULATION

The study population was pregnant women attending ANC clinic, midwives providing safe motherhood services and the Core MHMT members of the municipality.

3.5.0 SAMPLING METHOD

3.5.1 HOSPITALS

Convenience sampling method was used to select 2 public hospitals (Juaben and Ejisu) out of the 5 hospitals in the municipality for the study. This is because of the availability of laboratory services which makes it possible for most of the pregnant women attending these facilities to go through the haemoglobin test and the substantial proportion of pregnant women in the district who uses the two facilities.

3.5.2 HEALTH CENTERS

A random sampling method was used to select Kwaso health center and Tikrom clinic among the five health centers and clinics in the five sub municipalities. The names of all the five health centers in the sub districts were written, folded and put into a cup and then

two independent persons were invited to pick one each. Kwaso health center and Tikrom clinic were picked as a result.

3.5.3 RECORDS REVIEW IN THE ANC REGISTER

In each of the health facilities selected, systematic sampling method was used to capture data from the ANC register. All ANC registrants who have done the haemoglobin estimation at the time of registration and 36 weeks of gestational age are qualified for inclusion in the sample frame. These numbered and the total number was then divided by the sample size (400) to get the sample interval. The last digit on a one Ghana Cedi note was used to determine the 1st pregnant woman picked in the register and the sample interval was used to pick the subsequent ones in the register.

3.5.4 MIDWIVES, HEADS OF HEALTH INSTITUTIONS AND MHMT MEMBER

Conveniently, all midwives in-charge of all health intuitions, heads of all facilities and the municipal Nutrition Officer who is a member of the Municipal Health Management Team (MHMT) were interviewed.

3.5.5 OBSERVATION ON COUNSELLING AT ANC CLINIC

An observation was done health/nutrition counseling given to five (5) randomly selected pregnant women visiting the ANC clinic.

3.6 SAMPLING SIZE

The following assumptions were made in estimating the sample size:

1. Maximum expected prevalence of anaemia among pregnant women in the municipality was 40.5%
2. Margin of sampling error tolerated was 5%

The following statistical formula was used:

$$Z^2 pq$$

$n = \frac{\quad}{d^2}$ where

$$d^2$$

n is the minimum sample size required

p is the maximum expected prevalence rate (%)

q = 100-p

d is the margin of sampling error tolerated (%)

$$1.96^2 (0.4 \times 0.6)$$

Hence, $n = \frac{\quad}{0.05^2} = 367$ pregnant women

$$0.05^2$$

Thus data on a minimum of 367 pregnant was to be collected from the ANC register for a good representation of the population under study. However, to make out for losses, records of a maximum of 400 pregnant women was reviewed from the ANC register for 2003 and repeated for 2007 to compare for before and after the program since there was credible baseline data.

3.7 DATA COLLECTION TECHNIQUE

Multiple data collection techniques were used. This would include:

3.7.1 RECORDS REVIEW

Data was collected from the ANC registers from 4 health Institutions (Ejisu and Juaben hospitals, Kwaso health center and Tikrom clinic) on the hemoglobin levels of pregnant women at registration and 36weeks of gestational period. Data was also collected from the register on the time (trimester) of ANC registration, the number of ANC visits per

pregnant woman and how many dose of Intermittent presumptive treatment (IPT) received using sulfadoxine Pyrimethamine(SP)

3.7.2 KEY INFORMANT INTERVIEW:

A questionnaire was administered on service providers including all midwives in-charge of the maternity units of the health institutions, the heads of the facilities and the nutrition officer who is a member of the core Municipal Health Management Team.

3.7.3 OBSERVATION

An observation was made on quality of nutrition counseling for pregnant women attending the ANC clinics and I E&C materials posted at the health facilities.

3.8 DATA COLLECTION TOOLS

Multiple data collection tools were used for data collection.

3.8.1 SEMI STRUCTURED QUESTIONNAIRE

A semi structured questionnaire was used to interview midwives in-charge of the selected health

facilities, heads of health facilities and the Municipal Nutrition Officer of the Municipal Health Directorate.

3.8.2 DATA EXTRACTION FORM

A designed data extraction form was used to collect data from the ANC register for 2003 and 2007.

3.8.3 OBSERVATIONAL CHECKLIST

An observational checklist was used to collect data on Information, Education & Communication (IE&C) methods employed and counseling sessions during ANC clinics in the health facilities.

3.9 TRAINING OF RESEARCH ASSISTANTS.

Two day training was held for 4 research assistants on ethical issues, the use of the questionnaire and the pre-testing of it before the final administration.

3.10 QUALITY CONTROL.

To guarantee the quality, validity and reliability of data, the principal investigator edited the data for appropriate coding before data entry

3.11 DATA PROCESSING AND ANALYSIS.

Data was entered into SPSS version 12.0 and analyzed for the prevalence of anaemia among pregnant women in 2003 and 2007. A chi-square test was used to confirm any significant statistical difference in proportions of pregnant women anaemic before the program (2003) and now (2007) and the association between the dependent variable (anemia) and the independent variables such as ANC visits, time of registration at the ANC and doses of IPT taken.

3.12 ETHICAL CONSIDERATION/ISSUES

Before the commencement of the study, ethical clearance was sought from all the relevant bodies including the Ministry of Health Ethics Committee, the Ashanti Regional

Health Directorate and the Ejusu-Juaben District Assembly. Consent was also sought from all the interviewees before conducting the interview.

3.13 PRE – TESTING

All data collection instruments developed were Bomfa health centre to make corrections on the data collection tools. The age groupings for the ANC attendants were re-adjusted, occupation and educational status of the clients were erased from the original data collection tool since these are not recorded in the ANC registers.

CHAPTER FOUR

4.0 RESULTS

4.1 SUMMARY OF FINDINGS

The study sought to compare the prevalence of anaemia (Hb <11g/dl) before the intervention (2003) and now (2007); compare the ANC registration in the first trimester and the number of ANC visits per pregnant woman; compare the proportion of pregnant women receiving the 1st, 2nd and 3rd doses of IPT; to assess the Information, Education, and communication (IE&C) provided at the Ante-Natal Care clinics in the municipality and assess the management roles of the Municipal Health Authorities in the implementation of the program. The study made the following findings in relation to each of the specific objective stated above.

4.1.1 PREVALENCE OF ANAEMIA

Among the 400 pregnant women sampled from the ANC register, the prevalence of anaemia (Hb <11g/dl) in Ejisu-Juaben Municipality among pregnant women at their first visit (registration) in 2003 was 61.2% compared to 54% 2007($p < 0.001$). At 36 weeks of gestation period, the prevalence of anaemia in 2003 was 58.8% compared to 48.5 %($p < 0.001$) in 2007 among pregnant women attending ANC clinic at the municipality. This indicates a 7% and 10.3% reduction in anaemia among pregnant women at registration and 36 weeks respectively in the municipality. Also there was a 2.45% and 5.75% reduction in the prevalence rate at registration and 36 weeks in 2003 and 2007 respectively.

4.1.2 ANTE-NATAL CARE

The proportion of pregnant women attending Ante-natal clinic 5 or more times during their pregnancy have increased slightly from 14.5% to 15% in 2003 and 2007

respectively while 43.5% and 42.3% of pregnant women have registered at the ANC clinic in their first trimester during the same period.

4.1.3 INTERMITTENT PREVENTIVE TREATMENT OF MALARIA (IPT)

The proportion of pregnant women who have taken the 1st, 2nd and 3rd doses of Intermittent Preventive Treatment (IPT) in 2007 was 77.5%, 32% and 13.5% respectively. There was a very high drop out rate of 64% between the 1st and 3rd doses of IPT.

4.1.4 BEHAVIOURAL CHANGE COMMUNICATION (BCC).

At the ANC clinic, 75% of attendants were counselled on the prevention anaemia. However, during the counselling sessions, no information was given at the clinics on the dosage, benefits and side effects of the iron supplement given to the pregnant women. 60% were provided information on iron rich foods and 20% on sleeping under insecticide impregnated net (ITN).

4.1.5 PROGRAM MANAGEMENT ROLES BY MHMT.

After the initial training organized for all District/Municipal Directors, midwives, Public Health Nurses and Nutrition Officers before the commencement of the program, the Municipal Health Management Team (MHMT) did not organize any refresher training during the 4 year period for service providers on the program. Supervision of the program was not integrated into the quarterly MHMT facilitative supervisory visit to the sub municipalities and institutions. Procurement of logistics is however done on regular basis by the MHMT and the health institutions and therefore stock levels are adequate during the past six months.

A total of 400 pregnant women who registered for ANC services were sampled from the ANC register in 2003 and the same number in 2007 to compare. The ANC register was

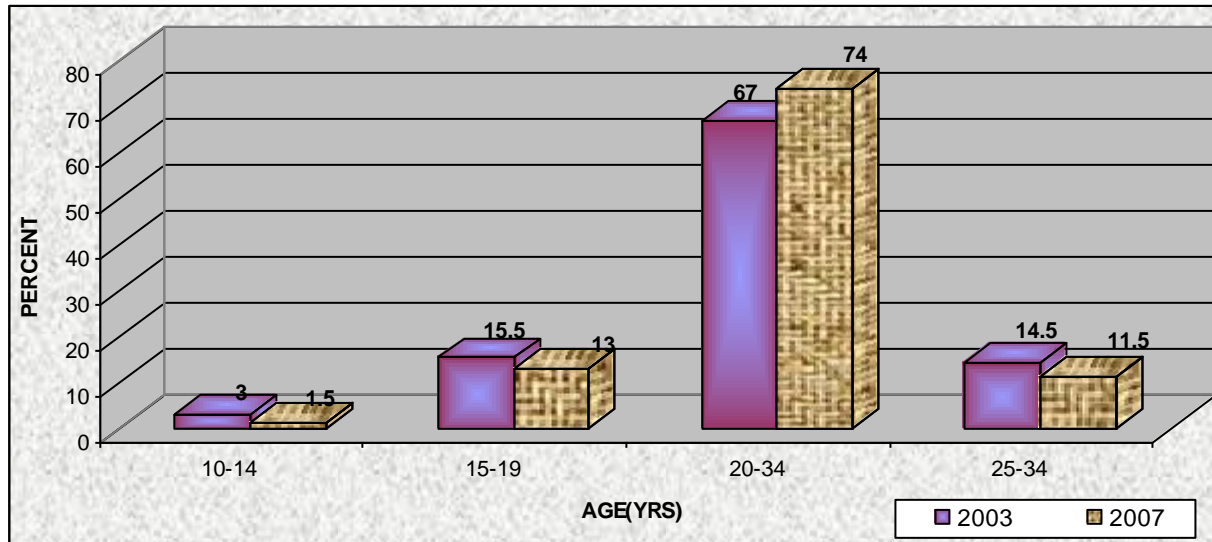
reviewed to collect data on the age of the pregnant women, the trimester of first ANC attendance, number of ANC visits done by the pregnant woman, parity and hemoglobin levels at registration and at 36 weeks of gestational period. Data is also reviewed on the dosage of Intermittent Preventive Treatment (IPT) received during attendance at the ANC clinic. In order to assess the quality of behavioural change communication (BCC) carried at the ANC clinics on anaemia control among pregnant women, 20 counselling sessions at the ANC clinics was observed in the four health facilities. The quality of behavioural change communication was assessed through the content of the information given to the pregnant woman on: iron rich foods; sleeping under ITN; dosage, benefits and the side effects of the iron supplements among others.

The Medical superintendents, Medical Assistants and Midwives In-charge of the facilities were interviewed to determine management roles played for effective implementation of the intervention strategy to meet the set goals. These roles include: in-service training for service providers on anaemia control; quarterly facilitative supervision at all sub metropolis and facilities and the procurement and stocking of the health institutions with iron supplements, folic acid and de-womers.

4.2 AGE OF PREGNANT WOMEN ATTENDING ANC CLINIC

A total of 400 pregnant women attending ANC clinic was sampled from the ANC register in 2003 and 2007. The study indicated that in 2003, 18.5% of ANC attendants were between the ages of 10-19 years old compared to 14.5% 2007. In 2003, 14.5% of pregnant women attending ANC clinic in the municipality were above 35 years old while in 2007, this has reduced to 11.5% as shown in figure 1. This indicates that as high as 33% and 26% of ANC attendants in 2003 and 2007 respectively are in the risk pregnancy group.

Figure 1: Age of ANC attendants in 2003 and 2007



4.3 TRIMESTER AT REGISTRATION AT ANC CLINIC

Out of the 400 pregnant women sampled for each of the periods (2003 and 2007) for comparison, 43.5% had the first attendance at the ANC clinic during their first trimester in 2003 and this has reduced slightly to 42.3% ($p < 0.001$) in 2007. The proportion of pregnant women registering in the 2nd trimester has increased from 40.8% to 44% while those having their first attendance in the 3rd trimester have dropped from 15.8% to 13.8% in 2003 and 2007 as shown on figure 2.

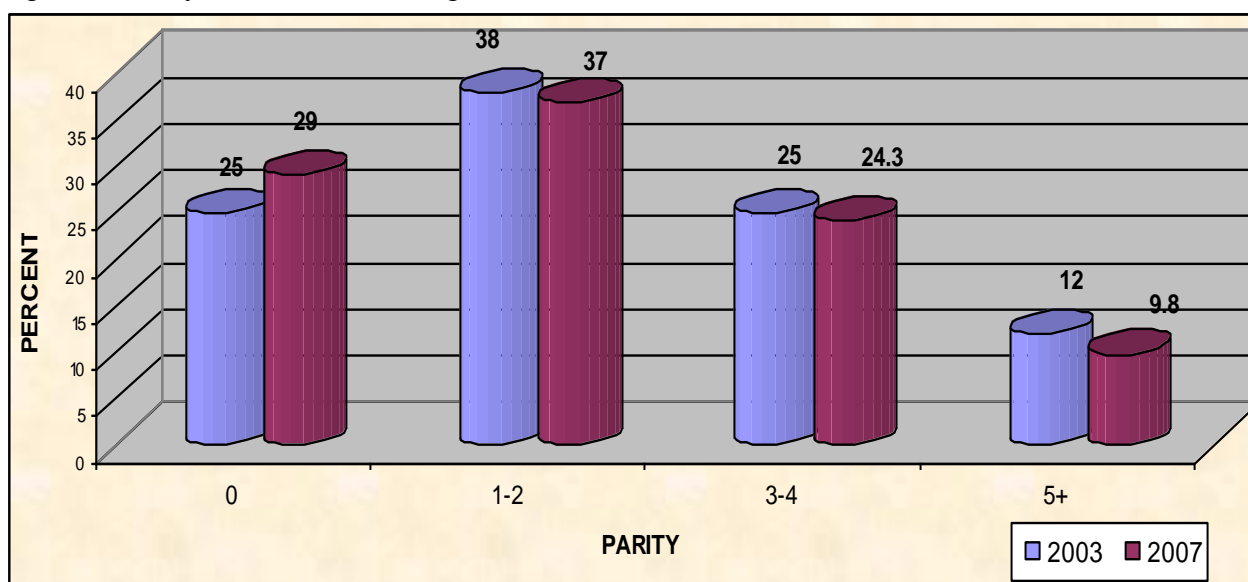
Figure 2: Trimester of registration at the ANC clinic



4.4 PARITY OF PREGNANT WOMEN

The study have shown that the proportion of women attending the ANC clinic having five or more children have reduced from 12% to 9.8% in 2003 and 2007 respectively. However, the proportion of the ANC attendants with their first pregnancy has also increased from 25% to 29% in 2003 and 2007 respectively. As indicated on figure 3 below, the highest proportion of ANC attendants of 38% and 37% in 2003 and 2007 respectively have between 1 and 2 children.

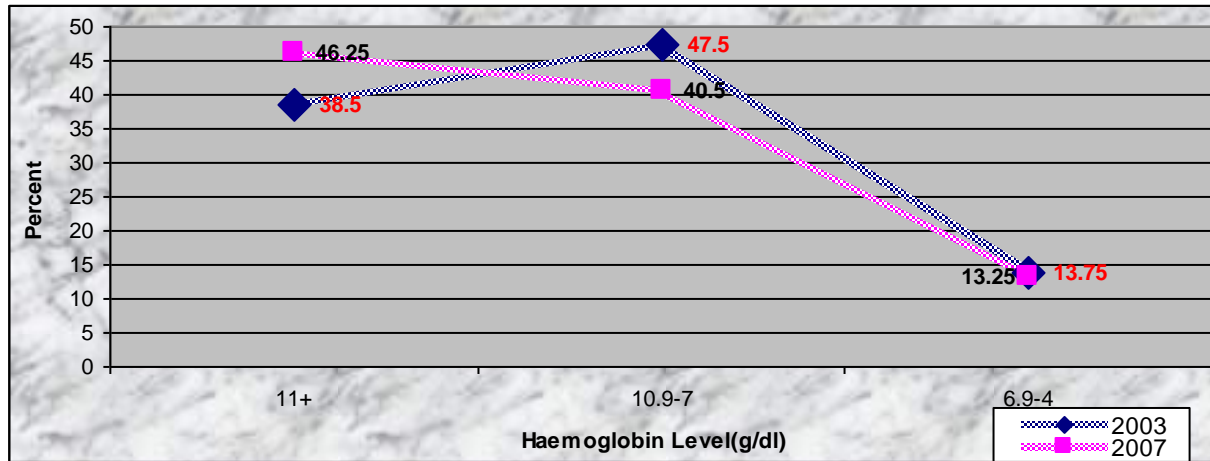
Figure 3: Parity of women attending ANC clinic



4.5 HAEMOGLOBIN LEVELS

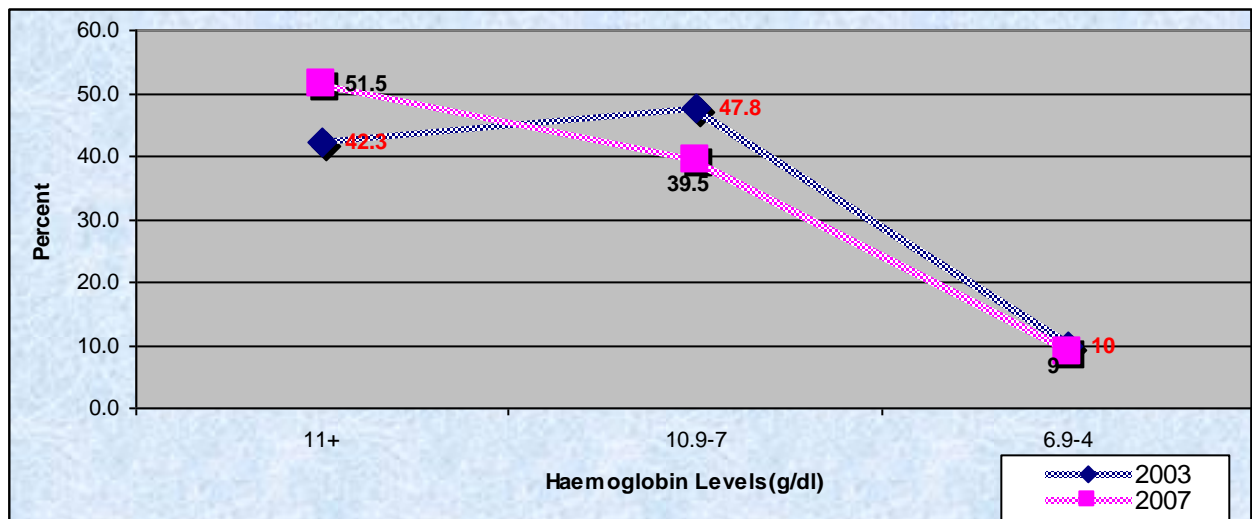
The haemoglobin levels of pregnant women recorded in the ANC register was reviewed in 2003 and 2007. Haemoglobin status was classified as normal (Hb 11+ g/dl); mild/moderate anaemia (Hb 10.9-7 g/dl) and severe anaemia (Hb 6.9-4 g/dl) according GHS (2003). In 2003, prevalence of mild/moderate anaemia among ANC attendants at registration was 47.5% compared to 40.5 % ($p < 0.001$) in 2007. Meanwhile severe anaemia (6.9-4 g/dl) at registration has also dropped marginally from 13.7% to 13.2 % ($p < 0.001$) during the same time period as shown on table 4.

Figure 4: Haemoglobin at registration in 2003 and 2007



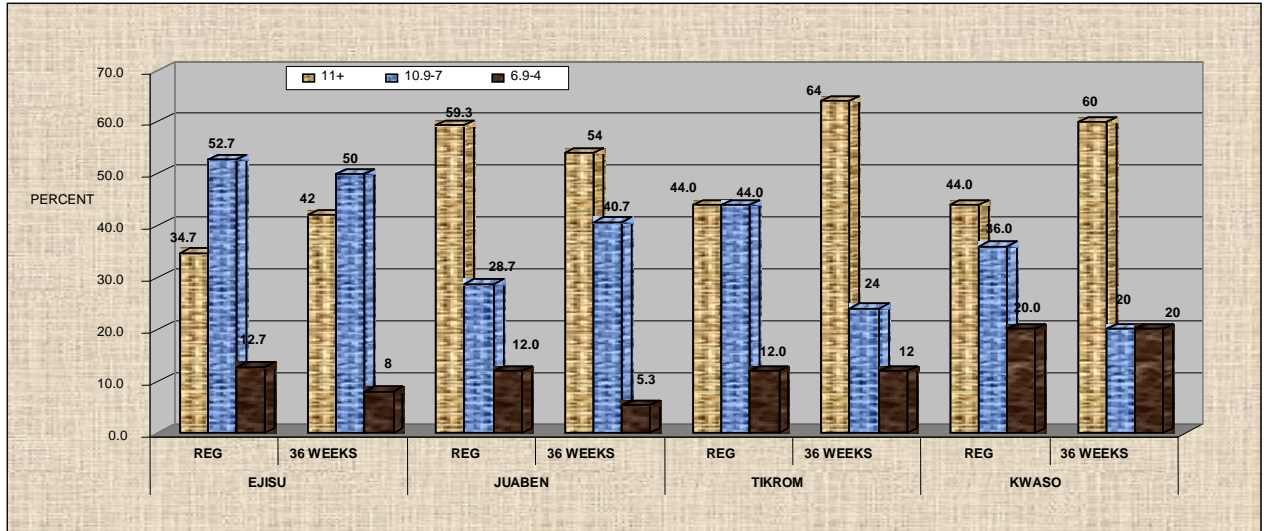
The study has also indicated that at 36 weeks of pregnancy, mild/moderate anaemia dropped from 47.8 % to 39.5% ($p < 0.001$) among pregnant women in 2003 and 2007 respectively while severe anaemia has dropped by 1% (9% to 10% to 9%) in 2003 and 2007 respectively as shown on figure 5.

Figure 5: Haemoglobin at 36weeks in 2003 and 2007



The prevalence of mild/moderate anaemia (Hb 10.9-7 g/dl) at registration ranges between 28.7% in Juaben and 52.7% in Ejisu while normal Hb levels (Hb 11+ g/dl) was between 34% in Ejisu and 64% in Tikrom. Juaben also recorded the lowest (5.3%) prevalence of severe anaemia (Hb 6.9-4 g/dl) while Kwaso recorded the highest prevalence (20%) as shown on figure 6.

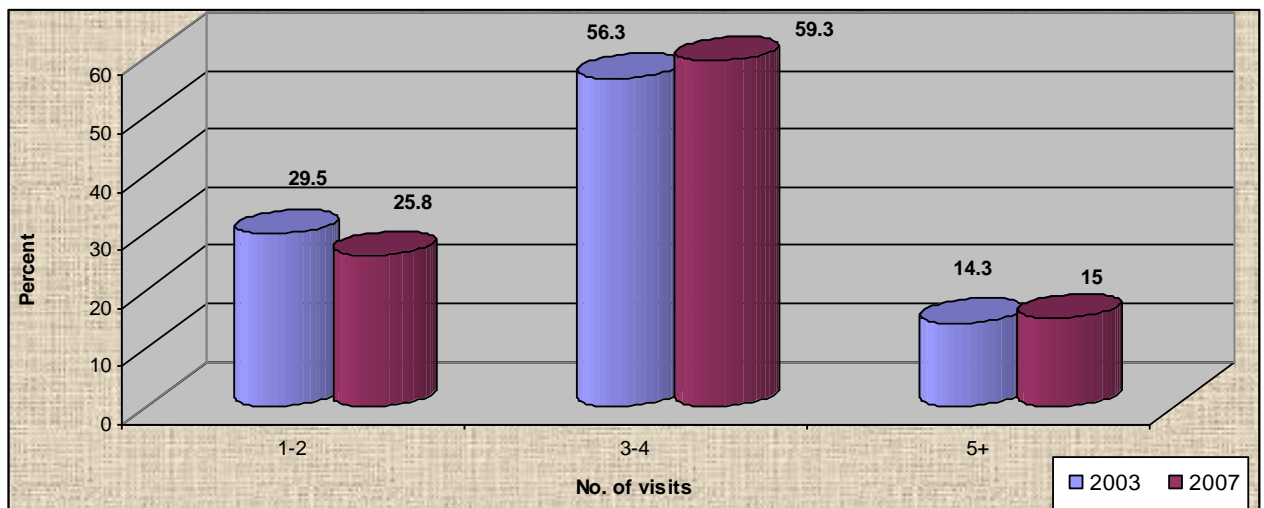
Figure 6: Haemoglobin levels in Facilities



4.6 NUMBER OF ANC VISITS PER PREGNANT WOMAN

There was an insignificant change in the average number of ANC visits done per pregnant woman in 2004 and 2007. The proportion of pregnant women making 3 to 4 visits have increased from 56.3% to 59.3% ($p < 0.001$) in 2003 and 2007 respectively while those making 5 and more visits have also increased marginally from 14.3% to 15% ($p < 0.001$) as shown on figure 7. It was found that more than 50% of ANC attendants in the municipality makes between 3 and 4 visits to the clinic during pregnancy.

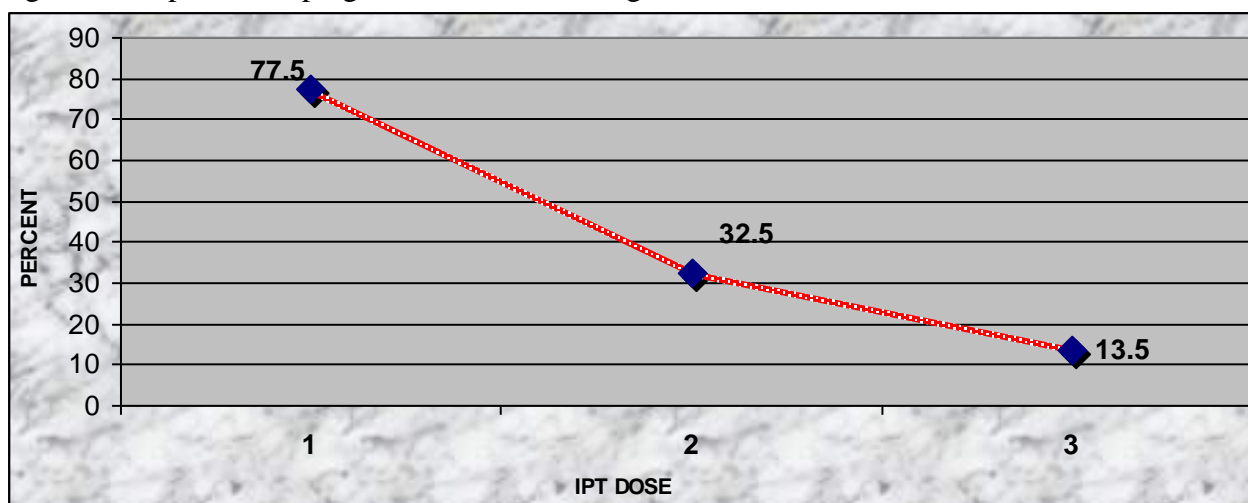
Figure 7: Number ANC visit per pregnant woman



4.7 INTERMITTENT PREVENTIVE TREATMENT (IPT) OF MALARIA

The study has shown a significant decrease in the proportion of pregnant women taking the 1st, 2nd and 3rd doses of IPT in 2007. Whiles 77.5% of pregnant women attending ANC clinic in the municipality have received the 1st dose of IPT, only 32.5% and 13.5% have received the 2nd and 3rd doses respectively. This was about 64% drop-up between the 1st and 3rd doses of IPT.

Figure 8: Proportion of pregnant women receiving IPT

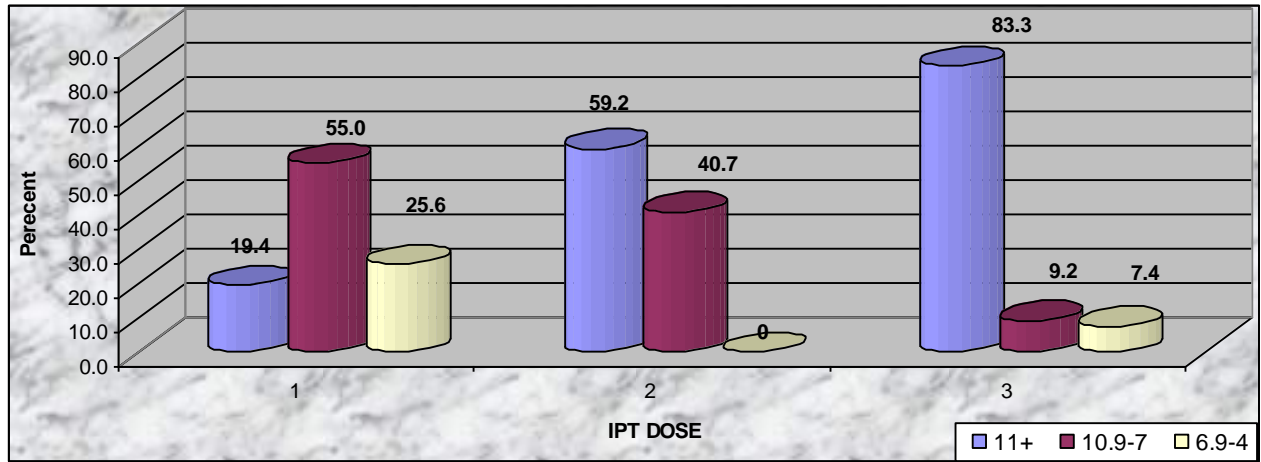


4.8 IPT RECEIVED AND HAEMOGLOBIN LEVELS

The study has shown a strong association between IPT dose received and the haemoglobin levels among pregnant women in the municipality. Whiles the prevalence of mild/moderate anaemia (Hb 10.9-7g/dl) was 55% among pregnant women who received only the 1st dose of IPT, this has significantly dropped to 9.2% ($p < 0.001$) among those who received the 3rd dose. It is also indicated that normal haemoglobin levels (Hb 11+g/dl) have improved among pregnant women increasingly with the 3rd dose of IPT. Whiles 19.4% of those who took the 1st dose of IPT 1 had haemoglobin levels 11g/dl and

above, 83 % ($p < 0.001$) of those who received the 3rd dose had normal haemoglobin levels as shown on figure 9.

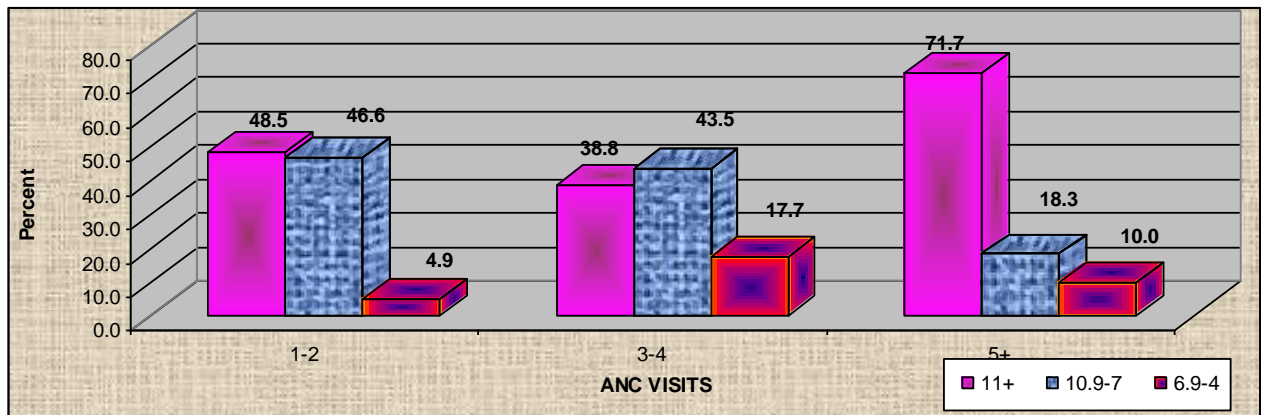
Figure 9: Haemoglobin levels and IPT in pregnant women



4.9 ANC VISITS AND HAEMOGLOBIN LEVELS

The study has shown that haemoglobin levels have improved significantly among pregnant women who made 5 ANC visits and more compared to those who made between 1 and 2 ANC visits. While 40% of pregnant women who made between 1 or 2 visits had normal haemoglobin levels, this has increased to 71.7% ($p < 0.001$) among those who made 5 or more ANC visits. Mild/moderate anaemia have also dropped from 46.4 % to 18.3 % ($p < 0.001$) in those who made between 1 or 2 visits and 5 or more visits respectively in 2007 as shown on figure 10.

Fig. 10: ANC visits and Haemoglobin levels among pregnant women



4.10 COUNSELLING ON ANAEMIA CONTROL

Counselling is an integral component of ANC services in all health facilities in the municipality. Key information to be provided in the counselling session includes: benefits, dosage and side effects of the iron supplements, sleeping under ITN, iron rich foods, and date for the next ANC clinic (GHS 2003).

Findings from the study at the counselling sessions have shown that 75% of attendants were provided with some level of counselling at the ANC clinic. However, providers provided no information to pregnant women on the dosage, benefits and side effects of the iron supplement. 10% of ANC attendants are counselled on the scheduled date for their next ANC visit, 20% on the need to sleep in ITN and 60% on iron rich foods and the need to include them in their diet. On the average, only 16.3% of relevant information was provided to pregnant women to change behaviour in preventing anaemia among pregnant women in Ejisu/Juaben municipality as shown on table 1.

Table 1: Counselling on anaemia control at ANC clinic

	INDICATOR	Yes		No		Total	
		No.	%	No.	%	No.	%
1	Client informed she will receive iron supplements	7	35	13	65	20	100
2	Client informed on the benefits of iron supplements	0	0	20	100	20	100
3	Client informed on the dosage of the iron supplements	0	0	20	100	20	100
4	Client informed on the side effects of the iron supplements	0	0	20	100	20	100
5	Client informed on the next date of her visit to the clinic	2	10	18	90	20	100
6	Client informed on the need to sleep in ITN	4	20	16	80	20	100
7	Client informed on Iron rich foods	12	60	8	40	20	100
8	Service provider checked for client's understanding of the information	1	5	19	95	20	100
	Total	26	16.3	134	83.8	160	100

4.11 PROGRAM MANAGEMENT

All midwives in-charge in all facilities in the municipality have had training in anaemia control in pregnancy. But after the initial training organized for all midwives, Public Health Nurses and Nutrition Officers, the Municipal Health Management Team (MHMT) did not organize any in-training during the 4 year period for service providers on the program including newly qualified midwives.

Even though data is collected through the monthly midwife returns on the haemoglobin level of pregnant women attending the ANC clinics, these are not analysed and used for monitoring the program. Prevalence of anaemia is not include in indicators for monthly MHMT meetings, quarterly, bi-annual and annual performance review meeting.

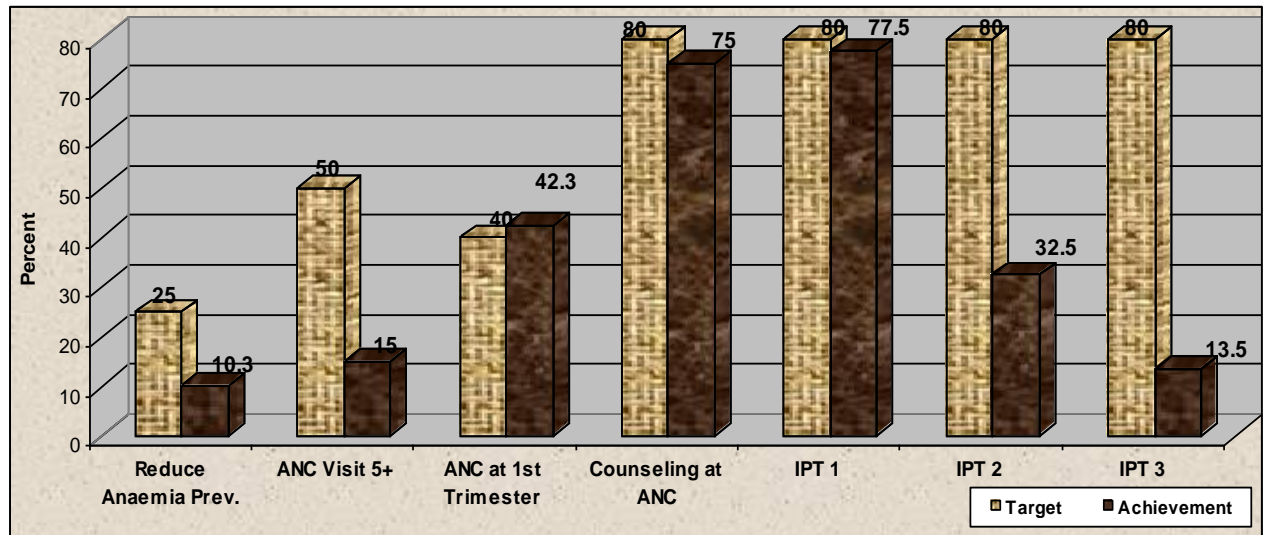
The MHMT has a quarterly supervisory visit schedule for all facilities and sub municipalities. However, supervision of the anaemia program was not integrated into the quarterly MHMT facilitative supervisory visit to the sub municipalities and health institutions.

Procurement of program logistics was however done on regular basis by the MHMT and all institutions and therefore there was no stock out in the past 6 months. The Ghana malaria control program also supplies SP to all facilities through the MHMT on regular basis and therefore stock levels are adequate during the past six months.

4.12 SUMMARY OF PROGRAM ACHIEVEMENT

Even though some gains were made in the past four years of the intervention in the municipality, generally, the objectives of the anaemia control program are not met with almost all the indicators as indicated on figure 11 below.

Fig. 11: Targets and achievements of the anaemia control program



The Municipality achieved 7.5% and 10.3% reduction in the prevalence of anaemia (Hb<11g/dl) at registration and 36 weeks respectively compared to program's target of 25% reduction.

The proportion of pregnant women making 5 or more ANC visits was 15% compared to the 50% target set by the program. 77.5%, 32.5% and 13.5% of pregnant women received the 1st, 2nd, and 3rd doses of IPT respectively compared to the 80% target set for the program. At the ANC clinics, 75% of pregnant attendants were given some form of counselling on anaemia control compared to the 80% target set for the program. However, on the average, only 16.3% of the key messages were provided to the pregnant women making the quality of the behavioural change communication (BCC) poor.

All logistics for the program are procured and stocked on regular basis at all health facilities. There was no in-service training during the program period and monitoring of the program was not integrated into the Municipal Health Directorate's monitoring schedule.

CHAPTER FIVE

5.0 DISCUSSIONS

Anaemia continues to be a major cause of maternal and infant mortality in Ghana and the developing world in general. Achieving the Millennium Development Goal (MDG) is 5 is largely depended on pragmatic interventions including preventing anaemia among pregnant women. Hence, the objective of the “Integrated Strategy for the control of anaemia in Ghana” to reduce anaemia among pregnant women by 25% in the country by 2007 cannot be overemphasized.

5.1 PREVALENCE OF ANAEMIA

The study has indicated that mild/moderate anaemia (Hb 10.9-7 g/dl) at registration has dropped from 47.5% to 40.5% ($p < 0.001$) in 2003 and 2007 respectively while severe anaemia (6.9-4 g/dl) has also dropped marginally from 13.7% to 13.2%. Therefore, between 2003 and 2007, there was a reduction of 7.5% in the prevalence of anaemia in pregnant women at registration in the municipality. However, at 36 weeks of gestational period, mild/moderate anaemia dropped from 47.8% to 39.5% ($p < 0.001$) while severe anaemia (Hb 6.9-4 g/dl) has dropped by 1% (10% to 9%). Therefore anaemia (Hb < 11 g/dl) has dropped by 7% and 10.3% at registration and 36 weeks respectively between 2003 and 2007 in the municipality. The objective of the anaemia control program was to reduce anaemia among pregnant women by 25% by 2007 (GHS 2003). Even though the program target was not met, the prevalence of anaemia among pregnant women attending ANC in the municipality is relatively lower compared to the national ([Mockenhaupt FP, Rong B, 2000](#)) and sub regional (WHO 2005) prevalence.

The prevalence of mild/moderate anaemia (Hb 10.9-7 g/dl) at registration ranges between 28.7% in Juaben and 52.7% in Ejisu while normal Hb levels (Hb 11+ g/dl) also range

between 34% in Ejisu and 64% in Tikrom. Juaben also recorded the lowest (5.3%) prevalence of severe anaemia (Hb 6.9-4 g/dl) while Kwaso recorded the highest of 20% during the period. These findings of the study are indications of ineffectiveness of the anaemia control program in the municipality since only 30% and 37.2% of the program targets are achieved at registration and 36 weeks of pregnancy respectively.

As the main outcome indicator of the program, it indicates that the program has performed fairly in the municipality. Since anaemia constitutes significantly to maternal death in the developing world including Ghana and the study area, more pragmatic efforts are needed in order to reduce anaemia among pregnant women in the municipality to reduce maternal mortality. Specific activities outlined in the program protocol to achieve this set objective are: capacity building for health and community based workers; ensure access to iron/folate supplements, sulfadoxine pyrimethamine (SP), and anti-helminthic; ensure suitable information, education and communication (IE&C) at ANC clinics and to supervise, monitor and evaluate the program regularly (GHS 2003).

The study has found that there was a regular supply of all the program drugs in all the facilities in the municipality. However, behavioural change communication at the ANC clinics, capacity building and monitoring and supervision components were very ineffective in the municipality.

Since anaemia in pregnancy is a major cause of maternal mortality, failures to reduce anaemia among pregnant women will have a very high negative impact on the achievement of the Millennium Development Goal 5.

5.2 TRIMESTER AT REGISTRATION AND ANC VISITS

Ante Natal Care services are a vital health care service for the implementation of strategies for preventing anaemia among pregnant women. Services provided at ANC

towards the prevention of anaemia include screening for malaria parasites, haemoglobin levels, worm infestation and other risk factors during pregnancy. Iron supplements, dewormers and IPT are provided to all pregnant women attending the clinic in addition to nutrition education. The objective of the anaemia control program is to increase the proportion of pregnant women in their first trimester that made their first visit to the ANC to 40% by 2007(GHS 2003). The program also targeted increasing the proportion of pregnant women visiting the ANC clinic 5 times or more to 50%.by 2007. The evaluation study has however found an insignificant increase in ANC clinic attendance in the municipality between 2003 and 2007. The proportion of pregnant women making 3 to 4 visits have increased from 56.3% to 59.3% in 2003 and 2007 while those making 5 and more visits have also increased marginally from 14.3% to 15%. In sub-Saharan Africa, 68% of the pregnant woman makes only one ANC visit([World Health Organization/UNICEF 2003](#)) compare to 25.8% found in this study.

Out of the 400 pregnant women sampled for each of the periods (2003 and 2007) for comparison, 43.5% had the first attendance at the ANC clinic during their first trimester in 2003 and this has reduced slightly to 42.3% in 2007. However, the proportion of pregnant women registering in the 2nd trimester has increased from 40.8% to 44% while those having their first attendance in the 3rd trimester have dropped from 15.8% to 13.8% in 2003 and 2007. This finding agrees with the 50% quoted by WHO (([World Health Organization/UNICEF 2003](#)) as the proportion of pregnant women registering in the 2nd trimester. The study however indicates that the program did not meet these set objectives also. ANC registration in the 1st trimester has dropped by 1.2% while the average number of pregnant women making 5 visits and above has increased slightly (0.7%) between 2003 and 2007. Even though the program target is not met, the overall coverage of 42.3%

registration of pregnant women during the first trimester is above the National target of 40 % (GHS 2003)

Registration for ANC services in the first trimester of pregnancy is vital to ensure the maximum number of visits during the gestation period. This provides an excellent opportunity to implement malaria and anaemia prevention strategies during pregnancy.

The study therefore shows a significant association between ANC visit and haemoglobin status. Haemoglobin levels have improved significantly among pregnant women who made 5 ANC visits and more compared to those who made between 1 and 2 ANC visits. While 40% of pregnant women who made between 1 and 2 visits had normal haemoglobin levels, this has increased to 71.7 % ($p < 0.05$) among those who made 5 or more ANC visits. Mild/moderate anaemia has also dropped from 46.4 % to 18.3% in those who made between 1 or 2 visits and 5 or more visits respectively in 2007.

The study also shows a strong association between ANC visits and intermittent preventive treatment for malaria (IPT) among pregnant women. Only 8% of pregnant women who made between 3 and 4 ANC visits had the 3rd dose of IPT compared to 40 % ($p < 0.05$) of those who made 5 and more visits. Early registration at the ANC clinic is therefore vital for prevention of anaemia in a pregnant woman due to the fact that the pregnant woman is more likely to take more iron supplement, receive the three doses of IPT and more information from the clinic on diet to control anaemia. (World Health Organization/UNICEF 2003) Since the early registration at ANC affects average attendance, it is vital indicator for reducing anaemia among pregnant women. Low achievement in this process indicator therefore affects the achievement of the outcome indicator of the program. In view of this, stake-holders in the municipality need to work

towards increasing early registration at the ANC clinic by pregnant women in the municipality.

5.3 INTERMITTENT PREVENTIVE TREATMENT (IPT) OF MALARIA

Malaria during pregnancy causes rapid breakdown of the red blood cells therefore suppressing the process of erythropoiesis. This is a major cause of anaemia among pregnant women in malaria endemic regions. Maternal and infant deaths are some major consequences of malaria in pregnancy.

The objective of the program is that 80% of all pregnant women should receive preventive treatment malaria using sulfadoxine pyrimethamine(SP) by 2007. The study has shown that there was a significant drop in the proportion of pregnant women taking the 1st, 2nd and 3rd doses of IPT in 2007. While 77.5% of pregnant women attending ANC clinic in the municipality have received the 1st dose of IPT, only 32.5% and 13.5% have received the 2nd and 3rd doses respectively. In a study conducted in Kenya (Anna M. van Eijk et al 2007) only 44.8% and 26.5% of pregnant women received the 1st and 2nd doses of IPT respectively. Even though this study indicated a high drop out rate of 64%, IPT intake is better than what is recorded Kenya.

Under the program, a pregnant woman attending ANC clinic is to take 3 doses of sulfadoxine Pyrimethamine(SP) under the observation of the midwife starting from the 16th week. All pregnant women are to be provided insecticide treated net at a subsidized price and encouraged to sleep in it on regular basis. Early registration at the ANC clinic is a vital factor for taking the full dose of SP. The evaluation shows that 44% and 13.8% of ANC attendants register in the 2nd and 3rd trimester respectively.

The objective of the program for IPT which is 80 % (GHS 2003) is therefore not met since only 13.5% took the 3 doses even though 77.5% of pregnant women attending ANC clinics took the first dose. The 13.8% registration in the 3rd trimester also explains why 22.5% of attendants did not take even the first dose of IPT.

The study has also shown a strong association between IPT dose received and the haemoglobin levels among pregnant women in the municipality. While the prevalence of mild/moderate anaemia (Hb 10.9-7g/dl) was 55% among pregnant women who received only the 1st dose of IPT, this has significantly dropped to 9.2 % ($p < 0.001$) among those who received the 3rd dose. It is also indicated that normal haemoglobin levels have improved among pregnant women increasingly with the 3rd dose of IPT. While 19.4% of those who took the 1st dose of IPT had normal haemoglobin levels ($11+ \text{ g/dl}$), 83 % ($p < 0.001$) of those who received the 3rd dose had normal haemoglobin levels. Preventive treatment of malaria using SP is therefore a vital tool in the anaemia control program since it reduces placenta parasitaemia and the resultant reduction in haemoglobin levels in the pregnant woman (Anna M. van Eijk et al, 2007)

Even though the MHMT and the head of the various institutions are paying their management role effectively in this direction by procuring and stocking the facilities with sulfadoxine Pyremethamine, achievement for the 2nd and 3rd doses are very low compare to the program target of 80% (GHS 2003). The study indicated a strong association between gestational period of registration and IPT dosage. While 47.3% those who registered in the 3rd trimester had only the 1st dose of IPT, only 18.2% had the third dose. This means that pregnant women should be encouraged to register early to enable them make maximum visits and receive all the 3 doses of IPT.

5.4 BEHAVIOURAL CHANGE COMMUNICATION AT ANC CLINICS

The role of an individual is a vital factor in achieving good health status. Hence, positive and healthy behaviour of a pregnant woman can not be overemphasized in reducing anaemia. Effective behavioural change communication through counselling at the ANC clinic is the main strategy for achieving this objective.

The objective of the anaemia control program (GHS 2003) is to counsel 80% of pregnant women attending ANC clinics on anaemia control (GHS 2003). The key messages in a counselling session includes: Informing the client that she will receive iron supplements; informing the client on the dosage, benefits and the side effects of iron supplements. The rest are counselling on the next date of her visit to the clinic and sleeping in ITN and eating iron rich foods (GHS 2004).

Findings from the study through an observation at the counselling sessions at ANC clinics have shown that 75% of clients are provided some information on anaemia control. However, all service providers (midwives) provided no information to pregnant women on the dosage, benefits and side effects of the iron supplement. 10% of ANC attendants are counselled on the scheduled date for their next ANC visit, 20% on the need to sleep in ITN and 60% on iron rich foods and the need to include them in their diet. On the average, only 16.3% of the relevant required information is provided to pregnant women to enable them make positive behavioural change in preventing anaemia in Ejisu/Juaben municipality. The program has also developed different types of posters as an effective communication tools for transmitting health information. Observation at the facilities indicates that no poster on anaemia control in pregnancy is posted in any of the health facilities in the municipality. Group health education talks are given at the commencement of ANC clinics at all the facilities and only 25% of facilities in the

municipality have a well organized and effective counselling sessions as an integral part of the ANC clinic process.

Lack or ineffective counselling at ANC clinic has very negative effect on anaemia control among pregnant women. A pregnant woman needs to sleep in an ITN and take her iron supplements daily. These depends largely the health behaviour of the client and this depends on the how informed she is on her health needs. Regular attendant at the clinic cannot be overemphasized in benefiting from all the services intended to reduce anaemia in the pregnant woman. Nutrition counselling is very important for pregnant women to acquire knowledge and adopt healthy dietary habits to maintain normal haemoglobin levels. For the program to achieve its objective of reducing anaemia by 25%, the MHMT must work had to improve the Information, Education and Communication (IE&C) component of the program.

5.5 MANAGEMENT FUNCTIONS

Management plays a vital role in achieving the objectives of any intervention program. Hence, the effective implementation of the anaemia control program depends largely on fulfilling the management functions of the Municipal Health Management Team as enumerated in the program protocol (GHS 2003). The management functions includes: procurement and stocking of health facilities with program drugs; in-service training for service providers and supervision.

All midwives in-charge in all facilities in the municipality have had training in anaemia control in pregnancy. But after the initial training organized for all midwives, Public Health Nurses and Nutrition Officers in the region by the Regional Health Directorate, the Municipal Health Management Team (MHMT) did not organize any refresher training during the 4 year period for service providers on the program including newly

qualified midwives. Data entry into the ANC register was poorly done in 75% of facilities in the municipality and the service providers did not have a copy of the training manual available for reference. All the facilities in the municipality did not use the guidelines in the program protocol for management of severe anaemia. Rather, they all prescribe Vitafol and feroglobin for the management of severe anaemia (Hb 4-6.9 g/dl) contrary to the training guidelines (GHS 2004).

Monitoring and supervision are very vital management function intended to keep track of an objective of any intervention strategy. Even though data is collected through the monthly midwife returns on the haemoglobin level of pregnant women attending the ANC clinics, these are not analysed and used for monitoring the program. Prevalence of anaemia was not include in indicators for monthly MHMT meetings, quarterly, bi-annual and annual performance review meeting.

The MHMT has a quarterly supervisory visit schedule for all facilities and sub municipalities. However, supervision of the anaemia program was not integrated into the quarterly MHMT facilitative supervisory visit to the sub municipalities and health institutions. Data entry into the ANC was poorly done in 75% of the facilities, haemoglobin test at 36 weeks was not entered into the register for most pregnant women who did the test and all service providers manage severe anaemia with Vitafol or Feroglobin which are not in the essential drug list. The MHMT could address the service related issues though integrating the program into the quarterly sub municipal and facility facilitative supervision. Procurement of program logistics was however done on quarterly basis by the MHMT and the all institutions. The Ghana malaria control program also supplies SP to all facilities through the MHMT on regular basis and therefore stock levels are adequate during the past six months.

5.6 LIMITATIONS OF STUDY

5.6.1 DATA TYPE

Improper organization of data in the ANC register was a major constrain in the study. The same set of data was recorded differently into the register in different health institutions which does not conform to the design of the register. This calls for extensive search of the required data through the register. Also, if enough time were available, the monthly midwives returns should have been used to ensure the validity of the data in the ANC register. Secondary data from the ANC register was not enough to completely evaluate the effectiveness of the anaemia control program in the municipality. There were other objectives of the program related to the daily intake of iron supplements by the pregnant women until 6 weeks after delivery, sleeping in insecticide Impregnated Nets(ITN), and deworming of pregnant women. These information are not entered into the register but on the ANC card which is kept by the client herself. To collect data on this therefore, there was need to trace all pregnant women whose data was collected from the ANC register to interview them. However, due to time and financial constrain this could not be done. I therefore recommend that a community study be done to determine a complete performance of the program.

5.6.2 TIME CONSTRAINTS

Another major limitation of this study was the short time frame for all the processes involved in the data collection. This did not allow for proper organization and effective coordination of data collection and scrutiny as well as verification of some of the data. Had there been enough time, data on all the process indicators of the program would have been collected to have a holistic view the performance of the program.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The Municipality achieved 7.5% and 10.3% reduction in the prevalence of anaemia (Hb < 11g/dl) at registration and 36 weeks respectively compared to program's target of 25% reduction. The proportion of pregnant women making 5 or more ANC visits was 15% compared to the 50% target set by the program. 77.5%, 32.5% and 13.5% of pregnant women received the 1st, 2nd, and 3rd doses of IPT respectively compared to the 80% target set for the program and 75% of pregnant attendants were given some form of counselling on anaemia control compared to the 80%. However, on the average, only 16.3% of the key messages were given to each participant making the quality of the behavioural change communication (BCC) poor. Relevant logistics were available. There was no in-service training during the program period and monitoring of the program was not integrated into the Municipal Health Directorate's monitoring schedule.

Anaemia in pregnancy leading to maternal and infant mortality continues to be a major public health concern in Ghana. This has a negative impact on the country's Human Development Index (HDI) and the achievement of the Millennium Development Goal (MDGs) 4 and 5. To achieve the objective of reducing anaemia among pregnant women in the municipality as a major strategy in achieving the MDGs, the following recommendations are made.

6.2 RECOMMENDATION

In order to address the gaps identified in the study in relation to the set objectives, the following recommendations are made:

6.2.1 REDUCTION OF THE HIGH PREVALENCE OF ANAEMIA: In order to achieve the program's objective of reducing anaemia, I recommend the following actions:

6.2.1.1 In-service Training: The Municipal Health Directorate should organize regular in-service training for all safe-motherhood service providers on the subject matter. This is very essential to up-date their knowledge and skills in preventing anaemia among pregnant women

6.2.1.2 Training curriculum for midwives: Newly qualified midwives have limited knowledge on the program. It is therefore recommended that the training module on anaemia control in pregnancy be included into the training program in all midwifery institutions in the country. This will prepare the midwives with enough knowledge and skills to contribute towards anaemia reduction after graduation from school.

6.2.1.3 Orientations on rational drug use. Service providers are prescribing other iron supplements such as Vitafol, Pregcare, Feroglobin among others. These drugs are not on the Essential Drug List (EDL) and also contain less elemental iron compared to Forsolate which is recommended by the program. Since the recommended daily supplementation is very essential for the prevention of anaemia among pregnant women. All prescribers and other service providers should be sensitized to prescribe iron supplements from the Essential Drug List only. They should be discouraged from prescribing other iron supplements such Vitafol, Pregcare and Feroglobin

6.2.2 INCREASE UTILIZATION OF ANC SERVICES. In order to achieve the program's objective of increasing ANC registration in the 1st trimester and increasing ANC visits pre pregnant woman, I recommend the following actions:

6.2.2.1 ANC outreach Services: To increase access to, ANC services should be integrated into the monthly CWC outreach programs and this must be managed by a Community Health Nurse Midwife on the team.

6.2.2.2 Staffing of maternity units. The heavy workload at the ANC clinics is aggravated by the implementation of the free ANC and delivery policy coupled with inadequate skilled staff at the unit. This is preventing the few midwives from conducting focus ANC thus affecting the quality of care at the clinics including counselling. More midwives should be recruited to commensurate with the ANC attendance and the workload.

6.2.3 SCALE UP IPT OF COVERAGE. In order to achieve the program's objective of increasing the proportion of pregnant women taking the 3 doses of IPT, I recommend the following actions:

6.2.3.1 Collaboration with Private Health Providers: Sulfadoxine Perimethamine(SP) should be supplied to all providers including private institutions regularly.

6.2.3.2 Increase Access to ANC services: ANC services should be organised as part of the monthly outreach program to encourage registration at early stage of pregnancy and promote maximum attendance. This could increase IPT 2 and 3 coverage.

6.2.4 BEHAVIOURAL CHANGE COMMUNICATION (BCC): I recommend the following actions to be taken in order to achieve the program's objective of providing quality information to pregnant women attending ANC clinics in the municipality:

6.2.4.1 Counselling desk: About 75% of facilities in the municipality do not have counselling desk as an essential process of the ANC clinic. This has resulted to unplanned, poor quality and ineffective counselling sessions. There should be a

counselling desk as an essential part of the ANC clinic and all pregnant women attending ANC clinics must be counselled.

6.2.4.2 Provision of IE&C materials: In order to increase awareness among individuals and families using the health facilities, Information, Education and Communication (IE&C) materials such as posters should be posted at all health facilities in the municipality. Counselling cards should be provided to all midwives and other service providers to facilitate effective counselling at the ANC clinics in the municipality. The MHMT could also contact Ghana Sustainable Change Program (GSCP) to acquire additional IE&C materials.

6.2.4.3 Training on Counselling: The MHMT should organise an in-service training for all safe motherhood service providers on counselling skills. The counselling card designed by the program should be provided to all service providers. The MHMT should provide training guidelines and protocols to all health institutions in the municipality and encourage midwives to place them on their tables for easy reference.

6.2.5 STRENGTHENING MANAGEMENT ROLES: The following management roles are recommended to ensure the effectiveness of the program:

6.2.5.1 Monitoring and Supervision: Monitoring and supervision is very vital for the success of the program. The outcome indicator should feature prominently on all the periodic report formats. It must be given equal priority as to coverage such as immunization, Family planning, supervised delivery among others. Supervision from the Regional, Municipal, and Sub municipal levels should be strengthened and firmly integrated into the routine supervisory visits organized at all these levels.

6.2.5.2 In-service training: The MHMT should organise regular in-service training for all service providers on anaemia control as part of the High Impact Rapid Delivery (HIRD) strategy to achieve MDG 4 and 5.

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APPENDICES

APPENDIX 1: PARTICIPANT’S CONSENT

EVALUATION OF THE NATIONAL PROGRAM OF ANAEMIA CONTROL IN PREGNANT WOMEN IN EJISU-JUABEN DISTRICT

You have been selected to participate in a study which is evaluating the anaemia control in pregnancy program in Ejisu-Juaben Municipality.

The Principal Investigator is a student from the School of Public Health, University of Ghana and he will conduct the study in 3 months period.

Information from the study will be used to make recommendations to stake- holders to improve on save motherhood services to reduce maternal and infant death thus achieving the Millennium Development Goals 4 and 5.

All information you will provide during the interview will be treated strictly confidential.

Your participation in the study is voluntary and optional and therefore you can decide to participate or not.

.

Thank you,

.....
Name of Interviewer

.....
Signature of Interviewer

Participant: I have carefully read the consent form and understood all the information therein. I have therefore given my full consent to participate in the study.

.....
(Name of Participant/Interviewee)

.....
Signature of participant/Interviewee

APPENDIX 2: DATA EXTRACTION FORM FROM ANC REGISTER

EVALUATION OF ANAEMIA CONTROL IN PREGNANCY PROGRAM IN EJISU-JUABEN MUNICIPALITY

(ANC REGISTER RECORDS REVIEW)

1	ID		
2	Name of sub Municipality		
3	Registration No.		
3	Name of Institution		
4	Name of Interviewer		
5	Date		

DEMOGRAPHIC DATA

No	Variable	Response	Data Entry
6	Name of Participant		
7	Age	10-14.....1 15-19.....2 20-34..... 3 35+.....4	
8	Parity	0.....1 1-2.....2 3-4.....3 5+.....4	
9	Trimester at Registration	First.....1 Second.....2 Third.....3	

PROGRAM PROCESS AND OUTCOME

No	Variable	Response	Data Entry
10	Haemoglobin at Registration	11+g/dl.....1 7-10.9g/dl.....2 4-6.9g/dl.....3	
11	Haemoglobin at 36 weeks	11+g/dl.....1 7-10.9g/dl.....2 4-6.9g/dl.....3	
12	Number of ANC visits	1-2.....1 3-4.....2 5+.....3	
13	IPT: 1 st dose	Yes.....1 No.....2	
	2 nd dose	Yes.....1 No.....2	
	3 rd dose	Yes.....1 No.....2	

APPENDIX 3: In-depth Interview Questionnaire for Midwives

EVALUATION OF ANAEMIA IN PREGNANCY PROGRAM IN EJISU-JUABEN MUNICIPALITY			
(In-dept Interview with Midwife In-Charge)			
NAME OF INSTITUTION.....		TYPE OF FACILITY.....	
Name/ Designation of Interviewee.....			
Name of Interviewer.....		Date.....	
<i>Please I am going to ask you questions on the in-service trainings you attended on anaemia control, working tools available and the services you provide to control anaemia among pregnant women</i>			
	VARIABLE	RESPONSE	DATA ENTRY
IN-SERVICE TRAINING			
1	Have you benefited from any in-service training on anaemia control in pregnancy in the last 4 years?	1. Yes 2. No	
2	If yes, how many sessions have attended in the last 4 years?	1. 1-2 2. 3-4	
3	When was the last time you attended a training session on this program?	1. 6months ago 2. 1 year ago 3. 2 yrs ago	
GUIDELINES/PROTOCOL			
4	Have you ever seen a copy of the anaemia management protocol?	1. Yes 2. No	
5	If yes, do you have a copy of the guidelines/protocol in this facility? (<i>ask for a copy</i>)	1. Yes 2. No	
SERVICE PROVISION			
6	What type of iron supplements is given/prescribed to pregnant women in facility?	1. Fersolate/Folic acid	
		2. Pregcare	
		3. Vitafol	
		4. Feroglobin	
		5. Others(specify)	
7	Do all pregnant women receive IPTp	1. Yes 2. No	
8	Do you always have SP in-stock?	1. Yes 2. No	
9	If no, when did you have the last stock out?	1. 1-2 months ago 2. 3-4months ago 3. 6months ago	
9	Do you deworm all pregnant women?	1. Yes 2. No	
10	If no, which ones do you deworm?	1. Those in 2 &3 trimester	
		2. Stool test +ve	
		3. Other(specify)	

APPENDIX 4: In-depth Interview Questionnaire for In-charges

EVALUATION OF ANAEMIA IN PREGNANCY PROGRAM IN EJISU-JUABEN MUNICIPALITY			
(In-dept Interview with Head of the Institutions)			
NAME OF INSTITUTION.....TYPE OF FACILITY.....			
Name/ Designation of Interviewee.....			
Name of Interviewer.....Date.....			
<i>Please I am going to ask you questions on your roles as a manager in the implementation of the program-procurement, training and supervision.</i>			
	VARIABLE	RESPONSE	DATA ENTRY
PROCUREMENT OF LOGISTICS AND DRUGS			
1	How often do you make requisition for supplies including routine drugs for pregnant women?	1.Monthly 2. Quarterly 3. Other (specify)	
2	Do you ever experience shortages of these tablets?	1.Yes 2.No	
3	Are you experiencing any stock out of any of these items at this moment?	1.Yes 2.No	
4	Have there been any stock outs of any within the past six months?	1.Yes 2.No	
5	What are your minimum stock levels for: Sulfadoxine Perimethamine(SP) Albendazol Fersolate Folic Acid		
6	What are your actual stock levels for: Sulfadoxine Perimethamine(SP) Albendazol Fersolate Folic Acid		
IN-SERVICE TRAINING			
7	Have you organized any training on anaemia control in pregnancy in past 12months?(verify with report)	1.Yes 2.No	
8	If yes how many RCH staff have you trained?		
FACILITATIVE SUPERVISION			
9	Is the program included in regular supervisory visits to the Sub metros and facilities?(verify with checklist)	1.Yes 2.No	
10	If yes, when was the last time you supervised the program? (Verify with supervisory Report)	1. 1-3 months	
		2. 4-6 months	
		3. >6Months	

APPENDIX 5: Observational checklist for Counselling

EVALUATION OF ANAEMIA IN PREGNANCY PROGRAM IN EJISU-JUABEN MUNICIPALITY

OBSERVATION CHECKLIST

Sub-District: _____

Type of facility: _____

Category of staff: _____

Observation

Observe health worker during the Ante-natal session for how she/he interacts with client and what she tells client about iron/folate supplements.

Observer counselling of 5 clients and summarize the general observation in the summary column

1. Health worker tells client

No.	Question and Filters	CLIENT					
		C1	C2	C3	C4	C5	Summary
01	Tells client that she is receiving/will receive Iron/folate tablets	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
02	Tells client the benefits of iron/folate	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
03	Tells client how often to take tablets	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
04	Tells client about possible side effects constipation	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
05	Tells client when she will next receive supply (In 2 or 4 weeks time)	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
06	Tells client how to take tablets (with water)	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
07	Tells client to sleep in ITN	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
08	Tells client to eat iron rich foods and fruits daily	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
09	Checks whether mother has understood any of the instructions	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
10	Asks if another has any of mothers responses to instructions	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

2. Any anaemia control poster on the walls of the institution. 1) Yes 2) No

3. If yes how many different types. 1) 1 2)2 3)3+

