FACTORS ASSOCIATED WITH PREGNANCY OUTCOME AMONG ANC CLINIC ATTENDEES IN ODEDA LGA OF OGUN STATE

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DEDICATION

This work is dedicated to the loving memory of my *nulli secundus* mother, Late **Madam KOSENAT ADUNNI SORUNKE (Nee Mosuro)** for bequeathing in me the sense of love, diligence and service to humanity during her short but memorable sojourn on earth.

May her gentle soul continue to rest in the bosom of the LORD. Amen.

ABSTRACT

The concept of antenatal care has been universally-recognized as a very good model of preventive health care. Over the years, it has impacted positively on improving birth-outcomes in many countries. However, this has not been the case here, as Nigeria still maintains her place among countries with enormous loss of lives through pregnancy. This informed the present retrospective cross-sectional study to determine which socio-demographic, obstetric and other factors are associated with low birth-weight deliveries, an adverse pregnancy outcome.

The study area, Odeda Local Government Area, is essentially a rural LGA in Ogun State with an estimated population of over 100,000. The study population comprised pregnant women attending antenatal care (ANC) clinics in two of the LGA's Health Facilities at Obantoko and Orile-Ilugun within the 3-year period starting July 2004 – June 2007. A total 416 of the registered pregnant women were surveyed using prepared structured checklist for collecting data from subjects' ANC cards and delivery records. Data were analysed using SPSS software. Frequency tables were generated, and chi-square test used to investigate associations between categorical variables at 5% significance level.

Of the 416 subjects, majority (69.4%) were aged 20 – 29 years, and 6.7% were teenagers. Their mean age was 25.5 ± 5.3 years while their spouses' mean age was 33.5 ± 6.8 years. As at the time of their ANC booking, 93.5% were married, 70.4% had at least primary education, while 98.1% were low-income petty-traders and farmers. Mean number of pregnancies was 3.0 ± 1.8, mean parity was 1.9 ± 1.7, mean number of subjects' living children was 1.6 ± 1.4. Findings on ANC service utilization include mean number of ANC visits (3.5 ± 2.4), mean gestational-age-at-booking (2.17 ± 9.0), 45.5% ultrasound scan usage, and 61.5% Tetanus Toxoid immunization coverage. Mean gestational age at labour was 38.2 ± 3.4 weeks; male : female babies' sex ratio was approximately 1.5 : 1.0, while low birth-weight prevalence found was 3.4%. Following multivariate analysis, factors that significantly increased the risk of low birth-weight deliveries among booked pregnant women include being a teenage mother [O.R = 48.6; (C.I = 5.3 – 440.5); p< 0.005]; and being a never-married mother

[O.R = 70.4; (C.I = 9.7 – 512.6); p< 0.005)]. Early booking for ANC i.e. before 28 weeks [O.R = 0.1; (C.I = 0.01 – 0.56); p< 0.05], and attaining term pregnancy prior to labour [O.R = 0.02; (C.I = 0.002 – 0.098); p < 0.005] were both significantly protective against low birth-weight. Attending ANC only once and receiving <2 doses of TT were both non-significant LBW risk factors.

A good number of pregnant women using public health facilities in Odeda LGA are accessing the inherent benefits of antenatal care services. They should be further encouraged to avoid teenage pregnancy and single parenthood, both of which had exposed them to low birth weights and similar adverse pregnancy outcomes.

ACKNOWLEDGEMENT

The successful completion of this work had been on the grace of the Almighty God. His precious Name be exalted.

I appreciate my wife Omotunde Aderemi, and my children, Abiodun Akorede and Oluwafemi Toluwanimi for their ever-present love and moral support throughout the duration of the course.

My special thanks go to Dr. Lola Adekunle who is my Supervisor and Adviser, for her kindness and pain-staking efforts that saw me through with the programme.

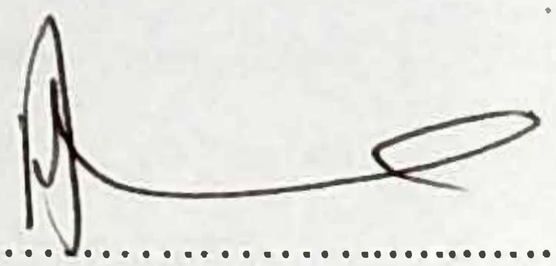
I also acknowledge most sincerely, the added care of my lecturers in the department, namely Dr. (Mrs.) Bidemi Yusuf, Professor Olusola Ayeni, Professor E.A. Bamgboye, Dr. Fatiregun, Dr. Adedokun, and indeed all the wonderful staff of EMSEH department.

My appreciation also goes to Mr Taiwo Oduola and Mr. Ayodele R. Adewole who handled the data analysis and other secretarial tasks involved.

My ever-merciful God shall continue to sustain you all, Amen.

CERTIFICATION

I certify that this research work was carried out by Dr. Abiodun M. Sorunke in the Department of Epidemiology, Medical Statistics and Environmental Health, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.



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CHAPTER ONE

INTRODUCTION

BACKGROUND INFORMATION

Complications of pregnancy and childbirth are the leading causes of deaths among neonates and women of reproductive age (W.H.O/W.H.S, 2008; F.M.O.H, 2007). Each day, the world looses fifteen hundred women while giving birth (UNICEF, 2009). In year 2000 alone, an estimated 529,000 women worldwide died from pregnancy-related complications (WHO/UNICEF/UNFPA, 2004), with over 99% of these global maternal deaths occurring in developing countries (Waltraven et al, 2000). Nigeria, Africa's most populous country, accounts for about 10% of these global casualties (Okaro et al, 2001). It is said that a woman in the sub-Saharan Africa for example, who gets pregnant is 75 times more likely to die as a result of this pregnancy than another pregnant woman in Europe or North America (Waltraven et al, 2000). Current estimates of maternal mortality ratio for Nigeria stand at 1,100 per 100,000 live births (W.H.O/World Health Statistics, 2008). Within the country, there exists a wide geographical disparity ranging from 166 per 100,000 live births in the south-west to a record 1,549 per 100,000 live births in the north-east (Federal Office of Statistics/UNICEF, 2000). Evidence also abounds showing that for every Nigerian woman that dies in pregnancy, between 15 and 20 others suffer from pregnancy-related debilitating conditions, some of which are known to have life-long sequelae (FMOH/NPHCDA, 2007).

In essence, both maternal morbidity and mortality pose major health challenge. and both have significant implications for the health, development, and survival of children. Fiscella (1995) found women who had no pregnancy care more likely to die during labour and delivery than women who had visited a prenatal clinic. Also, a number of studies carried out in developing and transitional countries have demonstrated that women who received pregnancy care tend to have reduced rates of preterm labour (Orvos et al, 2002), of low birth-weight babies (Orvos et al, 2002; Kapoor et al, 1985), and also of perinatal deaths (Kapoor et al,1985; McCaw Binns et al, 1994).

Majority of these life-threatening complications were found to have responded positively to the same interventions directed at reducing maternal mortality in many traditional societies. One of such interventions is skilled attendance by medically-trained personnel (i.e. a doctor, nurse or midwife) during pregnancy, at delivery and the following pueperium. This has been found to improve birth-outcomes, ensure safe delivery, and also reduce the likelihood of maternal death. Abou-Zahr & Wardlaw (2002) analyzed demographic and health surveys in 45 developing countries and reported a strong positive correlation between at least one ANC visit and skilled attendance at delivery. Women reporting at least 4 ANC visits were on the average 3.3 times more likely to deliver in a medical facility than other women (Abou-Zahr & Wardlaw, 2002). All these and other findings demonstrate that care given a woman prenatally, represents an opportunity to offer her information and services that can help improve her health and that of her infant.

MAGNITUDE OF THE PROBLEM

Among the common causes of visits at clinics and out-patient departments of Hospitals in Nigeria, pregnancy and childbirth account for 23.1% of all causes (National Health Policy/F.M.O.H, 1988); second only to infective and parasitic diseases like malaria, diarrheal diseases and respiratory infections (National Health Policy 1988). In Year 2000 alone, an estimated 3 million women were pregnant, 2.4 million of whom had live births.

Antenatal care (ANC), the care that a woman receives throughout her pregnancy, is important in helping to ensure that women and new-borns survive pregnancy and childbirth. The ANC period is one that offers a pregnant woman opportunities for receiving health information and services that can significantly enhance both her own health and that of her infant (WHO/UNICEF, 2003). Antenatal care thus appears to serve as a means of increasing the use of skilled attendance at delivery. This beneficial relationship is however weakest in sub-Saharan Africa, hence this region having the highest levels of maternal mortality ratio (900 per 100,000 live births) and neonatal mortality rate (40 per 1,000 live births) in the world (WHO/WHS, 2008).

In Nigeria for example, only 36% of child births are assisted by skilled attendants (even as low as 13% in the north-western region of the country) (N.D.H.S, 2003), hence the alarming current maternal mortality ratio of 1,100 per 100,000 live births. With skilled birth attendants backed by functional equipment and materials (like drugs), the pregnant woman is to a large extent, assured of basic obstetric care. In our environment where poverty is rife, and only about 10% of the population could afford three square meals a day (National Planning Commission, 2004), the issue of funds to settle health care bills is also important.

JUSTIFICATION OF STUDY

In most developed countries, pregnancies are planned, complications are few and outcomes are generally favourable for both mother and the infant. This is unlike in developing countries, particularly the sub-Saharan Africa, where adverse pregnancy outcomes reign supreme, in spite of the fact that various studies found a large proportion of pregnant women there reporting at least one ANC visit (van Ejik et al, 2006; Uzochukwu et al, 2004; WHO/UNICEF, 2003; Adekunle, 2002).

The observed disparity probably lends credence to the notion linking the health of a people to the peculiar socio-economic circumstances of that population, including its access to health care services.

The present study is an attempt to bring to the fore, those socio-economic peculiarities relating to safe motherhood indices at the primary health care level. Characteristically, about 80% of all community health issues/problems occur at the PHC level (Gofin and Gofin, 2005). It is therefore expected that the outcome of the present study will enrich the knowledge and skills of PHC workers in rendering maternal health care services capable of improving child survival at the grassroots. Health policy makers in the country will also be assisted to package evidence-based safe motherhood interventions vital to the attainment of the Millennium Development Goals 4 and 5 targeting mother and child survival (UN MDGs, 2000).

OBJECTIVES OF STUDY

Broad Objective:- To determine the factors associated with pregnancy outcome at the primary health care level.

Specific Objectives:

1. To determine the socio-economic and demographic characteristics of women receiving antenatal care in Odeda Local Government Area of Ogun State.
2. To study the level of antenatal care services' utilization by pregnant women in this LGA.
3. To identify the outcome of the pregnancy.
4. To evaluate the previous obstetric experience of the pregnant women
5. To identify those socio-demographic and obstetric factors influencing pregnancy outcome among the women.
6. To provide baseline data which could be useful in implementing future safe motherhood intervention programmes in the country.

CHAPTER TWO

REVIEW OF THE LITERATURE

2.1 EPIDEMIOLOGY OF REPRODUCTIVE HEALTH

Reproductive health, as defined by the international community, is "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes" (ICPD, 1994). Being an integrated approach to health and development needs, reproductive health has safe motherhood as one of its vital component areas. This comprises prenatal care, safe delivery, essential obstetric care, postpartum care, neonatal care and breast-feeding (FMOH, 2002). It also includes family planning information and services, as well as the prevention and management of reproductive tract infections particularly sexually-transmitted infections and HIV.

Safe Motherhood as a concept refers to a situation in which no woman going through the physiological processes of pregnancy and childbirth suffers any injury, or loses either her life or that of the baby.

Whereas maternal death has virtually become an extremely rare event in the developed world with many European and American countries reporting maternal mortality ratios of 5 to 10 per 100,000 live births, the opposite is the case in the developing countries (Rosenfield and Maine, 1985; Abou-Zahr and Wardlaw, 2001). Some of the least developed countries have recorded maternal mortality ratio figures more than 100 times that of the industrialized countries (Rosenfield & Maine, 1985; AbouZahr & Wardlaw, 2001). Disparities in infant deaths are not as wide, but still remain enormous, ranging from 5 to 100 per 1,000 live births (UNICEF, 2003; WHO/WHS, 2008).

The most recent estimate of annual global maternal deaths is 536,000 (WHO/WHS, 2008). Incidentally, most of these deaths are caused directly by such preventable but treatable medical conditions as haemorrhage (32.9%), prolonged / obstructed labour (17.5%), pregnancy-induced hypertension (16.7%), sepsis (10.9%), unsafe abortions (10.5%), and indirectly by malaria and anemia (11.5%),

(UNFPA/FMOH, 2003). It is said that for each maternal death caused by these conditions, about 30 other women suffer long-term (often debilitating) illnesses such as obstetric fistula and pelvic inflammatory disease (UNFPA/FMOH, 2003; UNFPA, 2003). Field studies have shown that hemorrhage, particularly during or after delivery kills very fast, within a time-span of 2-12 hours. It is often due to uterine atony, uterine tears or rupture, or abnormal position/early separation of the placenta.

Pregnancy-induced hypertension, known as pre-eclampsia in the early stages, is characterized by high blood pressure, fluid retention (oedema) and proteinuria usually occurring in the second and third trimesters of pregnancy (Villar and Bergsjo, 1997). An untreated pre-eclampsia can progress to eclampsia with attendant severely-high blood pressure, convulsion or cerebral hemorrhage. Maternal and perinatal morbidity and mortalitities due to pre-eclampsia / eclampsia occur mostly among women pregnant for the first time, high-parity women and those at extremes of maternal life, i.e below 18 and above 40 years age (Lee et al, 2000; Lawoyin and Ani, 1996). Also at a higher risk when compared with controls are women with high body mass index (BMI), blood group "O", as well as women who either had no antenatal care, or booked late for ANC (Lawoyin and Ani, 1996; Sundari, 1992). Aziz (1980) in a Sudanese study however found women having more than four children as being at the highest risk for every pregnancy-related complication except pre-eclampsia.

Pre-eclampsia/eclampsia remains one of the most common reasons for women to die during pregnancy (Walker, 2000), with black women being 3.1 times more likely to die from the syndrome as white women (Mackay et al, 2001). In the same vein, adverse perinatal outcomes associated with the disease (such as low birth-weights, stillbirths and perinatal deaths) were found to be higher in developing countries compared to the developed countries (Sahim and Gulmezoglu, 2003). Women who survive this disaster usually live the rest of their lives with such complications as paralysis, blindness and chronic hypertension from renal damage (Grimes et al, 2006).

It is worth stating that pregnancy-related deaths are clustered around labour and delivery (11-17%), as well as in the immediate post-partum period (50-71%). (Ronsmans and Graham, 2006). About 45% of the post-partum deaths actually take place within the first 24 hours of delivery. With focused ante-natal care supported by

accessible emergency obstetric care (EmOC) services, it is still possible to help the woman avert most of these unnecessary deaths (Rasch, 2007; UNFPA, 2003).

2.2 MATERNAL AND CHILD HEATH: Nigerian Perspective

Maternal health reflects a country's level of health care. It also shows the degree of respect for women's rights within the society, such as rights relating to education, nutrition, economic resources, decision-making, safe and healthy environment, among others.

Practical availability of these rights is quite fundamental if one considers the fact that women and children belong to a vulnerable group that consumes about three-quarters of the health services of a country. Nigeria, with a population of 140 millions (NPC, 2006), 20% of Africa's total, has a weak health system as it ranks 155th among 177 countries surveyed for health status (FMOH/USAID/ENHANCE, 2006). This weak national health system contributed immensely to making the country to have one of the highest maternal mortality ratios of 1,100 per 100,000 live births. The situation is such that a woman's life-time risk of maternal death in Nigeria is 1 in 14 which though comparable to the 1 in 22 in sub-Saharan Africa, but sharply contradicts the 1 in 8,000 reported for the industrialized countries (UNICEF, 2007). This expectedly, is not without serious negative implications for child survival as (FMOH/USAID/ENHANCE (2006) reports that 1 in every 10 babies born in Nigeria dies before his first birthday. These alarming health indices have been attributed essentially to inadequacies in the availability and quality of maternal and child health services (Rasch, 2007), particularly emergency obstetric and neonatal care (FMOH, 2002).

At the PHC level which is said to handle majority of community health issues (Gofin and Gofin, 2005), statistics show that there are a total of 5,482 PHC facilities, mal-distributed among the various geo-political wards constituting the country's 774 LGAs. Only forty-nine (49) percent of these 5,482 PHC facilities offer ante-natal services while 42% offer delivery and post-natal services. Majority (76.7%) of these facilities operate with under-trained health personnel as there were only 7,514 midwives and 528 medical-officers-of-health who are mostly concentrated at the LGA headquarters. The midwives are found mostly in the easy-to-reach communities.

leaving out the remote, sometimes hard-to-reach settlements where most casualties happen un-reported. Only about 50% of the PHC facilities run 24-hours' service (UNFPA/FMOH, 2003). A recent federal government publication claims that just 64% of all births in the country received ante-natal care from a skilled attendant (FMOH, 2002), while only 36% of deliveries were assisted by skilled attendants (NDHS, 2003).

The situation is such that the approximately 7 million pregnant women in the country (i.e. 5% of 140 million), majority patronizing PHC and unorthodox facilities, are grossly under-served with skilled pregnancy care and delivery services. There is thus a significant deficit in both the availability and 24-hour accessibility of quality obstetric services needed to let the women live (Ijadunola et al, 2007). Coupled with this is the low level of reproductive health information at all tiers of care (FMOH, 2002). Whereas there are wide gaps in the level of knowledge, attitude and motivational support for reproductive health issues among the people (van Ergmond et al, 2004), same is also true among various categories of health workers and even among our policy makers.

In an environment where women have to contend with problems of low education, poor economic empowerment, cultural barriers like food taboos, gender bias and denials, coupled with health policies that are not only under-funded, but also vertically-implemented, the nation's maternal health status indices still face significant bottleneck to improvement.

2.3 ANTE-NATAL CARE

Ante-natal care (ANC) is the care that a woman receives throughout the course of her pregnancy. The primary aim of ANC is to achieve a healthy mother and a healthy baby (JHPIEGO, 2001). Government of the United Kingdom first formalized the idea of special care for pregnant women through the public health services in the late 1930s (Villar and Bergsjo, 1997). This was after realizing that while mortalities due to hemorrhage, puerperal sepsis and obstructed labour (all being complications of labour) declined substantially with improved skilled labour management, this was not the case with maternal deaths associated with eclampsia (WHO/UNICEF, 2003).

Pre-eclampsia / eclampsia is a life-threatening complication of pregnancy which in most cases could be averted through specific preventive measures put in place earlier in pregnancy to monitor/control blood pressure and urinary proteins. With adequate pre-natal care, it is also possible to identify those pregnant women at risk of eclamptic convulsions (Brown et al, 2000; Villar and Bergsjo, 1997), and therefore take necessary steps to pre-empt or manage it successfully (Rooney, 1992).

Aside from detecting and offering special care to high-risk cases, backed by efficient referral services, ANC is also delivered to sensitize and teach the pregnant woman elements of child-care like benefits of adequate breastfeeding and appropriate child-weaning practices as well as childhood-immunization against vaccine-preventable diseases. It is not uncommon finding a pregnant woman bringing along to the clinic, an under-5 year old child whose situational needs could as well be attended to while caring for the mother.

Ante-natal care similarly offers the health worker an opportunity to allay the fears and negative cultural taboos and misconceptions which a client could be having regarding her pregnancy and childbirth. The pregnant women and their families are educated about the various signs of pregnancy, as well as the *danger signs and symptoms* of pregnancy (Alam et al, 2005), and of complicated labour/delivery. That is, how to recognize them, what to do, and where to get help. This in effect, may sensitize them on the need and benefits of their being assisted at delivery by a skilled health care provider. Skilled birth attendants – i.e. doctors, nurses, midwives – are the providers of appropriate obstetric care for complications when backed by functional equipment and supplies.

Evidence abounds in literature, widely supporting a positive correlation between availability of skilled attendance in pregnancy, labour and delivery, and reduction in adverse pregnancy outcomes (Raatikainen et al, 2007). Unfortunately however, very few of Nigerian women aged 15-24 years who have given birth, were attended by a trained health professional pre-natally (49.6%) and at delivery (29.7%) (NDHS, 2003).

The ANC period offers a pregnant mother a wide range of health interventions that could promote her health and well-being, as well as that of her infant (Campbell and Graham, 2006; WHO/UNICEF, 2003). Specific health-protective measures like

Tetanus Toxoid immunization during pregnancy can be life-saving for both mother and infant (Alam et al, 2005), just as the prevention (through intermittent preventive therapy, IPT, and use of insecticide-treated bednets, ITNs) and treatment of Malaria-in-pregnancy would do. Pregnant women are particularly more susceptible to malaria due to their lessened immunity (Cot and Deloron, 2003). The parasitic infection is the most common indirect cause of maternal mortality (Cot and Deloron, 2003) while it also threatens about 24 million pregnancies annually (FMOH/MAC, 2004). In Nigeria, it is responsible for 11% of maternal deaths, for 15% of anemia-in-pregnancy, and for one out of every four cases of anemia in the general population (FMOH/MAC, 2004). Other adverse pregnancy outcomes like preventable low birth-weight (30% of which are due to Malaria) can be reduced appreciably through nutrient supplementation for the pregnant woman (WHO/UNICEF, 2003). Iron-deficiency can in itself cause severe anemia, which is associated with intra-uterine growth restriction (IUGR), preterm delivery, low birth-weight, as well as fetal and maternal deaths (JHPIEGO, 2001).

Of recent, ante-natal care has been focused as an entry point for the prevention of Human Immuno-deficiency Virus (HIV) and other sexually-transmitted infections like Syphilis (Carolli et al, 2001; Villar and Bergsjo, 1997). Women of child-bearing age are most vulnerable to HIV infection. The virulence is aptly demonstrated in all the southern African countries (except Angola) where the highest HIV prevalence of 17.4% - 39.4% was found among ANC attendees aged 15-24 years (UNAIDS/WHO, 2005). A similar situation exists in Nigeria where the 2003 national HIV sentinel survey of 27,708 ANC-attending pregnant women found the highest prevalence of 5.4 – 5.6 % among the 20-29 years age-group (FMOH, 2004). Once infected, a pregnant woman with or without symptoms, passes the HIV virus onto her child before, during or after delivery in 25-45% of cases (FMOH, 2002). Reports from JHPIEGO (2002) show that majority of mother-to-child transmissions take place during pregnancy (20%), child-birth (40%) and through breastfeeding (40%).

Attending ANC clinics offers the pregnant woman counselling on the use of condom to protect her from the disease, assists her to know her HIV-status through testing and also educates her on how to stay healthy if diagnosed positive. She is also exposed to essential obstetric services during childbirth, as well as breastfeeding

options that could significantly limit the chances of mother-to-child transmission of HIV virus.

Still derivable from functional ANC services is the receptiveness of the pregnant woman during this period to health education and counselling on appropriate use of drugs (including local, herbal preparations) during pregnancy. Over-the-counter prescriptions and inappropriate drug procurements are a common practice in Nigeria due to what Erhun et al (2001) described as poor implementation of an otherwise adequate drug control laws.

At minimal costs and under culturally-acceptable conditions, ANC period presents a good avenue to promote the practice of birth-spacing through counselling and modern family planning contraceptives (Mboye, 2003). Pregnancies tend to be most risky for women who are either too young (less than 18 years), too old (above 40 years) (Ibrahim et al, 2008), or having a pre-existing or co-existing systemic medical / obstetric problems. This situation is also true for women who are either un-married or in a lower socio-economic group (Briery and Morrison, 2008), women having more than four previous births (Ibrahim et al, 2008), as well as women not desiring another pregnancy. An unwanted pregnancy almost invariably ends up as either induced abortion (Okonofua et al, 1999), or abandoned baby. In Nigeria, as in most parts of Africa and other developing countries, abortion is illegal or very restricted (Thonneau et al, 2002), making most women with problem of un-intended pregnancy to resort to self-help through induced abortion usually by un-trained hands under medically-unsafe environments (Okonofua et al, 2005; Okonofua et al, 1999). For various reasons (including religious, socio-cultural, political, etc.), data on abortions are greatly censored, hence the estimated 610,000 abortions reported by Henshaw et al (1998) as being performed in the country yearly could only be a tip of an iceberg. Often, dangerous sequelae of complications follow this practice such as death, hemorrhage from traumatic uterine perforations, fistulae, post-abortal sepsis leading to chronic pelvic inflammatory diseases (PID) and secondary infertility (Grimes et al, 2006). Unsafe abortion worldwide is responsible for about 10% of maternal deaths (Ahman and Shah, 2004), as well as cases of infertility among 2% of women-of-reproductive age (WHO, 2004).

Aggregate findings from various studies world-wide have shown that about 15 per cent of all pregnancies will develop a life-threatening complication, most of which cannot be predicted (UNICEF/WHO/UNFPA, 1997). With this fact, it thus becomes expedient for every pregnant woman to have a birth and complication–readiness plan put in place. Such a plan, unique for each client, is a mutual agreement between the client, her spouse or family, and the attending health-care provider. It is essentially about the pregnant woman's preferred or appropriate place of birth (that could offer her skilled care in case of emergencies), as well as the available means of accessing such service (JHPIEGO, 2001).

"Access" as described by WHO/UNICEF (2003), considers the physical availability of services, quality of the services; distance and the available means of transportation to reach this facility; man-hours lost, as well as availability of funds to procure logistic needs during labour. In many traditional societies where high premium is placed on several cultural taboos which may themselves impede access to health care, there is also the need to decide ab-initio, who the decision-maker will be, particularly in emergencies, and in the immediate post-partum period (WHO/UNICEF, 2003).

2.4 ANTE-NATAL VISITS

According to WHO model of ante-natal care, pregnant women can be classified into two broad groups depending on needs. First group are the majority (75%) of the total population of pregnant women who need only routine ANC, while the second group comprise the rest 25% who have some specific health conditions or risk factors necessitating special care. For the first group, a standard regimen of four ANC visits has been recommended by the global health body (Villar and Bergsjo, 2002; W.H.O. 2003), with additional visits should conditions emerge ,which require special care. Ideally, ante-natal care should begin shortly after conception, and continue throughout pregnancy. This is however not the case in most parts of the sub-Saharan Africa where no less than 60-70% of pregnant women report for ANC only after the fourth month (Okafor and Rizzuto, 1994; AbouZahr and Wardlaw, 2002; van Eijk et al, 2006).

Across different regions of the world, frequency of ANC visits is highly variable. Findings from global 1990-2001 demographic surveys show at least 98% of

pregnant women in industrialized nations having made at least one ANC visit as opposed to about 68% in sub-Saharan Africa. In Nigeria, the coverage is about 60% (NDHS, 2003).

Over the years, facility-based records from PHC centres nation-wide show more women (about 72%) reporting 4 or more ANC visits, sometimes up to 8, 9 or 10 before they deliver (AbouZahr and Wardlaw, 2002). This is one finding clearly at variance with the world-acclaimed figures of 1,100 maternal deaths per 100,000 live births (WHO/WHS, 2008) now being quoted for Nigeria. This paradoxical situation suggests that for too long, extensive ANC services have taken the centre-stage, to the detriment of providing accessible and affordable essential obstetric care during the relatively-short but most-risky period of child-birth. Another plausible explanation is that the pregnant women in this part of the world are far less likely to be cared for by a skilled attendant during those numerous visits to the ANC clinic. Skilled attendants (exclusively defined by WHO in 1999 as professionals like midwives, doctors and nurses, all having midwifery skills), are seldom available 24 hours in most PHC facilities. At this level of health care, less than 50% of the facilities nationally have at least a midwife (UNFPA/FMOH, 2003), as community health extension workers (CHEWs) remain the most commonly available health cadre on ground (UNFPA/FMOH, 2003).

2.5 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF WOMEN USING ANTE-NATAL CARE SERVICES

World-wide, majority of the "women-killers" are complications arising during or around the time of childbirth. It is said that over half of these deaths could be averted through the provision of essential obstetric care (EOC) during labour and delivery (Rasch, 2007; UNFPA, 2003). Aside from sensitizing the pregnant woman to seek skilled birth attendance at delivery, antenatal care has been found capable of averting 26% of maternal deaths (Jowett, 2000), even as Sule–Odu (2000) observed more maternal deaths among booked compared to un-booked cases. Despite these beneficial effects of ANC, orthodox maternal health services' utilization (wether before, during or after delivery) is relatively low for any meaningful impact on maternal mortality. Certain factors could possibly have been responsible for the

apparent inaccessibility of the pregnant woman in this environment to essential obstetric care.

One of the attributable factors is the *spatial distribution and geographical location of the orthodox health facilities.* At the primary health care level which handles nearly 80% of health issues in the population, women often travel long distances and wait long hours for ante-natal care (Stekelenburg et al, 2004). This is largely due to the physical remoteness and inaccessibility of most PHC centres to the people, particularly in the rural areas. Substantial economic and opportunity costs are involved as most women in these suburbs are peasants depending on subsistence farming and/or petty-trading for their living. This situation perhaps explains why as reported by WHO in 2003, only about 50% of rural women in developing countries could garner at least 4 ante-natal visits before they deliver.

Cost of health services:- Cost of health services and transportation to access the service is also a limiting factor to ANC utilization in this part of the world (Sundari, 1992). Attah (1986) for instance, reported that attendance at government maternity clinics in eastern Nigeria began to drop in 1985 when the clinics started asking for deposits for ante-natal care.

Women's educational status:- Findings from the 1990-2001 global Demographic and Health Surveys, as well as Nigerian studies (Ejembi et al, 2004; Ebuehi et al, 2006) show that educated women in developing countries are more likely than non-educated to receive ante-natal care. Their likelihood of using ANC services is even dependent on their level of education (WHO, 2003).

Family wealth:- Maternal health services' utilization is said to be worse among poorer families than among the relatively rich families (Uguru et al, 2006). Such women from rich families may even be healthier and have healthier babies. Generally-speaking, it is those poor and under-educated women who should have benefited most from pre-natal care, that get it least.

Age group:- Existing research has not documented any pronounced differences in ANC utilization among the different age-groups in the reproductive age. However, older women (aged 35 or more years) report slightly higher levels (WHO, 2003).

Parity:- Generally-speaking, women expecting their first child are the most likely to utilize ANC services. This was corroborated by Low et al (2005), whose study found a significant association between high parity and late initiation of antenatal care. A similar finding is that of Lumbiganon et al (2008) which reported an association between high parity and failure to receive antenatal care. The situation may however not always be the case in some traditional African societies where other factors like recent change of husband, or positive history of fetal / infantile deaths, may engender higher ANC usage even among high-parity women.

Time of ANC Booking:- Presenting for antenatal care early in pregnancy (i.e. first trimester) will provide a time-interval long enough to enable women benefit more from those interventions that will not only promote their health, but also foresee and manage complications appropriately (Ekwempu,1990; Scholl et al,1994). This is the situation in most regions of the world, except sub-Saharan Africa where most women present rather late (Brian-D Adinma et al, 2002).

Nigerian 1999 DHS findings show majority (50%) of pregnant women booking for ANC at 4 to 5 months gestational age (i.e during second trimester) as against only 24% doing so in the first trimester (WHO, 2003).This was corroborated by Brian-D Adinma et al (2002) whose study found 53.8% booking in the second trimester, 36.5% in third trimester and only 9.7% in the first trimester. Adekunle (2002) found 67.3% of pregnant women delaying their ANC booking till second trimester, a proportion even higher than either of the two earlier studies.

Privacy and self-respect:- Most public pre-natal clinics do not offer privacy when clerking or examining women (Adekunle, 2002). Clients sometimes shun ANC clinics believing that they would undergo vaginal examinations at each and every visit. Kyomuhendo (2003) cited abuse of patients, neglect and poor treatment in the hospital as some of the reasons given by mothers for preferring home-based pregnancy care to facility-based one. All these are perceived by many women (especially in rural communities) as an infringement on their privacy and self-respect.

*Clinic environment:-*The usual once-a-week (or fortnightly) clinic schedule of attending to the needs of pregnant women often make ANC clinic sessions rather crowdy. So many activities are lumped together on this day, allowing little time for

the health worker to interact personally with the client, particularly on issues bothering on confidentiality.

Religious beliefs and practice:- As in Sharia-practicing states of northern Nigeria and among some devout Muslims in the south, some women prefer being cared for by female health workers only (Adamu and Salihu, 2002; Iliyasu et al, 2004). They therefore exhibit little or no interest in attending clinics manned exclusively by male healthcare professionals.

Negative perceptions:- Since pregnancy and child-birth are natural physiological events, it is difficult to convince certain people that pre-natal care is of paramount importance to maternal health. In some traditional societies, pregnancy is viewed as a test of tolerance, and maternal deaths as a sad but "normal" event (Kyomuhendo, 2003). Men and women in such environments therefore see maternity hospitals and clinics as "problem-places", deserving patronage only when they have obvious complications, or as the last resort.

Traditional beliefs and preferences:- Experiences have shown that women used to traditional lifestyles and those who once had a non-complicated home delivery are not likely to utilize facility-based pre-natal services. Some other women, even if they had received ANC services at a health facility, will still prefer to deliver at home in a familiar environment, often with the assistance of someone known to them (Griffiths and Stephenson, 2001). In some cultures, married women need permission from their husbands, mothers-in-law or other relations to leave home to access healthcare services (van Ergmond et al, 2004; Okafor and Rizzuto, 1994). Notwithstanding the recent improvements in social and community mobilization efforts aimed at boosting health services-utilization at PHC level, a sizeable number of pregnant women still seek care from traditional birth attendants (TBAs) and spiritual homes (Adekunle, 2002). Reasons for this preference include the fact that TBAs are widely available in the community, more culturally-acceptable and friendly (Kyomuhendo, 2003), and also operate a rather more flexible schedule and mode of payment for services rendered (UNFPA/FMOH, 2003).

CHAPTER THREE

STUDY MATERIALS AND METHODOLOGY

3.1 DESCRIPTION OF STUDY AREA

Odeda Local Government Area is one of the 20 Local Government Areas that make up Ogun State. It is essentially, a rural Local Government Area bounded by Abeokuta South and Obafemi-Owode Local Government Areas in the South, Oyo State in the North and East, and by Abeokuta North Local Government Area in the West. Occupying a landmass of approximately 1,263 square kilometres, the LGA has its headquarters in Odeda town situated about 20 kilometres from Abeokuta, along Abeokuta - Ibadan highway.

By 2006 Census, there are approximately 219,000 inhabitants, 90% of whom are Yorubas of Egba ethnic stock. The non-Yoruba segment of the population include Fulanis, Hausas, the Igedes (from Benue State), and very few Igbos. There are about 25 semi-urban settlements and 860 hamlets, all divided into three geographical zones of Odeda, Ilugun and Opeji. For ease of administration are 10 geo-political wards, namely, Odeda, Itesi, Olodo, Alagbagba, Ilugun, Osiele, Alabata, Obantoko, Obete and Opeji wards (O.L.G, 2006), The people are predominantly subsistence farmers, a vocation they practice alongside petty-trading. A few inhabitants are engaged in livestock and cattle-rearing, while others are artisans and housewives. Common religious beliefs among the people include Christianity, Islam, and traditional worship.

In terms of health care delivery, the LGA is served by a General Hospital located at the headquarters, and 23 local government-owned primary health care facilities spread across the 10 geo-political wards. These PHC facilities are being run by 33 qualified nurse-midwives and 21 community health extension workers (CHEWs), all being supervised by a Medical Officer-of-Health, also designated as the PHC Coordinator. There are 10 registered private clinics/maternity homes operated by nurses, as well as several medicine shops / treatment homes being run by traditional birth attendants and other untrained care-givers.

3.2 STUDY POPUL. ATION

This comprise pregnant women who have booked and attended ante-natal care (ANC) clinic sessions in two of the LG-owned primary health care (PHC) facilities, namely, Orile-Ilugun and Obantoko Health Clinics. Geographically, these two health facilities are respectively located in the northern and southern extremes of the LGA.

3.3 STUDY DESIGN

This is a retrospective cross-sectional study designed to examine the various factors (social, demographic and obstetric) associated with pregnancy-outcome among antenatal care (ANC) clinic attendees in Odeda Local Government Area of Ogun State. Towards this end, secondary data were gathered from the ANC clinic booking cards as well as labour and delivery registers of booked pregnant women who also delivered in the two selected PHC facilities between July 2004 and June 2007.

3.4 SAMPLING STRATEGY

A total sample of ANC-attending pregnant women aged 15-49 years was considered. Of the 501 registered, only 416 cases were found eligible for the study. The remaining 85 women were dropped due to gross incompleteness of their clinic records. Of the 416 eligible women, 195 were from Obantoko Health Clinic, while 221 were from Orile-Ilugun Health Clinic.

3.5 INSTRUMENT DESIGN AND DATA-COLLECTION PROCEDURE

The instrument of data collection was a structured check-list prepared and divided into 3 sections, namely:

Section A: Socio-demographic variables.

Section B: Obstetric history and outcome of index pregnancy.

Section C: History of the immediate past pregnancy.

This is the proforma used to extract information from each client's ANC booking card as well as the health facility's labour/delivery register.

3.6 VALIDITY AND RELIABILITY

The checklist was pre-tested on 12 ANC cards picked randomly from Obada health clinic, located in an equally-rural Ewekoro Local Government Area of Ogun State. The essence of this is to identify possible flaws in the applicability of the proforma to the entire study. Such areas of the checklist found to be prone to mis-interpretation were then re-worded to ensure consistency and non-ambiguity.

3.7 SCOPE AND LIMITATION OF THE STUDY

This retrospective, country-based cross-sectional study is representative of the pregnant women in Odeda LGA. The study had examined all the commonly-practiced aspects of pregnancy care as applicable to PHC elsewhere. However, the scope of the study was limited by a number of factors which include:-

(1) Improper filling of many of the antenatal booking cards which could otherwise have been useful for the study. Consequently, only 416 of the total 501 ANC booking cards gathered from the two PHC facilities surveyed had the complete information needed to actualize the stated study objectives.

(2) Subjective classification of some of the items of scrutiny on the ANC cards and delivery registers, for example, patient's gestational age at booking. This is expected since health workers at the PHC level hardly makes use of objective, sensitive diagnostic equipment (like Ultrasound scan or weighing scales) in the course of their practice. And where such facility is available, the health worker's skill for correct interpretation of results obtained from usage may not be there.

(3) Problem of recall-lapse. This is a common hindrance to accurate data gathering in many of the traditional societies (including the study area). People tend to have difficulties recalling important dates (like last menstrual period) or events (like number of previous pregnancies or births) (Som, 1959). Unfortunately, the health care provider at this level had relied on information supplied by the subject without means of verification – whether right or wrong.

(4) Cultural barriers which forbade revealing certain personal family information like a woman's number of previous births, or the number of her surviving children.

3.8 ETHICAL CONSIDERATIONS

Consent of the Executive Chairman, Odeda Local Government, was sought for and obtained before embarking on the study. Similarly, heads of the two selected PHC facilities who are Senior Matrons were briefed and their informed consent obtained in order to gain access to the various clinic records used during the study.

3.9 DATA ANALYSIS

Data from the clinic records of the 416 eligible cases were copied out onto pre-numbered data-collection forms and later entered into the computer for electronic processing. The analysis was done using SPSS software. Frequency tables were generated for relevant variables. The chi-square test was used to investigate associations between categorical variables. All analyses were done at the 5% level of significance.

CHAPTER FOUR

RESULTS

SOCIO-ECONOMIC CHARACTERISTICS OF THE PREGNANT WOMEN

Table 1 below shows that majority 69.5% of the pregnant women were in the 20-29 years age-group, followed by the 21.6% in the age-group 30-39 years. Some 6.7% were teenagers, while the least 2.2% were women aged 40 years or more. Mean age of the respondents was 25.5 ± 5.3 years.

On religious affiliation, a higher proportion (68.3%) of the pregnant women were Christians, while 31.7% of them were Muslims. As at the time of booking, a total 93.5% of these women were either legally-married or co-habiting with a man, while a minority 6.5% were still single and never married.

On educational attainment, a little above one-third (38.0%) of the women had secondary education, 32.2% had primary education, while 26.7% had no formal education. Only 3.1% had post-secondary education.

With regards to individual means of livelihood, a large majority (98.1%) of the women are petty-traders, farmers, or housewives leaving only 1.9% who are civil servants.

Table 1:- Socio-Economic Characteristics Of The Pregnant Women

	PREGNANT WOMEN	
	No	**%**
Age-distribution (yrs):		
Less than 20	28	6.7
20 – 29	289	69.5
30 – 39	90	21.6
40 and above	9	2.2
Total	416	100.0%
Mean = 25.5 ; Standard deviation = 5.3		
Distribution of the pregnant women by Religion:		
Christianity	284	68.3
Islam	132	31.7
Total	**416**	**100.0%**
Marital status of the pregnant women at booking:		
Single/Never married	27	6.5
Married/Co-habiting with a man	389	93.5
Total	**416**	**100.0%**
Educational status of the women:		
No formal education	111	26.7
Primary	134	32.2
Secondary	158	38.0
Post-secondary	13	3.1
Total	**416**	**100.0%**
Occupational status of the women:		
Middle (civil servants)	8	1.9
Low (petty-trading, farming, housewives, etc)	408	98.1
Total	416	100.0%

PREGNANCY HISTORY OF THE WOMEN

The table below shows that more than one-third (36.3%) of the clients had been pregnant at least 4 times; 24.3% twice; 23.8% once, and 15.6% thrice. Mean number of previous pregnancies was 3.0 ± 1.8.

Pregnant women with a single previous birth constituted 26.7% of the study population. This is followed by those 23.8% who had not delivered before, 22.1% who had 3 previous births, 13.9% having two previous births, and 13.5% who had 4 or more previous births. Mean birth order found was 1.9 ± 1.7.

On number of surviving children, 27.2% of the women had only one, 25.7% had none, 21.9% had three, 17.8% had two, while 7.5% had at least 4 living children. Mean number of surviving children found was 1.6 ± 1.4.

Positive familial history of twin-births was elicited in 37.0% of the women.

Table 2:- Pregnancy History Of The Women

	PREGNANT WOMEN	
	No.	**%**
Gravida status:		
1	99	23.8
2	101	24.3
3	65	15.6
4 or more	151	36.3
Total	**416**	**100.0%**
Mean = 3.0 ; Standard deviation = 1.8		
Parity:		
0	99	23.8
1	111	26.7
2	58	13.9
3	92	22.1
4 or more	56	13.5
Total	**416**	**100.0%**
Mean = 1.9 ; Standard deviation = 1.7		
Number of surviving children:		
0	107	25.7
1	113	27.2
2	74	17.8
3	91	21.9
4 or more	31	7.5
Total	**416**	**100.0%**
Mean = 1.6 ; Standard deviation = 1.4		
History of twinning in the Family:		
Positive	154	37.0
Negative	262	63.0
Total	**416**	**100.0%**

UTILIZATION OF ANC SERVICES BY THE PREGNANT WOMEN

Majority (39.5%) of the pregnant women attended ANC clinics 4 or more times, 24.0% only once, 19.0% twice, and the remaining 17.5% thrice. Mean number of ANC clinic attendance was 3.5 ± 2.4 times.

Booking for ante-natal care at 16-28 weeks of pregnancy was more common (65.9%) among these women than booking after 28 weeks (34.1%). Mean gestational age at booking was 27.1 ± 9.0 weeks.

Some 45.4% of the women had made use of ultrasound scan services compared to the 54.6% who did not.

Tetanus toxoid vaccination was received by 61.5% of the pregnant women who took two doses of the vaccine, 23.3% who took only one dose and 13.7% who never took any dose. There was no record of vaccination in the remaining 1.4% of the women.

Table 3:- Utilization Of ANC Services By The Pregnant Women

	PREGNANT WOMEN			
	No.	**%**	**Mean**	**Std. dev.**
Total number of ANC clinics attended:-				
1 visit	100	24.0		
2 visits	79	19.0		
3 visits	73	17.5		
4 or more	164	39.5		
Total	**416**	**100.0%**	**3.5**	**2.4**
Gestational age at booking (wks):-				
16 – 28	274	65.9		
More than 28	142	34.1		
Total	**416**	**100.0%**	**27.1**	**9.0**
Use of Ultrasound Scan facility :-				
Yes	189	45.4		
No	227	54.6		
Total	**416**	**100.0%**		
Number of T.Toxoid doses received:-				
None	57	13.7		
1 dose	97	23.3		
2 doses	256	61.5		
Not indicated	6	1.4		
Total	**416**	**100.0%**	**1.5**	**0.7**

LABOUR HISTORY OF THE PREGNANT WOMEN

Majority (91.6%) of the 416 eligible respondents attained term pregnancy before going into labour while 6.2% had pre-term labour. The remaining 2.2% women had no available labour records. Mean gestational age at labour was 38.2 ± 3.4 weeks. Labour was augmented in 7.4% of the pregnant women.

Most (76.4%) of the women had cephalic/vertex fetal presentation at labour, 3.1% had breech presentation, while 1.0% had oblique-lying fetuses. There was no record of fetal presentation in 19.5% of the women.

Table 4:- Labour History Of The Pregnant Women

	PREGNANT WOMEN	
	No.	**%**
Gestational age at onset of Labour:		
Term (i.e ≥37 completed wks)	381	91.6
Preterm (i.e < 37 completed wks)	26	6.2
Not indicated	9	2.2
Total	**416**	**100.0%**
Mean = 38.2 ; Standard deviation = 3.4		
Labour augmented:		
Yes	31	7.4
No	376	90.4
Not indicated	9	2.2
Total	**416**	**100.0%**
Fetal presentation at Labour :		
Cephalic/Vertex	318	76.4
Breech	13	3.1
Oblique lie	4	1.0
Not indicated	81	19.5
Total	**416**	**100.0%**

DELIVERY HISTORY OF THE PREGNANT WOMEN

Male babies were commoner (59.1%) among the pregnant women, as against the 38.7% of them who had female babies. A total 56.4% of the women delivered babies weighing 2.5 – 3.0 kilograms, while 36.1% had babies weighing more than 3.0 kilograms. Low birth-weight (i.e. birth-weight less than 2.5 kilograms) was recorded among 3.4% of the women, while another 4.1% had no records of their babies' weight at birth. Mean birth-weight of the newborns was 3.0 $\pm$ 0.4 kilograms.

Oxytocics (including ergometrine and oxytocin) injections were administered on 94.2% of the pregnant women at delivery. About 2.7% of them did not have this chemotherapy, while 3.1% had no records of either ergometrine or oxytocin being used on them.

Only 1.0% of the newborn babies had prophylactic vitamin k injection at birth, while majority (95.9%) of them did not have it. There was no documentation of vitamin k therapy in 3.1% of the newborns.

Following delivery, fifty-seven percent of the women had stayed two days in hospital, 24.0% stayed one day, 13.2% three days, and 1.7% more than three days. Referral of either mother or child (or both of them) during labour or after delivery was carried out in 1.5% of the cases, while 95.4% of the cases were not referred. The remaining 3.1% of the mothers had no records as to whether or not they were referred at all.

On the status of the care-giver attending the births, available records showed that majority (60.8%) of the births among the study population were attended by nurse-midwives. Another 27.4% were attended by community health extension workers (CHEWs), and 7.0% by ward-maids / health attendants. The type of birth-attendant was not indicated in the remaining 4.8% of the women.

Table 5:- Delivery History Of The Pregnant Women

	PREGNANT WOMEN	
	No.	%
Baby's Sex :		
Male	246	59.1
Female	161	38.7
Not indicated	9	2.2
Total	**416**	**100.0%**
Birth-weight of the Baby (kgs) :		
Less than 2.5	14	3.4
2.5 – 3.0	235	56.4
Above 3.0	150	36.1
Not indicated	17	4.1
Total	**416**	**100.0%**
Mean = 3.00 ; Standard deviation = 0.40		
Use of Oxytocics during delivery :		
Yes	392	94.2
No	11	2.7
Not indicated	13	3.1
Total	**416**	**100.0%**
Use of Vitamin K during delivery :		
Yes	4	1.0
No	399	95.9
Not indicated	13	3.1
Total	**416**	**100.0%**
Duration of post-delivery confinement :		
1 day	100	24.0
2 days	237	57.0
3 days	55	13.2
More than 3 days.	7	1.7
Not indicated.	17	4.1
Total	**416**	**100.0%**
If mother/child referred after delivery:-		
Yes	6	1.5
No	397	95.4
Not indicated	13	3.1
Total	**416**	**100.0%**
Status of Birth Attendant :-		
Nurse/Midwife	253	60.8
CHEW	114	27.4
Health Attendant	29	7.0
Not indicated	20	4.8
Total	**416**	**100.0%**

HISTORY OF THE IMMEDIATE PAST PREGNANCY

A total of 28.4% of the pregnant women had live births from their immediate past pregnancy, and the babies survived. Another 1.4% had abortion/miscarriages while 1.2% had live births even though their babies died shortly after. There was no documented information on the outcome of last pregnancy in 287 (69.0%) of the mothers.

On place of last delivery, 12.2% of the mothers were delivered in a local government health centre, 11.1% in private clinic/hospital, 6.5% delivered at home, 0.7% in a General Hospital and 0.5% in spiritual/traditional birth attendants' homes. Information on referral services was available in 121 (or 29.1%) of the 416 clients studied, and none of these 121 women was reported to have been referred either during or shortly after their last delivery.

Table 6:- History Of The Immediate Past Pregnancy

	No.	%
Outcome of the immediate past pregnancy ;		
Aborted/miscarried	6	1.4
Delivered and alive	118	28.4
Delivered live, but died shortly after.	5	1.2
Not indicated.	287	69.0
Total	**416**	**100.0%**
Place of last confinement :		
Local Govt. Health Centre	51	12.2
General Hospital	3	0.7
Private Clinic/Hospital	46	11.1
TBA/Spiritual Home	2	0.5
At home	27	6.5
Not indicated.	287	69.0
Total	**416**	**100.0%**
If mother or child was referred:		
Yes	Nil	Nil
No	121	29.1
Not indicated.	295	70.9
Total	**416**	**100.0%**

Effect of Socio - demographic Factors on Pregnancy Outcome.

MATERNAL AGE:-

EFFECT ON BIRTH-WEIGHT OF THE BABY

A higher proportion (12.0%) of the teenage pregnant women delivered low birth-weight babies compared to the lower 2.9% proportion of low birth-weights among the older mothers (p = 0.003).

Table 7:- Birth-weight Of The Baby By Maternal Age

	Birth-weight of the baby (kgs)			Total
Maternal Age (yrs):	**<2.5**	**2.5-3.0**	**>3.0**	
<20	3 (12.0)	19 (76.0)	3 (12.0)	**25 (100.0)**
20 and above	11 (2.9)	216 (57.8)	95 (39.3)	**278 (100.0)**
Total	**14** *(3.5)*	**235** *(58.9)*	**150** *(37.6)*	399 *(100.0)*

$X^2 = 11.5$ df = 2 p = 0.003

MARITAL STATUS AT ANC BOOKING:-
EFFECT ON BIRTH-WEIGHT OF THE BABY

There is a highly statistically-significant association between the pregnant women's marital status and birth-weight as a higher proportion (22.2%) of the single/never married women gave birth to low birth-weight babies compared to only 2.2% among married women ($p = 0.000$).

Table 8:- Birth-weight Of The Baby By Marital Status

	Birth-weight Of The Baby (kgs)			Total
	<2.5	2.5-3.0	>3.0	
Marital Status:				
Single/Never married	6 (22.2)	18 (66.7)	3 (11.1)	**27 (100.0)**
Married/Living together with a man	8 (2.2)	217 (58.3)	147 (39.5)	**372 (100.0)**
Total	**14 (3.5)**	**235 (58.4)**	**150 (37.6)**	**399 (100.0)**

$X^2 = 34.6$ df = 2 p = 0.000

Relationship between obstetric variables and pregnancy-outcome.

GRAVIDA STATUS:-

EFFECT ON BIRTH-WEIGHT OF THE BABY

Majority (64.3%) of the low-birth weight babies were delivered by women who had been pregnant three or more times. The remaining 35.7% of the low birth-weights were shared among women pregnant for the first time (28.6 %), and women carrying their second pregnancy (7.1%). A significant relationship exists between a mother's gravida status and the delivery of a low birth-weight baby (p = 0.003).

Table 9:- Birth-weight Of The Baby By Mother's Gravida Status

	Birth-weight of the baby (kgs)			
	<2.5	2.5 – 3.0	>3.0	Total
Gravida Status:				
1	4 (28.6)	66 (28.1)	26 (17.3)	**96 (24.1)**
2	1 (7.1)	65 (27.7)	29 (19.3)	**95 (23.8)**
3 or more	9 (64.3)	104 (44.3)	95 (63.3)	**208 52.1)**
Total	**14 (100.0)**	**235 (100.0)**	**150 (100.0)**	399 (100.0)

$X^2 = 15.7$ df = 4 p = 0.003

PARITY :-

EFFECT ON BIRTH-WEIGHT OF THE BABY

Pregnant women with two previous births recorded the highest 50.0% of low birth-weight babies, followed by 28.6% among women who had no previous birth experience. Women with three (3) or more previous births had 14.3%, while those with just one (1) previous birth had the least 7.1% of the low birth-weight babies. A mother's parity has a significant influence on birth-weight of baby delivered (p = 0.000).

Table 10:- Birth-weight Of The Baby By Mother's Parity

	Birth-weight of the baby (kgs)			
	<2.5	2.5 – 3.0	>3.0	Total
Parity :				
0	4 (28.6)	66 (28.1)	26 (17.3)	**96 (24.1)**
1	1 (7.1)	67 (28.5)	34 (22.7)	**102 (25.6)**
2	7 (50.0)	31 (13.2)	18 (12.0)	**56 (14.0)**
3 and above	2 (14.3)	71 (30.2)	72 (48.0)	**145 (36.3)**
Total	**14 (100.0)**	**235 (100.0)**	**150 (100.0)**	**399 (100.0)**

$X^2 = 31.1$ df = 6 p = 0.000

NUMBER OF SURVIVING CHILDREN:-

EFFECT ON BIRTH-WEIGHT OF THE BABY

Fifty per cent of low birth-weight babies were delivered by women having 2 surviving children, 35.7% by those having not more than one surviving child, and 14.3% by women having at least 3 surviving children. A highly-significant association exists between these two variables ($p = 0.000$).

Table 11:- Birth-weight Of The Baby By Number Of Surviving Children

	Birth-weight of the baby (kgs)			Total
	<2.5	2.5 – 3.0	>3.0	
Number of surviving children: 0 – 1	5 (35.7)	142 (60.4)	61 (40.7)	**208 (52.1)**
2	7 (50.0)	30 (12.8)	35 (23.3)	**72 (18.0)**
3 or more.	2 (14.3)	63 (26.8)	54 (36.0)	**119 (29.8)**
Total	**14 (100.0)**	**235 (100.0)**	**150 (100.0)**	399 (100.0)

$X^2 = 25.3$ df = 4 p = 0.000

NUMBER OF ANC CLINICS ATTENDED:-

EFFECT ON BIRTH-WEIGHT OF THE BABY

Majority (64.3%) of the low birth-weights occur among women who had attended ante-natal clinic but once. Next is the 28.6% that occurred among two-time ANC clinic attendees, while the least 7.1% of low birth-weights was found among those women that observed three (3) or more ANC clinic visits before delivery. Birth-weight is significantly influenced by the number of times a pregnant woman attended ante-natal clinics ($p = 0.001$).

Table 12:- Birth-weight Of The Baby By Number Of ANC Clinics Attended

	Birth-weight of the baby (kgs)			Total
	< 2.5	2.5 – 3.0	> 3.0	
Total no. of ANC clinics attended: 1	9 (64.3)	62 (26.4)	29 (19.3)	**100 (25.1)**
2	4 (28.6)	49 (20.9)	26 (17.3)	**79 (19.8)**
3 or more	1 (7.1)	124 (52.8)	95 (63.3)	**220(55.1)**
Total	**14 (100.0)**	**235 (100.0)**	**150 (100.0)**	399 (100.0)

$X^2 = 19.8$ df = 4 p = 0.001

GESTATIONAL AGE AT BOOKING:-

EFFECT ON BIRTH-WEIGHT OF THE BABY

There is a positive association between age of pregnancy as at the time of booking for ante-natal care (ANC), and occurrence of low birth-weight deliveries (p = 0.001). Majority (78.6%) of the low birth-weight babies were born to mothers registering for ANC after 27 completed weeks of the pregnancy, while those registering earlier (i.e. before 27 completed weeks) had the remaining 21.4%.

Table 13:- Birth-weight Of The Baby By Gestational Age At Booking

	Birth-weight of the baby (kgs)			Total
	< 2.5	2.5 – 3.0	> 3.0	
Gestational age at booking (wks): 16 – 28	3 (21.4)	163 (69.4)	92 (61.3)	258 (64.7)
Above 28	11 (78.6)	72 (30.6)	58 (38.7)	141 (35.3)
Total	14 (100.0)	235 (100.0)	150 (100.0)	399 (100.0)

$X^2 = 14.5$ df = 2 p = 0.001

GESTATIONAL AGE AT ONSET OF LABOUR:-
EFFECT ON BIRTH-WEIGHT OF THE BABY

A higher proportion (26.1%) of babies delivered pre-term were of low birth-weights compared to a mere 2.1% of the term babies. The relationship between gestational age at onset of labour and the baby's birth-weight is highly significant (p = 0.000).

Table 14:- Birth-weight Of The Baby By Gestational Age At Onset Of Labour

	Birth-weight of the baby (kgs)			Total
	< 2.5	2.5 – 3.0	> 3.0	
Gestational age at onset of Labour:				
Term (i.e 37 or more completed wks)	8 (2.1)	222 (59.5)	143 (38.3)	**373 (100.0)**
Pre – Term (i.e less than 37 completed wks)	6 (26.1)	13 (56.5)	4 (17.4)	**23 (100.0)**
Total	**14 (3.5)**	**235 (59.3)**	**147 (37.1)**	**396 (100.0)**

$X^2 = 37.7$ df = 2 p = 0.000

MULTIVARIATE ANALYSIS:

Predictors of Low birth-weight babies in Odeda Local Government Area:-

Regression tests were carried out to test the hypothesis that the occurrence of low birth-weight babies (as an adverse pregnancy-outcome) depended on more than one variable, some being confounders. Several variables were then subjected to analysis to test the significance of their possible association with low birth-weight occurrence.

A risk-ratio greater than one for a particular variable indicates that pregnant women in that category are more likely to deliver low birth-weight babies compared to other pregnant women in the reference category. On the other hand, study subjects having risk-ratio less than one are less likely to deliver low birth-weight babies than other subjects in the reference category. A risk-ratio of one or close to one indicates no difference in the likelihood of having a low birth-weight newborn (Kleinbaum, 1979). Other variables (namely maternal age-group, marital status at booking, number of ANC clinics attended, gestational age at booking, and gestational age at onset of labour) were now fed in as independent variables, taking level of significance of association as $p < 0.05$.

Analysis of results show that teenage pregnant women are 48.6 times more likely to deliver LBW babies compared to other pregnant women aged above 20 years. The relationship is also significant ($p < 0.005$). Also, being a single and never married pregnant woman makes it highly (70.4 times) likely to deliver a LBW baby compared with married women, and the association is again statistically-significant ($p<0.001$). Similarly, attending the ante-natal clinic only once renders a pregnant woman susceptible to delivering a LBW baby although the relationship in this case was not statistically significant ($p > 0.05$).

The gestational age at booking is rather protective as women registering for ANC early (i.e. less than 28 weeks into pregnancy) are less likely to experience low birth-weight delivery unlike those who registered after 28 weeks. The association is statistically-significant ($p<0.001$). Also protective is the age of pregnancy as at the commencement of labour; with women going into labour at term being less likely to deliver a low birth-weight baby compared with women experiencing pre-term labour. The relationship is significant ($p<0.001$).

Table 15:- Predictors of adverse pregnancy outcome (low birth-weight) among ANC clinic attendees in Odeda LGA

Variable	Odds Ratio	95% Confidence Interval	p-value	Remark
Maternal Age (yrs):-				
< 20	48.6	5.3 – 440.5	0.001	Significant
≥ 20	1.0	═══	═══	
Marital status at booking:-	70.4	9.7 – 512.6	0.000	Significant
Single/never married	1.0	═══	═══	
Married				
Number of ANC clinics attended:-				
1	2.7	0.3 – 25.2	0.377	Not Significant
≥ 2	1	═══	═══	
Gestational age at booking:-	0.1	0.01 – 0.56	0.012	Significant
< 28 wks	1.0	═══	═══	
≥ 28 wks				
Gestational age at onset of labour:-				
Term	0.02	0.002 – 0.098	0.000	Significant
Pre-term	1.0	═══	═══	

CHAPTER FIVE

5.1 DISCUSSION

This study aims at evaluating those factors (social, economic, demographic or obstetric) that may be involved in determining pregnancy-outcome among clinic-booked pregnant women in Odeda Local Government Area.

The expected outcome of any pregnancy is the safe delivery of the baby at term, with the assurance of good health and survival of both mother and child. There is an adverse pregnancy outcome when either the mother or newborn baby suffers any injury or physiological imbalance as to compromise their. healthy living and survival. Some of the adverse maternal outcomes are bleeding during pregnancy, at delivery or in the pueperium, maternal anemia, pre-eclampsia / eclampsia, systemic infections, obstructed labour, uterine rupture and maternal death. Fetal outcomes on the other hand, include intra-urine growth restriction (IUGR), preterm births, stillbirths, low birth-weights, perinatal infections and perinatal deaths. For the purpose of this study, the low birth-weight of the babies born to the subjects was selected as the indicator of adverse pregnancy-outcome.

Demographic characteristics of the pregnant women involved in this study show that more than two-thirds majority (69.5%) of the pregnant women accessing antenatal care at primary health care level are in the 20 – 29 years age group. This is expected as this age-group conveniently falls under the age-group 20-34 years which Trussel and Pebley (1984) described as the "prime reproductive age-group".

The study found the likelihood of delivering a low birth-weight baby to be highest (12.0%) among teenage pregnant women compared to the 4.0% among the older women. This agrees with an earlier finding by Bacci et al (1993) that women under 19 years age have a higher (21.7%) rate of low birth weight than the 15.5% found among the older women. It therefore appears that young maternal age represents an important risk factor for adverse pregnancy-outcome in this environment. The incidence of low birth-weight as found in this study, is 3.4%, a value that is lesser than the 14.0% quoted for Nigeria by the World Health Organization (WHO/WHS, 2008).

There were more christians (68.3%) than muslims (31.7%) found among the study population. Adekunle (2002) had earlier found a similar proportional ratio of

79.0% christians to 15.7% muslims among women utilizing maternal health care services in another rural south-west Nigerian community.

A large proportion (93.5%) of the women were in marital union, (wether formalized or as co-habitation with the opposite sex) at the time of their booking for ANC. Being single and never married is a high risk-factor for delivering a low birth-weight baby in this study, and the relationship is statistically-significant. Absence of spousal support in the life of the single and never-married pregnant woman could mean a denial of the all-important moral and financial and support needed for healthy pregnancy and child-bearing.

A 73.3% level of education was found among the pregnant women in this study. This finding for women is much higher than the 58.0% found during the 2003 Nigeria Demographic and Health Survey, but comparable to the 69.1% quoted most recently for the country by the World Health Organization (W.H.O/W.H.S, 2008). Female education had no demonstrable significant effect on incidence of low birth-weight (as an indication of adverse pregnancy outcome) in the current study. This finding is understandable, as several studies including Uzochukwu et al (2004), Kenyan Demographic and Health Surveys (2003), Abou-Zahr and Wardlaw (2002) and Orji et al (2001) have positively linked uptake of ANC services by pregnant women to female education. Women exposed to adequate antenatal care, carry a lesser risk of low birth-weight infants, fetal deaths and also neonatal deaths, as found out by Raatikainen (2007).

The mean number of pregnancies, mean number of previous births (i.e. parity), and the mean number of surviving children among subjects of this study were 3.0 $\pm$ 1.8, 1.9 $\pm$ 1.7 and 1.6 $\pm$ 1.4 respectively. None of these three obstetric variables was on multivariate analysis, found to be predictive of adverse pregnancy outcome as indicated by low birth-weight in this study. However, the three obstetric variable findings seem to suggest a lower fertility rate compared with the 4.1 figure found for south-western Nigeria, and even the 5.7 found for the whole country by the 2003 NDHS. The most recent total fertility rate quoted for Nigeria for year 2006 is 5.5 (World Health Statistics/W.H.O, 2008).

On ANC service utilization by the pregnant women, several studies including Campbell and Graham (2006), Fiscella (1995) have reported lower rates of adverse

maternal and fetal outcomes among women who received ante-natal care. Others like Taguchi et al (2003) and Raatikainen (2007) even reported a direct association between number of antenatal visits and pregnancy outcome. Outcomes of all these studies are in support of the present research finding that attending the ANC clinic only once is a risk-factor for low birth-weight, even though the link was not statistically significant ($p = 0.377$). The mean number of ANC clinic visits by pregnant women in this community is 3.5 ± 2.4 times. Uzochukwu et al (2004) found an average ANC clinic attendance of nearly 6 times. Like number of clinic visits, time of last ANC visit as well as the interval between last visit and delivery are also equally important (Ekele and Audu, 1998). In the absence of complications, W.H.O now recommends a 4-visit regimen of *focused antenatal care (FANC)* which emphasizes quality as opposed to quantity of clinic visits (Villar and Bergsjo,2002; W.H.O,2003).

Early booking (i.e. before 28 weeks of pregnancy) was on the other hand found to be protective against having a low birth-weight baby, and the relationship is significant ($p = 0.012$). Pregnant women in this community generally book late for ANC as the present study found the mean gestational age at booking to be 27.1 ± 9.0 weeks. As many as 34.1% of the mothers attended ANC clinic for the first time in the third trimester of their pregnancy. This latter result is higher than the 12.5% reported by Adekunle (2002) and the 13.3% reported by Uzochukwu et al (2004), but comparable to the 36.5% found by Brian-D Adinma et al (2002). A year 2006 study by van Ejik et al found 23.0% in rural Kenya. Such women who booked late are likely to miss the optimal benefit of those health-promotive interventions, like jron-folate supplementation and intermittent preventive treatment (IPT) of malaria, both of which are capable of preventing adverse fetal and maternal outcomes (Ekwempu, 1990; Scholl et al, 1994; JHPIEGO, 2001).

Attaining term gestation before going into labour was found in this study to be protective against low birth-weight and the relationship is also highly statistically significant ($p = 0.000$). Fortunately, a great majority (91.6%) of these ANC-attending pregnant women studied attained term pregnancy prior to onset of labour.

5.2 CONCLUSSION

This retrospective study has shown that pregnant women utilizing public health facilities in Odeda LGA are generally married women of low socio-economic status. Majority of the study population have at least primary education, and a fertility rate considered lower than the general population. Although most of the women could garner at least three (3) clinic attendances before delivery, there exists the problem of late initiation of pregnancy care. There is a rather low incidence of low birth-weight deliveries (an index of adverse pregnancy-outcome) among the women studied. This finding could be attributed to the fact that the present study was a clinic-based study, the outcome of which would only be the tip of an iceberg when compared with community-wide studies. Young maternal age as well as single parenthood, were both found to exert significant positive influence on the incidence of low birth-weights in this community. The women are on the other hand, protected from having low birth-weight babies when they booked early for pregnancy care or when they attained term gestation before delivery.

5.3 RECOMMENDATIONS

Towards maximizing all the tested and implied benefits of antenatal care services to the people of Odeda Local Government Area, it is recommended that the authority in place at this level of governance takes necessary steps to :-

(1) Intensify health education efforts at both facility and community levels so as to discourage social vices like teenage pregnancy and child-bearing outside wedlock. The community should also be adequately mobilized to make better use of public health facilities, particularly during pregnancy and delivery.

(2) Provide gainful employment / women-empowerment programmes that would not only improve the women's socio-economic status, but also make them independent enough to decide to register early for ANC clinics and access emergency obstetric services if indicated.

(3) Put in place community-based pregnancy care services, as well as resuscitate home visits by community health extension workers, a practice which used to be a cornerstone of primary health care services in this part of the world. This recommendation will serve to complement the health facilities' efforts in

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fishing out pregnant women for early booking, and also keep a tab on the maternal and fetal well-being till delivery.

(4) Lastly, since this is a retrospective study, it will be an added advantage if the entire concept of pregnancy care is further evaluated so as to identify and control other real or perceived threats to the successful attainment of the millennium development goals on safe motherhood in this society.

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APPENDIX ONE

PROJECT TITLE:

FACTORS ASSOCIATED WITH PREGNANCY OUTCOME AMONG ANC CLINIC ATTENDEES IN ODEDA LOCAL GOVERNMENT AREA OF OGUN STATE

M.Sc. (EPID. & MEDICAL STATISTICS)

DATA COLLECTION SHEET

SECTION A: DEMOGRAPHIC VARIABLES

1. Ages as at time of Booking (specify) ..... years
2. Husband's age as at time of Booking (specify) ..... years
3. Religion: (a) Christianity ☐
   (b) Islam ☐
   (c) Aetheist/Traditional/Others ☐
4. Marital Status at Booking
   (a) Single/Never Married ☐
   (b) Married/Living together with a man ☐
   (c) Separated ☐
   (d) Divorced ☐
   (e) Widowed ☐
5. Maternal Educational Status
   (a) None ☐
   (b) Primary ☐
   (c) Secondary (specify highest class read) ☐
   (d) Post-secondary but not University (specify) ☐
   (e) Degree/HND ☐

6. Husband's Educational Status

(a) None ☐

(b) Primary ☐

(c) Secondary (specify highest class read) ☐

(d) Post-secondary but not University (specify) ☐

(e) Degree/HND ☐

7. Maternal Occupational Status (specify).....

(a) High (Professional/Managerial)....(specify) ☐

(b) Middle (Civil Servant) (specify) ☐

(c) Low (Petty-trading/Farming/Fishing/Student /Artisan/Housewife/Others (specify) ☐

8. Husband Occupational Status (specify).....

(a) High (Professional/Managerial)....(specify) ☐

(b) Middle (Civil Servant) (specify) ☐

(c) Low (Petty-trading/Farming/Fishing/Student /Artisan/Housewife/Others (specify) ☐

SECTION B: OBSTETRIC HISOTRY AND OUTCOME OF INDEX PREGNANCY

1. Client's gravid status
2. Parity status
3. Number of children alive
4. Past Medical/Surgical History
5. History of twinning in Family (a) Yes (b) No
6. Total number of ANC Clinics Attended .....
7. Gestational Age at Booking ..... weeks
8. Blood pressure at Booking ..... mmHg
9. Use of Ultrasound Scan (a) Yes (b) No
10. Complications identified in Pregnancy.....
11. Number of doses of Tetanus Toxoid received.....
12. Gestational Age before Onset of Labour .....
13. Labour augmented/induced (a) Yes ☐ (b) No ☐
14. Fetal presentation at Labour .....
15. Sex of the Baby: Male ☐ Female ☐
16. Birth-weight of the Baby..... kilograms
17. Maternal/child complications during Labour (a) Yes ☐ (b) No ☐
18. If yes, to Q17, specify.....
19. Use of Oxytocics/Ergometrine during Labour (specify)..... (a) Yes (b) No
20. use of Vitamin K during Labour (specify) (a) Yes (b) No
21. Duration of Labour: (a) Less than 12 hrs ☐
    (b) 12 – 18 hrs ☐
    (c) More than 18 hrs ☐
22. Duration of Pregnancy (specify)..... month
    (a) Preterm ☐ (b) Term ☐
23. Condition of Mother.....
24. Condition of Baby after Labour.....
25. Duration (i.e. no. of days) of confinement)..... days
26. If mother/child referred (a) Yes (b) No
27. Indication for referral (specify) .....

28. Where referred to .....

29. Cadre of Birth Attendant (a) Nurse-Midwife

(b) CHEW

(c) Health Attendant

SECTION C: HISTORY OF IMMEDIATE PAST/PENULTIMATE PREGNANCY

1. Duration of Pregnancy ..... months
2. Outcome of Pregnancy
   - (a) Aborted/Miscarried ☐
   - (b) Delivered term, alive ☐
   - (c) Delivered term, died within 1st week of life ☐
   - (d) Delivered preterm, alive ☐
   - (e) Delivered preterm, died within 1st week of life ☐
   - (f) Stillbirth ☐
3. Year of confinement
4. Place of confinement
   - (a) LG Health Centre
   - (b) General Hospital
   - (c) Tertiary Hospital
   - (d) Private Hospital
   - (e) TBA/Mission House
   - (f) At Home
5. Maternal complications.....
6. Child complications.....
7. Mode of delivery
8. Birth-weight
9. Mother/child referred (a) Yes ☐ (b) No ☐
10. If (a) in C9, indication(s) for referral.....

.....

.....

ODEDA LOCAL GOVERNMENT

Further communication should be addressed to:-

The Executive Chairman
Odeda Local Government, Odeda
and should quote the following reference

☎(039) 244097, 244145

Odeda Local Government
P.M.B. 1,
Odeda, Ogun State.

Our Ref: No.....

Your Ref: No.....

.....14th May, 2007....

To:

Dr. Abiodun Sorunke
Primary Health Care Co-ordinator
Odeda Local Government.

LETTER OF CONSENT

This is to convey to you the approval of the Executive Chairman of Odeda Local Government. **Hon. Emmanuel Soyemi Coker** that you be allowed to carry out your. Post graduate health survey on our patients registered in Obantoko and Orile-ilugun respectively.

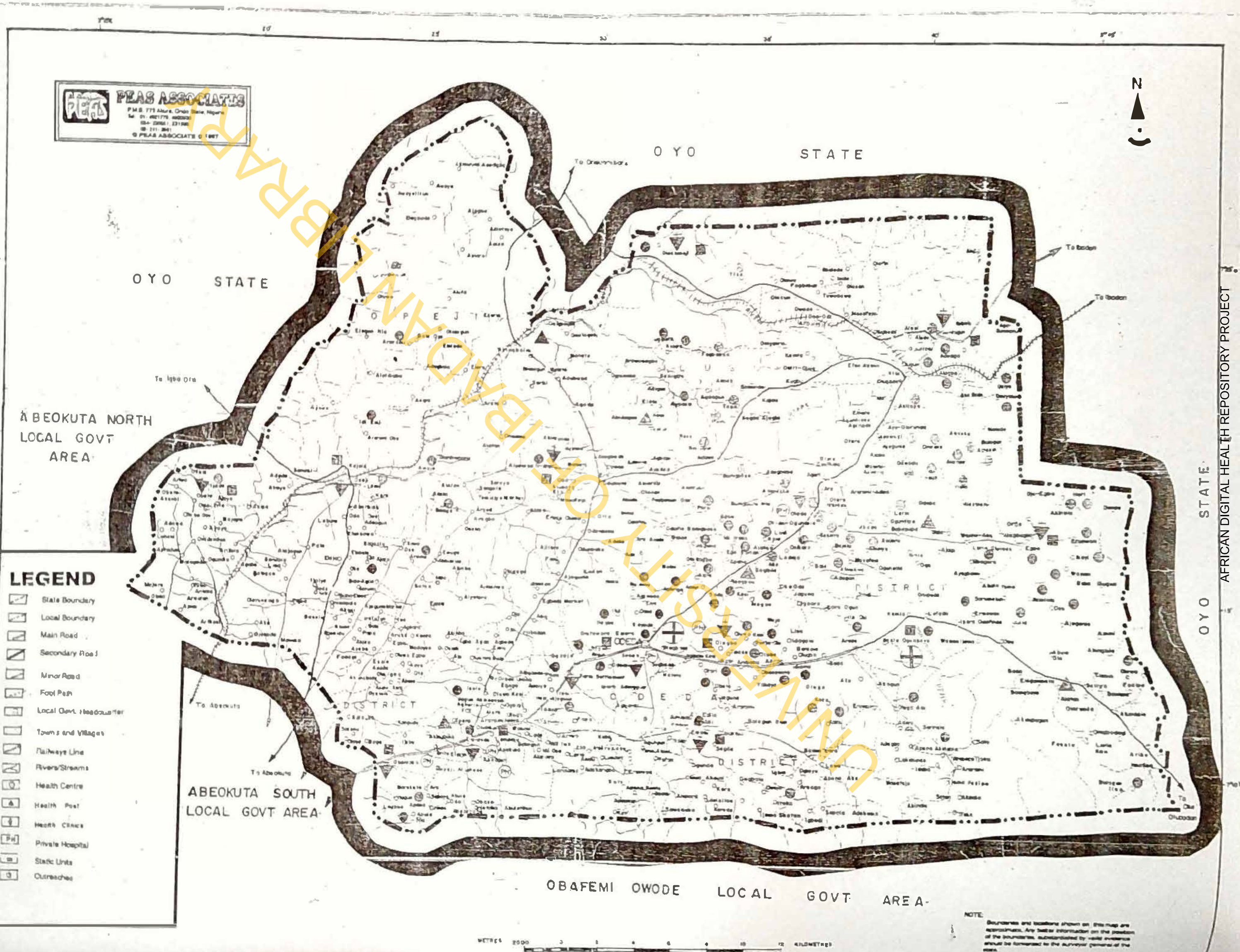
Wishing you the best of luck.

Yours faithfully,

S.O. Banneke
Principal Admin. Officer
For: Chairman.

ODEDA LOCAL GOVERNMENT

OGUN STATE, NIGERIA.



Courtesy: Office of Surveyor General, Ogun State.