Reducing MATERNAL & PERINATAL Mortality in Nigeria:

A Needs Assessment Study

THE NIGERIAN ACADEMY OF SCIENCE
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ACRONYMS AND ABBREVIATIONS

ABUTH	Ahmadu Bello University Teaching Hospital
ANC	Antenatal Care
C/S	Caesarean Section
CPD	Cephalopelvic disproportion
CHEW	Community Health Extension Worker
EBT	Exchange Blood Transfusion
ELSS	Emergency Life Saving Skills
EOC	Emergency Obstetric Care
FB	Faith Based Health Facility
FMOH	Federal Ministry of Health
IDI	In-depth Interview
LBW	Low Birth Weight
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
NDHS	Nigeria Demographic and Health Survey
PHC	Primary Healthcare Centre
PMR	Perinatal Mortality Rate
PNC	Postnatal Care
PPH	Post Partum Haemorrhage
PRV	Private Health Facility
SVD	Spontaneous Vaginal Delivery
TBA	Traditional Birth Attendant
TF	Tertiary Health Facility
TOP	Termination of Pregnancy
UCH	University College Hospital Ibadan
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNTH	University of Nigeria Teaching Hospital
WHO	World Health Organization

DEFINITIONS

Faith Based Health Facility (FB): Health facility owned and run by faith-based organizations such as churches, etc. Only FBs comparable to a standard secondary health care centre were used in this study.

Traditional Birth Attendant (TBA): Traditional midwives or lay midwives who provide pregnancy and childbirth care in the community. They may run independent facilities or do home-calls to provide birthing services. They are not regarded as skilled healthcare practitioners, but due to their popularity in Nigeria, many have received some form of training by the government in basic obstetric care.

Private hospital: Privately owned healthcare centre. Only facilities comparable to a standard secondary health care centre were used in this study.

Primary Healthcare Centre (PHC): Government owned healthcare centres, usually manned by a midwife. PHCs provide primary care and birthing services.
Public Hospital: Government owned tertiary healthcare centres.

EXECUTIVE SUMMARY

INTRODUCTION AND METHODOLOGY

With very poor maternal and perinatal mortality statistics in Nigeria, it has become apparent that urgent interventions are required in order for her to meet the MDGs 4 & 5 by 2015. From current records, a quarter of recorded 1 million under-five deaths are newborns and maternal mortality is estimated to range from 300 – 1500 per 100,000 live births (FMOH 2011, WHO 2011). Given Nigeria's population, which is the largest in Africa, its failure to make significant progress with regards to meeting the MDGs greatly influences Africa's achievement of these goals as a whole.

The health of a mother has significant implications on the health and survival of her newborn child; and in Africa, more than 50% of neonatal deaths occur within the first 24 hours of life. Thus, in ensuring a reduction in maternal and perinatal mortality in Nigeria, it is important to focus on providing a continuum of care; from the pre-pregnancy period through pregnancy, delivery and the neonatal period.

In view of the need to reduce perinatal and maternal mortality in Nigeria, the Nigerian Academy of Science (NAS) carried out this needs assessment study to obtain baseline information on obstetric care that can be used to inform interventions necessary for reducing perinatal and maternal mortality in Nigeria. The study was carried out in three cities; Enugu, representing the South-east, Ibadan representing the South-west, and Zaria representing the North-west regions of Nigeria. Public and private health facilities in the urban, sub-urban and rural communities of these cities were selected for use in this study. Three parameters were explored to achieve the objectives of this study:

The pattern of utilization of both formal and informal health facilities for the maternal and perinatal care in specific regions of Nigeria.

A technical audit of identified health facilities with reference to structural facilities, equipment and personnel.

An organizational audit of the process of receiving maternal and perinatal care at various levels, and identify barriers to optimal provision of care.

Using the above, the Academy will propose appropriate interventions for reducing maternal and perinatal mortality in Nigeria.

Four components were employed in order to obtain the above information:

A community survey to understand maternal knowledge and attitude towards pregnancy and childbirth complications; ante-natal and newborn care

An exit interview of women attending ANC in the chosen health facilities

A review of medical records in the chosen health facilities to assess the maternal and perinatal mortality over the past year

An infrastructure and health facility audit to assess availability of equipment necessary for providing essential obstetric care (EOC)

Questionnaires and in-depth- interviews were the tools used for data collection in this study.

KEY FINDINGS

Pattern of Utilisation of health facilities for obstetric care and delivery

In determining this, a number of factors were considered such as level of education, employment status, and knowledge base of maternal and newborn complications of the respondents. Results show that the majority of respondents see and understand the importance in using proper medical facilities for their ante-natal care and delivery. However, results from the review of medical records showing actual utilisation of the facilities shows large numbers attending ante-natal clinics across the zones, but a relatively smaller number of actual deliveries in the hospitals. One can infer from this that, most of the respondents attend ante-natal clinics in the hospitals and deliver their babies at home or with TBAs. This shows there is more to be done in educating women on the importance of delivering in the hospitals and not just attending ante-natal clinics.

Technical Study of Infrastructural Capacity

Infrastructural audit of the facilities showed that most of the facilities had the standard infrastructure necessary in providing obstetric care. Worthy of note though was the absence of potable running water in some facilities.

Also noteworthy in this audit is the paucity of some basic equipment across the zones such as radiant warmers, partograms and resuscitaires. These equipments are necessary in providing necessary obstetric and neonatal care. A significant finding in this audit is the absence of a CTG machine in the tertiary centres. A CTG machine is very important, and should be present in tertiary institutions where high risk pregnancies and deliveries are managed.

An audit of functional equipment in the baby care unit revealed a lack of some essential equipment in the tertiary centres such as blood gas analysers, bilirubinometers and oxygen concentrators. As tertiary centres are to provide apex care, it is expected that they have all the equipment necessary in providing adequate care of the mother and newborn especially in emergency situations.

Organisational Audit

Insufficient information was received in the personnel audit, especially in the Ibadan zone. Results seen show a good number of obstetric doctors, paediatricians and midwives in the facilities. Worthy of note here is the absence of regular training of the staff in all the facilities across all zones, particularly the midwives. Also only a few of the staff have received any emergency life saving skills (ELSS) training. The TBAs interviewed in this study seemed to have had some basic training, conducted by their respective governments.

Maternal and perinatal mortality ratios calculated from results received from this study are

significantly lower than the numbers calculated in previous studies (WHO 2010). MMR calculated from this study is 374 per 100,000 live births, while PMR is 45per 1000 live births. Obstructed labour was found to be the most common cause of death in women in labour, followed closely behind by PPH and pre-eclampsia. Unexplained fresh still births is the highest cause of perinatal mortality recorded, followed by neonatal deaths from obstructed labour in the mother.

RECOMMENDATIONS

- The government needs to fully integrate the national health insurance scheme to address financial challenges, which serves as a hindrance to the use of ANC services. Not only should government aim at full coverage of NHIS, efforts should also be directed towards ensuring that the scheme covers the needed drugs and treatment needed for ANC services

- There is a need for the introduction of Community Based Health Insurance Schemes; which could be community driven and or coordinated by the NHIS as a (P-P-P initiative) – Public, Private People initiative, with a focus on Maternal and Child Health Care

- It is important to increase awareness of the link between cultural values and health seeking behaviour since it is observed that culture featured prominently in utilization of ANC services most especially in the Northern part (Zaria) of the country

- Promotion of knowledge of child birth and newborn complications among the deprived populations (unemployed, uneducated and youths aged between 15-24 years) should be encouraged. Women need to be encouraged to adhere to the antenatal and delivery precautions

- As most women perceive that the best place to attend antenatal care is the PHC or health post, but delivery should be in the public hospitals, greater access to basic prenatal and emergency obstetric care at the primary level would have a great impact. In areas where these facilities are present, there should be an expansion of facilities for prenatal and postnatal care to reduce the long delays women experience before being attended to and for a faster response in the event of emergencies.

- The hospital records support the finding that a high number of people attend ANC at the health facilities, but the low number of deliveries at these facilities creates a basis for further investigation into why women go for ANC but do not deliver in the hospitals?

- Professionals with appropriate training can help develop efficient monitoring systems and emphasize health education, public information, health promotion, disease prevention, and social marketing of public health issues. This is more applicable in the Public Health Care Centres where women have claimed that access to doctors was relatively lower than in private hospitals.

- There is an expedient need for training and re-training of TBAs on ante and post natal care of patients. All the TBAs in Zaria claimed that though ANC is important, they have not been trained for antenatal care

- There is need for reliable and subsidized emergency transportation as women with complicated deliveries often require obstetric care, which is unavailable at their local health facilities

- Since more deaths occur from premature births, then fully functional baby care units in the relevant health facilities is necessary for the care of the ill or premature newborn

- It is important to procure new facilities as well as upgrade facilities of various health care centers. This is particularly necessary for the public hospitals, which have the highest recorded number of maternal deaths from SVD and instrumental deliveries.

CHAPTER 1

INTRODUCTION

1.1 MATERNAL AND PERINATAL MORTALITY IN NIGERIA

The adoption of the Millennium Development Goals (MDGs) at the United Nations Summit of September 2001 has several implications for different countries of the world. While some are making considerable progress towards the set goals, many developing countries are lagging behind. According to WHO (2006), many countries have set reduction of under-five and maternal mortality, fourth and fifth goals respectively, as key development goals. These two goals stipulate two-thirds reduction in under-five mortality (MDG 4) and three-quarters reduction in maternal mortality rates (MDG 5) by the year 2015; hence, emphasizing the importance of maternal and child health.

The proximate relationship between the health of a mother and that of the newborn is illustrated by the fact that perinatal mortality including all fresh stillbirths and neonatal deaths in the first week of life are linked to health related occurrences in the mother. Statistics further show the disparities between developed and developing countries on these two indicators. This difference in maternal mortality is often referred to as the largest discrepancy of all public health statistics as the risk of a mother surviving pregnancy and child birth is significantly higher in developing countries. Estimates from World Health Statistics (2011) reveal that ninety-nine percent of all maternal deaths in 2008 occurred in developing countries with a significant slow rate of decline in WHO African region. Similarly, the risk of neonatal death in developing countries is six times greater than developed countries, with Africa having the highest risk of 41 per 1000 live births (WHO 2006). In many parts of Africa more than 50% of neonatal deaths occur within the first 24 hours of life (Ayoola et al 2005). Also, the perinatal mortality rate of 62 per 1000 live births is the highest in the WHO regions. Regrettably, the rate of decline in perinatal and neonatal deaths is slower than those observed in most developing countries of the world (WHO 2011).

Nigeria, the most populous country in Africa with a population of about 167 million, is not excluded from the observed lag in achieving the fourth and fifth MDGs. The maternal mortality ratio for Nigeria is above the African average and ranges from 300 – 1500 per 100,000 births with

considerable regional variation (FMOH 2011, WHO 2011). The within country regional disparities show that maternal mortality is generally higher in the northern than the southern parts, with the highest ratio in the north-eastern geopolitical zone (NPC and ICF Macro 2009). In the same pattern, Nigeria has a relatively high number of newborn deaths in Africa; 422,000 annual perinatal deaths and 247,000 annual neonatal deaths (WHO 2006).

Factors responsible for the high maternal and perinatal mortality in Nigeria range from women's low educational status and socioeconomic attainment to health system associated factors. A good illustration of the weakness of the maternal health system in Nigeria is the Fatusi report (2003) on the availability of emergency obstetric care (EOC) facilities in 12 states of Nigeria. Overall, less than 20% of facilities met the criteria for EOC, with the private sector faring better than public health facilities (Fatusi and Ijadunola 2003). Identified direct causes of maternal mortality in Nigeria include haemorrhage (23%), sepsis (17%), hypertensive disorders (11%), unsafe abortion (11%), obstructed labour (11%), malaria (11%), anaemia (11%), and others (5%) (FMOH, 2007).

For perinatal mortality, a study in one of the foremost hospitals in Nigeria showed that sepsis, birth asphyxia, preterm delivery, and congenital disorders are the commonest causes of death (Ayoola et al, 205). This has been further researched in other hospitals around the country with similar findings (Kuti et al, 2005, Ojukwu and Ogbu 2004). Perhaps these poor health statistics are not without known reasons. The 2008 Nigeria Demographic and Health Survey found that 36% of women received no antenatal care at all; two thirds delivered at home without skilled attendants and more than half did not receive post-natal care within two days of delivery (NPC and ICF Macro 2009). Other studies from around the country have shown that a significant number of people still deliver outside of the hospitals (Ekele and Tunau 2007, Galadanci et al. 2007, Idris et al. 2006). As found in some of these studies, some of the women who even register in the hospitals for antenatal care end up delivering outside the hospital, in churches, at home and by traditional birth attendants. While some are attended to by skilled attendants, others are attended to by personnel whose levels of skill are not verifiable (Galadanci et al. 2007, Idris et al. 2006). Several reasons have been found to be responsible for this pattern of delivery in Nigeria. Maternal age and education as well as husband's education and occupation are some of the factors that significantly influence the choice of place of delivery (Bawa et al 2004, Nwakoby, 1994, Galadanci et al. 2007).

There has been a drive towards ensuring skilled attendants at all deliveries but the persistent choice to deliver outside the hospital has been a challenge towards achieving this. However, it is also noteworthy that even the formal health system is not without many lapses, and the health system is still plagued by inefficiencies, despite the financial investment in it (FMOH 2007). Thus, women often cited the poor quality service available at the health facilities as their reasons for choosing to deliver outside of the formal health facilities (Nwakoby 1994, Osubor et al 2006). Other reasons given included the fear of spiritual attack, high cost of services, privacy or the lack of transport. (Galadanci et al. 2007, Etuk et al 1999)

In summary, Nigeria as the largest black population in Africa and with one of the highest maternal and perinatal mortality rates in the world is in urgent need of evidence-based interventions to reduce these mortalities. It has now become imperative to shift towards looking at the continuum

of care; from the pre-pregnancy period through pregnancy, delivery and the neonatal period. In order to do this, there is need to:

Further explore the pattern of deliveries vis a vis the choice of the place of delivery

Determine the infrastructural capacity and estimate the needs of the health facilities if they were to provide essential obstetric care

Identify the gaps in service delivery which constitutes operational barriers to providing quality care for mothers and the newborn

This study aims to assess the above and based on the findings, offer interventions that can be used to reduce maternal and perinatal mortality in Nigeria.

1.2 OBJECTIVES OF THE STUDY

To document the pattern of utilization of both formal and informal health facilities for maternal and perinatal care in specific regions of Nigeria.

To conduct a technical audit of identified facilities with reference to structural facilities, equipment and personnel.

To conduct an organizational audit of the process of receiving maternal and perinatal care at various levels, and identify barriers to optimal provision of care.

CHAPTER 2

METHODOLOGY

2.1 DESIGN

This study consists of a cross sectional non-experimental design. The four major components of the study are

Community survey - to understand maternal knowledge and attitude towards pregnancy and childbirth related complications, antenatal care, birth delivery and newborn care of their recent birth or current pregnancy.

Health facility survey - through exit interviews to document antenatal care experiences of currently pregnant women at the selected public and private health facilities.

Review of available health records - to assess and document patterns of maternal and perinatal morbidity and mortality in selected locations of the country.

Infrastructure and health facility audit - to assess the availability of equipment, drugs and personnel for the provision of essential obstetric care using the WHO/UNFPA recommended checklist.

2.2 SAMPLE AND SAMPLING TECHNIQUE

Nigeria has a population of 167 million people spread over 6 geopolitical zones; North West, North East, North Central, South West, South East, and South South. As the maternal and perinatal mortality statistics vary across these zones of the country, three cities (each having a mix of urban, semi-urban and rural communities) from three geopolitical zones were chosen as study sites: Zaria in the North-West, Enugu in the South East and Ibadan in the South West. While the huge size of the country limits the number of cities or towns that can be covered in this study, the choice of these three sites was based on available health statistics. It should also ensure coverage of a spectrum of maternal and perinatal mortality rates ranging from good to bad in Nigeria.

2.2.1 Community survey

The sample size for community survey was based on 95% confidence level, 5% sample error and 10% non-response/refusal rate. The outcome variable used to calculate the sample size for community survey is "percentage assisted during delivery by skilled providers" (from NDHS 2008). Therefore, sample sizes of 300, 422 and 331 were estimated for Zaria, Enugu and Ibadan

respectively. A sample of women who had delivered in the last one year was selected for the community survey using multi-stage sampling technique. The first stage was to purposively select one urban and one rural area within each study location. The second stage involved random selection of enumeration areas in each community. Thereafter, households were screened by verbatim confirmation of eligible women, and simple random sampling technique was used to select the required size.

2.2.2 Health facility survey- Exit interview

Some public and private health facilities were also purposively selected within the three cities based on their strategic location and relatively high patronage for the exit interviews. Using the "percentage place of delivery" as the outcome variable in each state for public and private health facilities, a sample size estimate was generated. The values of the confidence level, sampling error and non-response rate were the same as that of the community survey. The sample comprised of women who are currently pregnant and received antenatal care at the health facility on the day of the interview. The sample size is as follows:

Enugu sample size estimate: Public health facility- 290; Private health facility – 370
Ibadan sample size estimate: Public health facility- 400; Private health facility - 360
Zaria sample size estimate: Public health facility- 220; Private health facility – 50

The eligible women were selected during their antenatal visits in the pre-marked public and private health facilities as shown below. The centres were pre-marked in a stakeholder meeting based on rural-urban location and ANC patronage.

Location	Public health facility	Private health facility
Enugu	• University of Nigeria Teaching Hospital • Agbani PHC • Ozalla PHC • Poly Clinic PHC • Asata PHC	• Mother of Christ Specialist Hospital and Maternity
Ibadan	• University College Hospital, Ibadan • Adeoyo General Hospital • Agbongbo Maternity Centre	• St Mary Catholic Hospital, Oluyoro • Christ Apostolic Church Maternity Home • Naomi Medical Hospital • New Day hospital
Zaria	• Ahmadu Bello University Teaching Hospital • Tundun Wada PHC • Dambo PHC • Baban Dodo PHC • Wuchichiri PHC	• St Lukes Anglican Hospital • Mayfair Clinics

2.3 DATA COLLECTION INSTRUMENTS

The study triangulates different methods of data collection: survey based data, secondary data from health facility and in-depth interviews with traditional birth attendants. The integration of data from these methods is necessary in order to achieve the stated objectives.

2.3.1 Community survey: Questionnaire Administration

Questionnaires were administered at home to women in the community who are either currently pregnant or gave birth within the last one year. The semi-structured questionnaire covered:
Demographic, household and socio-economic information of respondents
Maternal knowledge and attitude to pregnancy and childbirth-related complications
Prior and current experience with use of antenatal services
Experience with use of childbirth services
Accessibility and cost of antenatal and birth delivery service
Reasons for non-use of antenatal services

2.3.2 Health facility survey: Exit interview

Exit interviews were conducted for currently pregnant women who attended antenatal clinic on the day of the survey. The questions for the exit interviews include:
Demographic and socio-economic information of selected pregnant women
Experiences in the health care services just received from the health facility
Components of antenatal-care received
Cost of transportation and ANC services including household socioeconomic and asset information
Ratings of the health care provider; reasons for the level of satisfaction/dissatisfaction.

2.3.3 Review of available health record:

Secondary data from public and private health facility
Secondary data were retrieved from available health records to document the pattern of maternal and perinatal morbidity as well as mortality in selected public and private health facilities. The following pertinent issues were covered in the review:
Number of deliveries in the last one year
Mode of delivery in the last one year
Mode of delivery with number of perinatal and maternal deaths in the last one year
Major causes of perinatal and maternal mortality in the last one year
Major causes of maternal morbidity in the last one year
In-depth-interview with the Traditional Birth attendants (TBA)
In-depth interviews (IDI) were conducted for the Traditional Birth Attendants because of the need to document their perception of antenatal care. The in-depth interviews were semi-structured one to one discussions between interviewers and the participants. In all, ten IDIs were conducted in each of the study locations. The IDI guide questions include:
Antenatal care given to their clients
Knowledge, experience and management of Pregnancy complications
Birth delivery outcome in the last six months
Postnatal care for their clients

2.3.4 Infrastructure and Health Facility Audit: WHO/UNFPA recommended checklist

An infrastructure and health facility assessment checklist tool, based on that developed by WHO/UNFPA was used for this study. The assessment was on:
Availability of equipment in the labour/maternity ward, obstetric theatre and baby care unit

Drug and supplies available
Infrastructure
Personnel

2.4 DATA COLLECTION PROCEDURE

Approval was sought and received from the appropriate ethical review boards of each institution/ state for the study. There were five-day trainings of supervisors, field workers and data entry officers in Enugu, Ibadan and Zaria on administration of data collection instruments. Pre-tests were conducted in all the zones and findings from the pre-test were used to update the data collection instruments. The field work (administration of questionnaires) was carried out in the respondent's language of choice (local or English) in all the study locations between October and November 2011.

A verbal or signed consent was obtained from all the respondents after issues such as their consent and freedom to withdraw from this study at any time without fear were made clear to them. Confidentiality of the respondents was emphasized and observed. The in-depth interviews were conducted among the TBAs in a natural setting in order to avoid any bias. The trained interviewer, who was fluent in the native language of the TBA, assured the interviewee of confidentiality of the information given, which encouraged good rapport.

2.5 DATA ANALYSIS

The data collected was cleaned and checked for quality by the data entry manager in each study location. The study utilized both quantitative and qualitative methods of data analysis as appropriate for each objective. The valid percentage, that excludes missing cases, was used in the report of the percentage distribution and graphs. A test of association between selected maternal background characteristics and some pertinent variables in the study were done using chi-square test of independence.

The qualitative data from the in-depth interviews, consisting of verbal narrations, were analysed systematically and logically to understand the TBA perception and experience of maternal and perinatal mortality. *The first step was to organize the qualitative data by* transcribing notes from the tape recording of IDIs. It was thereafter reviewed by a competent third person to avoid alterations in context and meaning. The second step was shaping the qualitative information by assessing themes that emerge from the guides using Manual Content Analysis. This was done by sorting and noting the different categories of responses found under topic headings. The results from the quantitative and qualitative data were divided into the four different sections in line with the study objectives.

CHAPTER 3

RESULTS

3.1 SOCIAL DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

The socio-demographic characteristics of mothers who participated in the community survey are summarised in Table 1. A total of 1053 women who gave birth in the last one year or were pregnant at the time of survey were interviewed; 422 in Enugu, 331 in Ibadan and 300 in Zaria. More than half of the respondents are above 25 years and had at least secondary education in all the study locations. However, Zaria has the highest proportion of mothers with no formal education. Despite the distribution of the highest educational level in all study locations, the unemployment rate is lowest in Ibadan; just 5% of women interviewed are unemployed. About two-thirds of the respondents are either self-employed or in paid employment. Most of the respondents are married in Enugu, Zaria and Ibadan. However, only 28% were pregnant at the time of survey.

Table 1: Background characteristics of respondents

Characteristics	ALL n=1053 %	Enugu n=422 %	Ibadan n=331 %	Zaria n=300 %
Age in years				
• 15-24	28.3	23.6	28.0	35.2
• 25-34	58.1	65.5	55.8	50.2
• 35 and above	13.6	10.8	16.2	14.7
Education	9.1	0.7	3.6	27.0
• None	90.9	99.3	96.4	73.0
• Some				
Highest Education	16.5	6.4	26.6	21.1
• Primary	66.5	72.1	60.5	64.4
• Secondary	17.0	21.5	12.9	14.6
• Tertiary				
Occupation	24.9	31.4	5.1	37.7
• Unemployed	62.6	52.3	84.9	52.5
• Self employed	12.5	16.4	10.0	9.8
• Paid employment				
Marital status	97.1	95.7	97.3	98.7
• Married	2.9	4.3	2.7	1.3
• Otherwise				
Currently pregnant	71.9	60.7	92.1	64.8
• No	28.1	39.3	7.9	35.2
• Yes				

The respondents' household characteristics are shown in Table 2. The mean household size for all the study locations is higher than the Nigeria average of 4.4 (NDHS 2008). However, the proportion of households with more than five people is higher in Zaria than Ibadan and Enugu. The source of drinking water is a very good indicator for whether the water is suitable and healthy for drinking. Identified treated (purified) sources of drinking water are piped water, packaged water, tanker or borehole. The result shows that at least two-thirds of women in Ibadan and Enugu drink water from an improved source. This is slightly more than the national average value of 56% (NDHS 2008). On the contrary, about half of the women in Zaria live in households with non-treated source of drinking water.

Table 2: Household characteristics of the respondents

Characteristics	**ALL** n=1053 %	Enugu n=422 %	Ibadan n=331 %	Zaria n=300 %
Number of people in HH	46.4	51.2	49.8	35.7
• 1-4	33.1	33.3	36.9	28.6
• 5-6	20.5	15.5	13.2	35.7
• More than 6				
Mean HH size	5.4	4.6	5.2	6.8
Source of drinking water	34.6	18.8	51.1	38.6
• Piped water	32.1	27.1	20.2	52.3
• Well/ Spring/ Rain	33.3	54.2	28.7	9.1
• Bottled/ Tanker/ Borehole				
Type of toilet facility	48.3	70.9	44.7	20.2
• Flush	45.2	17.3	49.8	79.8
• Pit latrine	6.5	11.8	5.4	0.0
• Bush/field				
Household Item	93.6	92.8	95.1	92.9
• Radio	94.0	94.3	97.5	89.9
• Television	6.6	7.4	3.4	9.1
• Air conditioner	12.8	7.4	5.8	28.0
• Bicycle	36.4	34.8	19.4	57.4
• Motorcycle	31.1	31.7	23.4	38.5
• Fridge	54.2	62.1	43.1	55.4
• Generator	60.0	60.4	64.9	54.1
• Electric fan	91.3	94.5	91.1	87.2

Flush toilet is classified as an improved toilet facility in a household. The result shows that 70% of women interviewed in Enugu live in households with improved toilet facility. Pit latrines, unimproved toilet facility, are common in Zaria. Although some women in Ibadan use a flush toilet in their household, more women use pit latrine or the bush as toilet facility. Household

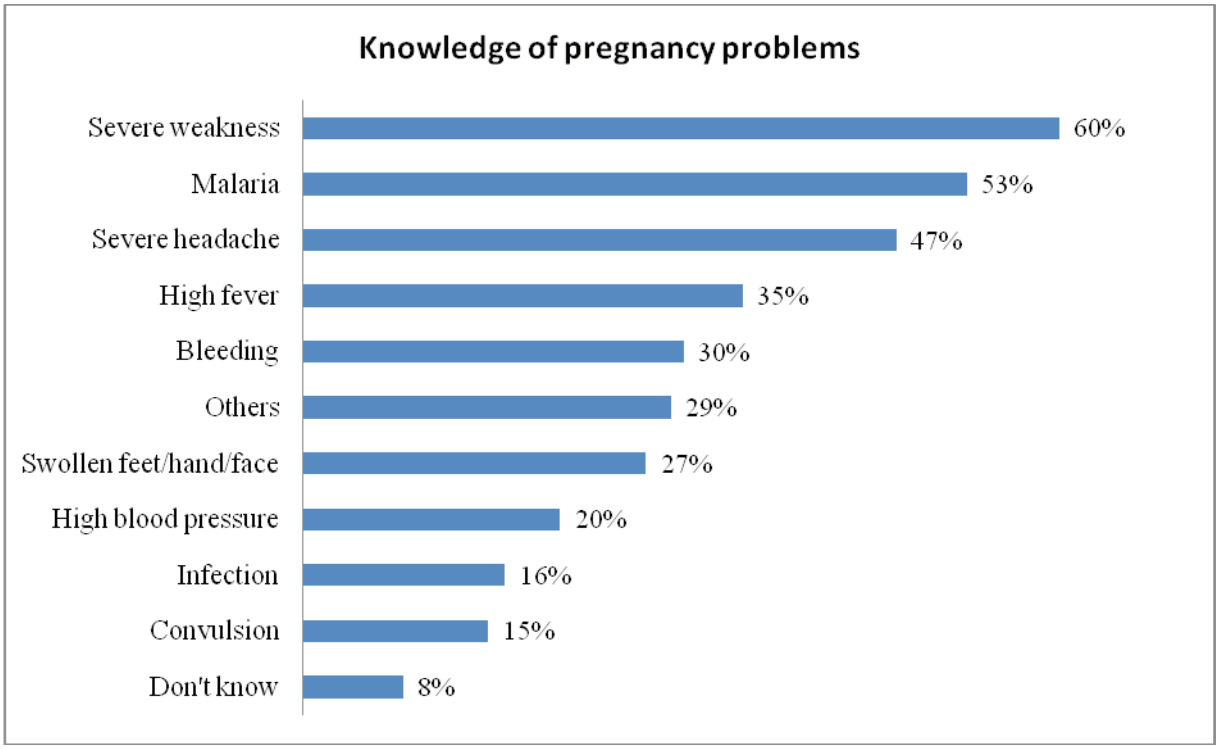
durable items such as radio, television, air conditioner, bicycle, motorcycle, fridge, generator and electric fan are measures of household socio-economic status. The common household items in all the study locations are radio, television and electric fan; at least, eight out of ten respondents have these items in their households. Also, about half of the women live in households with fridges and generators. Air conditioners, bicycles and motorcycles are not common household items.

3.2 PATTERN OF UTILIZATION OF FORMAL AND INFORMAL HEALTH FACILITIES IN NIGERIA

Knowledge of pregnancy and childbirth related complications in Nigeria

The knowledge of pregnancy and childbirth related complications were examined by asking the women a series of related questions. Figure 1 and Table 3 show the pregnancy problems identified by respondents for Nigeria and each study location respectively. Severe weakness is the most identified pregnancy problem by women who gave birth within the last one year or are currently pregnant in all the study locations. Malaria and severe headache are other common problems mentioned. Few women were able to identify high blood pressure, infection and convulsion as pregnancy related complications.

Figure 1: Pregnancy problems identified by household respondents in Nigeria



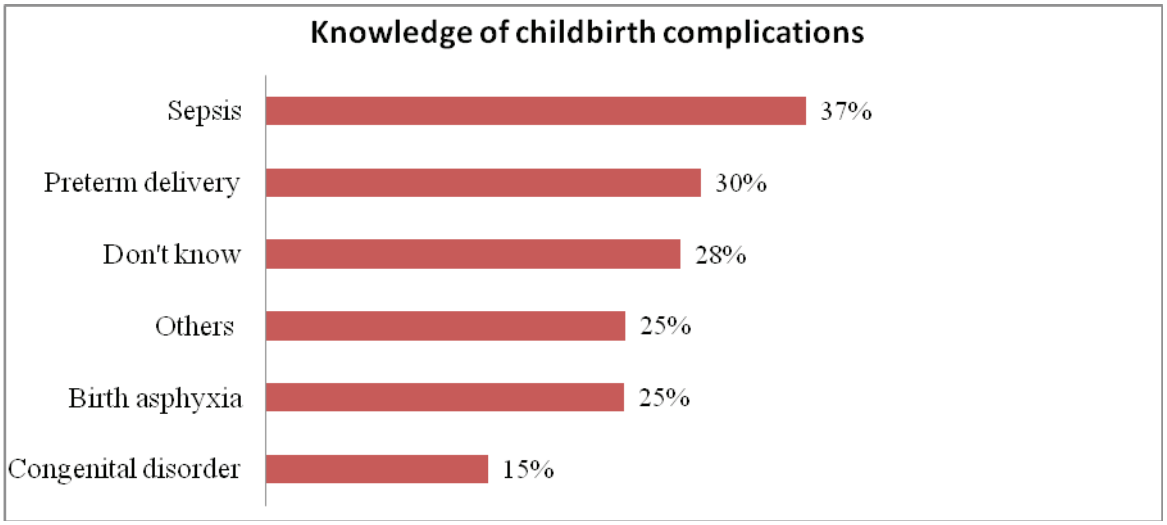
There is little disparity in the knowledge of pregnancy related problems among the study locations. Overall, 8% of the respondents claimed that they did not have any knowledge of any pregnancy complications or problem.

Table 3: Pregnancy problems identified by household respondents

Pregnancy problems *(multiple response)*	**Enugu (%)**	**Ibadan (%)**	**Zaria (%)**
Severe weakness	72.5	50.3	52.9
Malaria	69.0	48.1	34.7
Severe headache	64.0	30.2	41.4
High fever	45.0	31.8	23.9
Bleeding	30.3	24.4	36.4
Swollen feet/hand/face	40.5	4.9	32.7
High blood pressure	21.8	16.0	23.2
Infection	15.6	13.3	19.5
Convulsion	10.2	23.1	11.8
Others	40.3	18.2	25.6
Don't know	3.1	16.7	5.1

Knowledge about childbirth complications can lead to timely treatment and referral, which can prevent child death. Respondents were asked to mention known childbirth, perinatal and neonatal conditions that can lead to the death of the baby (Figure 2 and Table 4). Although, sepsis, preterm delivery, birth asphyxia, congenital disorders were mentioned, less than 50% of the respondents are knowledgeable about each of these childbirth complications in Enugu, Ibadan and Zaria.

Figure 2: Childbirth conditions that can lead to death of the baby identified in Nigeria



The commonly identified problem differs in all the study locations; preterm delivery is the most well-known in Enugu, birth asphyxia in Ibadan and sepsis in Zaria. The proportion of those who cannot identify any childbirth complication is highest (43%) in Ibadan.

Table 4: Knowledge of childbirth conditions that can lead to death of the baby

Childbirth conditions *(multiple response)*	**Enugu (%)**	**Ibadan (%)**	**Zaria (%)**
Sepsis	37.7	25.5	48.3
Preterm delivery	38.9	19.4	28.1
Birth asphyxia	30.3	32.5	7.5
Congenital disorder	14.7	18.8	12.0
Others	34.9	11.8	23.6
Don't know	14.9	43.3	31.5

The level of knowledge of pregnancy and childbirth related problems was related with selected significant maternal characteristics. Two new composite variables from the number of problems a woman can identify were generated. Therefore, those that can identify at least 5 out of 10 pregnancy problems, and 2 out of 5 childbirth related problems were recorded as shown in Table 5. Overall, less than 30% of respondents in the community survey can be said to have average knowledge of pregnancy and childbirth related complications.

Table 5: Percentage distribution of those that can identify some pregnancy and childbirth problems

Characteristics	Identify at least 5 pregnancy problems (%)	Identify at least 2 childbirth problems (%)
ALL	21.2	29.5
Age in years *		
• 15-24	13.7	21.0
• 25-34	22.6	34.3
• 35 and above	30.0	27.9
Highest Education *		
• None	24.0	21.9
• Primary	13.3	19.0
• Secondary	17.6	28.1
• Tertiary	41.1	49.7
Occupation *		
• Unemployed	19.2	25.3
• Self employed	18.4	26.3
• Paid employment	39.7	55.0
Study Location *		
• Enugu	27.5	37.7
• Ibadan	15.7	23.3
• Zaria	18.3	25.0

*- significant at p<0.001 for the two variables

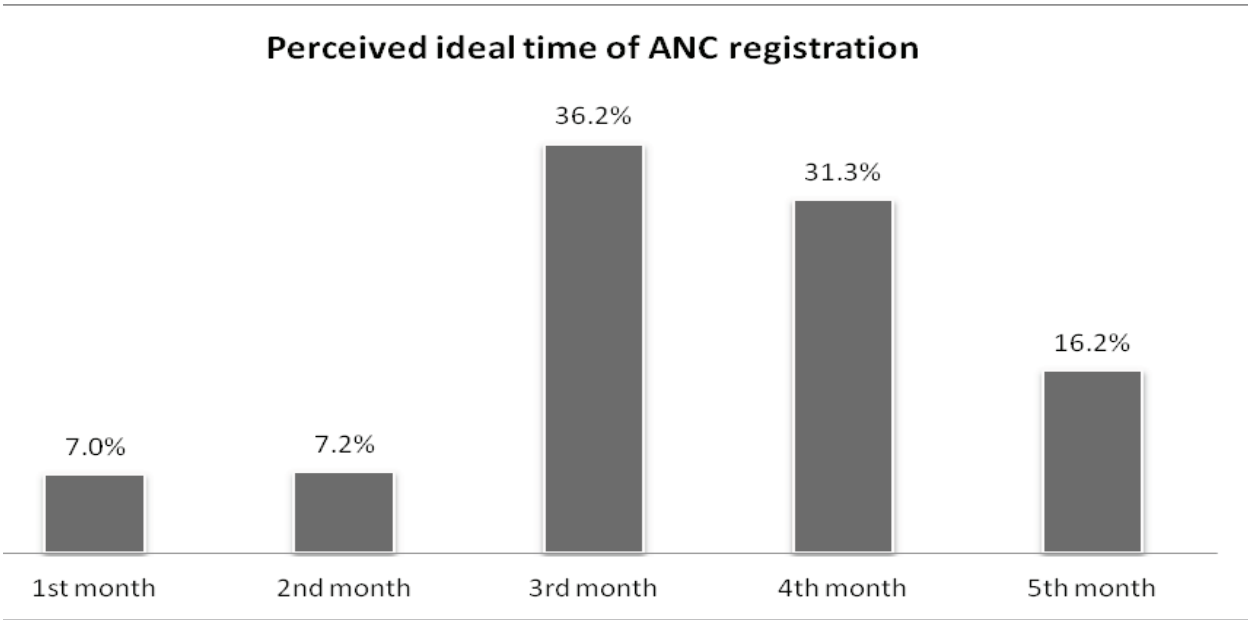
All the background characteristics examined on pregnancy and childbirth problems were statistically significant. Although the knowledge of pregnancy and childbirth problems was generally low among the respondents, it was lowest among women aged 15-24 years, those with primary education and unemployed women. As expected, women with tertiary education and in paid employment have significantly higher knowledge than others. The level of knowledge of pregnancy and childbirth related problems in Enugu is about 10% higher than Zaria and Ibadan.

Knowledge of Antenatal Care and Delivery in Nigeria

The knowledge of women about antenatal care and delivery was also examined in this study. This includes perceived ideal time of ANC registration, and perceived place for ANC and birth delivery. Figure 3 and Table 6 show the percentage distribution of respondents on their perceived timing of ANC registration. Less than 20% of respondents agreed that ANC registration should be within

the first and second months. The emerging picture from the community survey is that women generally perceived that ANC registration should be within the third and fourth months.

Figure 3: Perceived ideal time of ANC registration in Nigeria



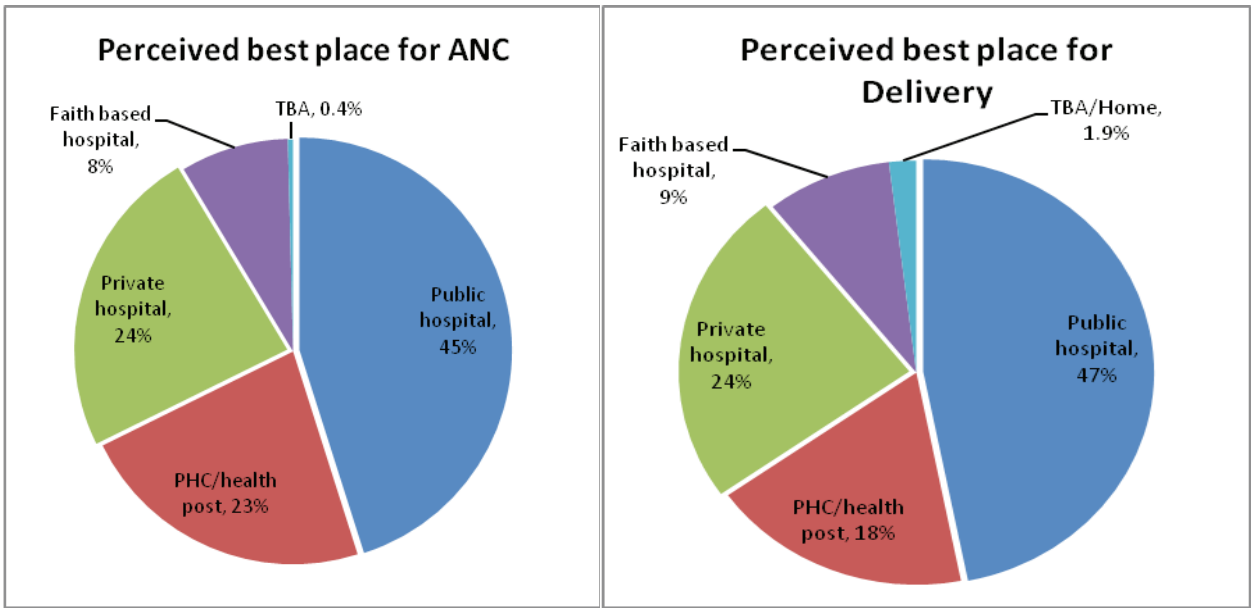
However, there is slight disparity in the study locations. More than half of women in Ibadan and Zaria would prefer to register for ANC between the fourth and fifth month while their counterparts in Enugu believed that registration should be within the first three months.

Table 6: Perception of mothers on ideal time of ANC registration by study locations

Perceived ideal time of ANC registration	Enugu n=414 (%)	Ibadan n=317 (%)	Zaria n=278 (%)
• First month	10.6	2.8	1.1
• Second month	9.4	5.7	3.6
• Third month	47.3	25.2	14.4
• Fourth month	17.6	28.7	35.7
• Fifth month and above	15.0	37.5	45.1

The place of ANC and that of birth delivery are crucial to the survival of mother and child. Hence questions were asked on perceived place of delivery and childbirth by women in the community. The responses on perceived best place for ANC and birth delivery are similar, except that more women delivered at home under the supervision of a Traditional Birth Attendant.

Figure 4: Perception on best place for ANC and delivery



A substantial proportion of the women perceived that public tertiary or secondary hospital is the best in Ibadan for either ANC or birth delivery. The responses from Enugu follow the same pattern as in Ibadan except that the percentage is lower. For Zaria, more women perceived that the best place to attend antenatal care is PHC or health post but childbirth delivery should be in a secondary or tertiary public hospital.

Table 7: Perception of mothers on the best place for ANC and delivery

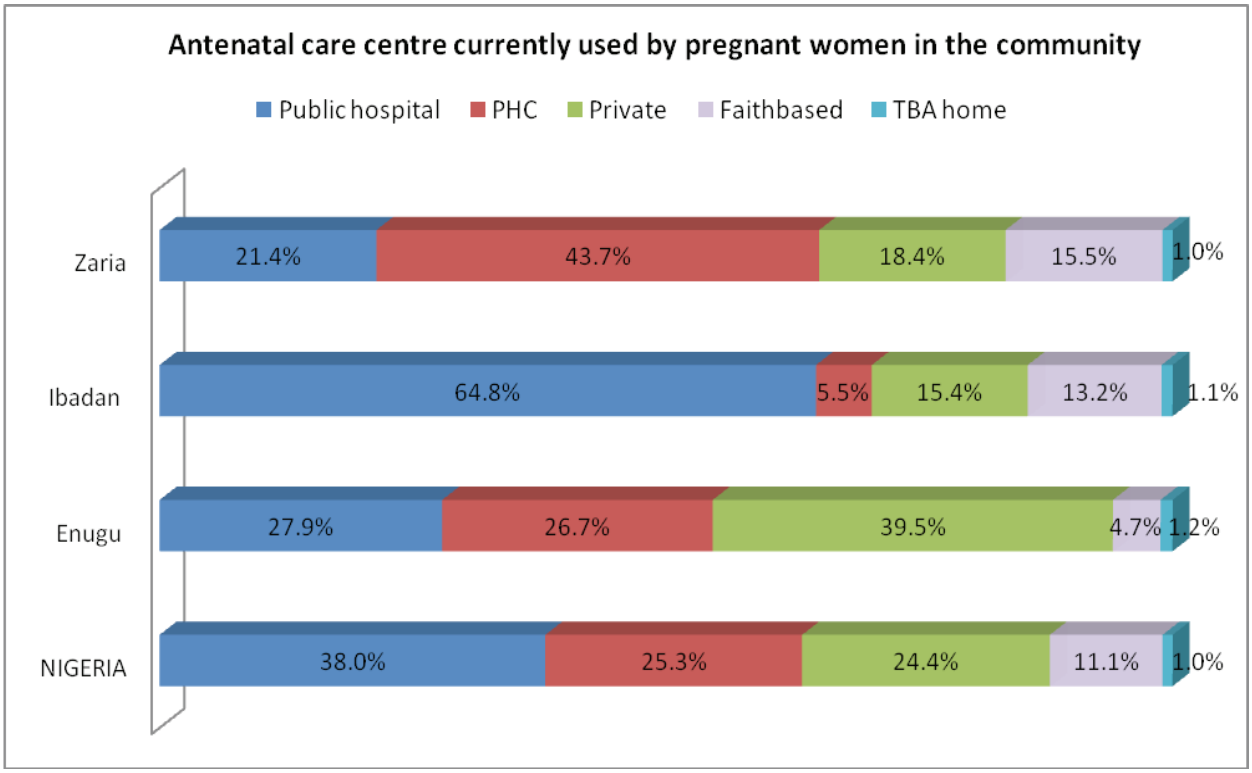
Perceived best place	**Enugu**		**Ibadan**		**Zaria**	
	ANC n= 420 **(%)**	Delivery n= 421 **(%)**	ANC n=331 **(%)**	Delivery n=330 **(%)**	ANC n= 295 **(%)**	Delivery n=298 **(%)**
• Public hospital	40.2	39.7	62.5	63.3	32.5	38.9
• PHC/health post	24.8	23.8	4.5	3.3	39.7	27.2
• Private Hospital	31.0	31.6	23.0	23.6	14.2	14.1
• Faith Based health facility	3.8	4.3	9.4	8.5	13.2	15.4
• TBA/Home	0.2	0.7	0.6	1.2	0.3	4.4

The results further show that a higher percentage of women who deliver in the traditional birth attendance home did not perceive patronising TBA's for ANC as best option. This is clearly demonstrated in all the study locations with Zaria having the higher proportion of those who delivered in the TBA home. More women perceived having delivery at home was best in Zaria than in Enugu and Ibadan.

3.3 EXPERIENCE OF ANTENATAL CARE

Antenatal care is important for the survival of mother and child. Proper care during pregnancy will significantly reduce the risk of maternal and perinatal mortality. Hence, women who were pregnant during the community and health facility surveys were asked series of questions relating to their antenatal care experience. The percentage distribution of currently pregnant women by their antenatal care centre is shown in Figure 5.

Figure 5: Antenatal care centre currently used by pregnant women in the community



There are different patterns of antenatal care centre attendance in the three study locations. More women attend private health facility than any other ANC centre in Enugu. While at least six out of ten pregnant women attend either tertiary or secondary public health facilities in Ibadan, a substantial proportion in Zaria attend primary health care centres for their ANC. It is generally observed that very few women indicate that they attend ANC at traditional birth attendant's home. This is also buttressed by the response of the TBA during the in-depth interviews.

Furthermore, exit interviews were conducted at selected public and private health facilities to document the current experiences of pregnant women during the period of the survey. The public health facilities include primary health centre as well as secondary and tertiary health facilities. Table 8 shows the background profile of pregnant women currently attending ANC at public and private health facilities. For the public and private health facilities, there is little difference in their background distribution. The proportion of women aged 25 to 34 years attending public health facilities is lower than those attending private health facilities. There is a remarkable difference in the religion of women attending the private health facilities, with more Christians than Muslims

attending the private health facilities. At least, six out of ten of the pregnant respondents were multi-gravid and in their third trimester.

Table 8: Background profile of pregnant women presently attending ANC at public and private health facilities (exit interview)

Background characteristics	Public Health facility n=1088 (%)	Private Health facility n=831 (%)
Age in years		
• 15-24	26.7	17.6
• 25-34	58.9	71.5
• 35 and above	14.4	10.9
Education		
• None	6.4	1.5
• Primary	15.4	10.2
• Secondary	40.7	45.4
• Tertiary	37.5	42.9
Religion		
• Christianity	48.4	71.2
• Islam	51.4	28.7
• Others	0.2	0.1
Present pregnancy is first		
• No	68.7	65.7
• Yes	31.3	34.3
Pregnancy trimester		
• First	5.6	5.2
• Second	27.0	29.2
• Third	67.4	65.6

Irrespective of the type of health facility used for ANC, the person conducting the antenatal clinic is very important. According to WHO (2004), a skilled health worker is at the centre of the continuum of care that women require to ensure the best possible health outcome for them and their newborn. The skilled health worker is defined as "an accredited health professional- such as a midwife, doctor or nurse- who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborn" (WHO 2004). Table 9 presents the description of the antenatal care provider during their current or prior pregnancy.

Seventy percent (70%) of the respondents in the community survey received ANC services from a nurse or midwife, while 26% received ANC services from a doctor. Less than 1% received

ANC service from a traditional birth attendant. About 80% of the respondents in Ibadan and Zaria received ANC services from a nurse or midwife. Enugu has a different pattern from other study locations; a percentage as high as 46% received ANC services from a medical doctor. This is more than the national average (22.6%) for those who received ANC from a doctor in the 2008 NDHS.

Table 9: Antenatal care provider

Significant characteristics	**n**	**Antenatal care provider (%)**				
		Medical Doctor (%)	**Nurse/ midwife (%)**	**Community health extension worker (%)**	**Community/ village health worker (%)**	**TBA (%)**
ALL women *(Last or current pregnancy)*	1033	25.8	70.7	1.4	1.5	0.8
• Enugu	417	45.6	53.5	0.2	0.1	0.5
• Ibadan	329	13.1	83.6	2.1	NA	1.2
• Zaria	287	11.5	80.8	2.1	4.9	0.7
Current ANC at Public HF	944	48.6	43.1	8.3	NA	*NA*
• Enugu	299	67.9	31.4	0.7	NA	*NA*
• Ibadan	421	37.5	60.1	2.3	NA	*NA*
• Zaria	216	44.0	25.5	30.6	NA	*NA*
Current ANC at Private HF	829	49.7	50.3	NA	NA	*NA*
• Enugu	366	96.4	3.6	NA	NA	*NA*
• Ibadan	363	9.4	90.6	NA	NA	*NA*
• Zaria	100	25.0	75.0	NA	NA	*NA*

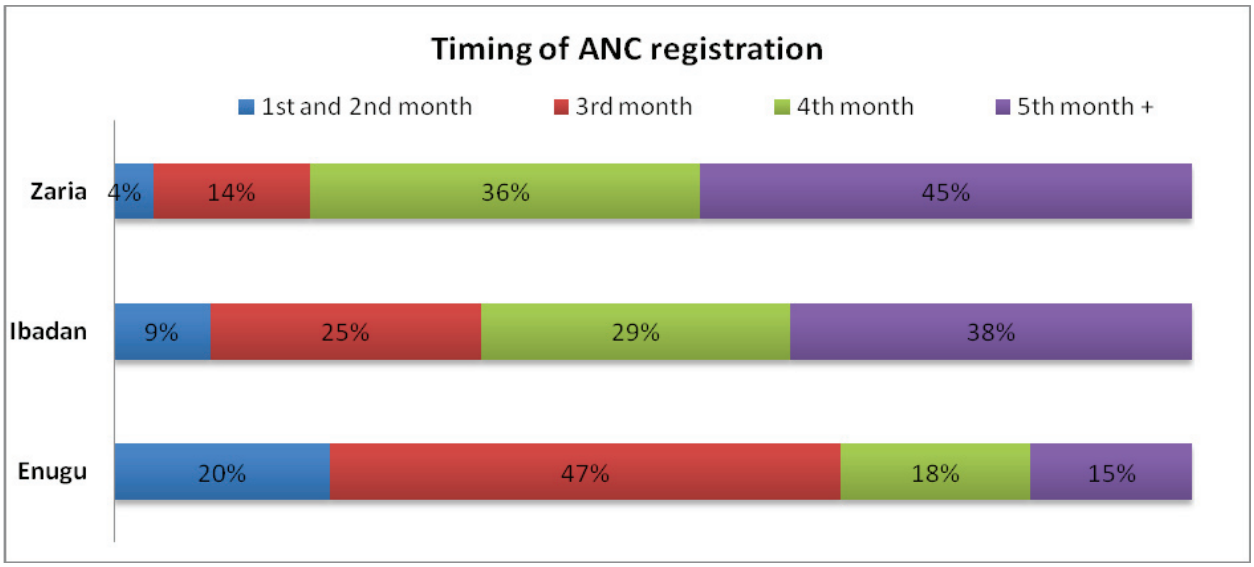
The results from the exit interviews show that about 96% received ANC service from a medical doctor at private health facility. This is contrary to findings from Ibadan and Zaria where at least seven out of ten women who attended ANC in a private health facility received service from a nurse or midwife. For the public health facility, the proportion of women in Zaria who received ANC service from CHEWs is significantly higher than other study locations. Two-thirds of women in Ibadan who attended public health facilities received the ANC service from the nurse. The percentage of those who received ANC services from a doctor in a public health facility is also high, though not like the private health facility. Overall, the findings from the community and

health facility survey indicate that majority (more than 92%) of the respondents received ANC care from a skilled health care provider.

Timing of first visit and number of ANC visits

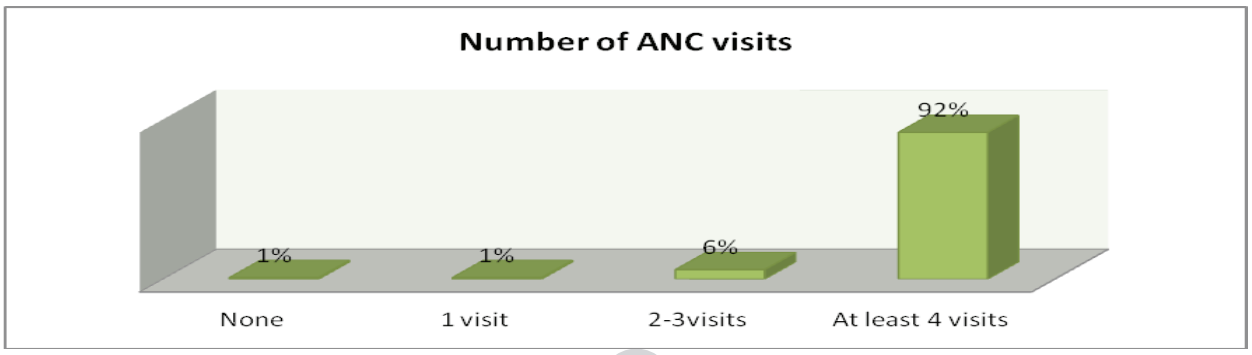
In promoting safe pregnancy, WHO (2010) recommends at least four ANC visits for women without complication. Also, timely registration before the fourth month is important as early detection of problems during pregnancy can lead to timely treatment (NPC and ICF Macro 2009). The timing of first ANC visit during previous or current pregnancy of respondents in the community is shown in Figure 6.

Figure 6: Timing of First ANC visit during last/current pregnancy of women



Sixty Seven percent (67%) of the respondents registered before the fourth month in Enugu, 34% in Ibadan and just 19% in Zaria. There appears to be late ANC registration in Zaria and Ibadan as more than two-thirds of the respondents registered after the third month. While as many as 11% registered within the first month in Enugu, only 3% and 1% did the same in Ibadan and Zaria respectively. Irrespective of the timing of first registration, at least nine out of ten women in this study had 4 or more ANC visits before their last delivery (Figure 7).

Figure 7: Number of antenatal care visits for last pregnancy (community study)



While 1% of the respondents claimed that they did not attend ANC, another 1% visited the ANC just once before their last childbirth delivery. Further analysis on the number of ANC visits by selected background characteristics is shown in Table 10.

Table 10: Number of ANC visits by background characteristics (community study)

Characteristics	Less than 4 visits (%)	At least 4 visits (%)
Age in years		
• 15-24	4.3	95.7
• 25-34	9.4	90.6
• 35 and above	9.6	90.4
Highest Education *		
• None	17.5	82.5
• Primary	13.5	86.5
• Secondary	5.3	94.7
• Tertiary	6.0	94.0
Occupation		
• Unemployed	4.1	95.9
• Self employed	9.4	90.6
• Paid employment	7.3	92.5
Study location*		
• Enugu	3.1	96.9
• Ibadan	10.2	89.8
• Zaria	12.2	87.8

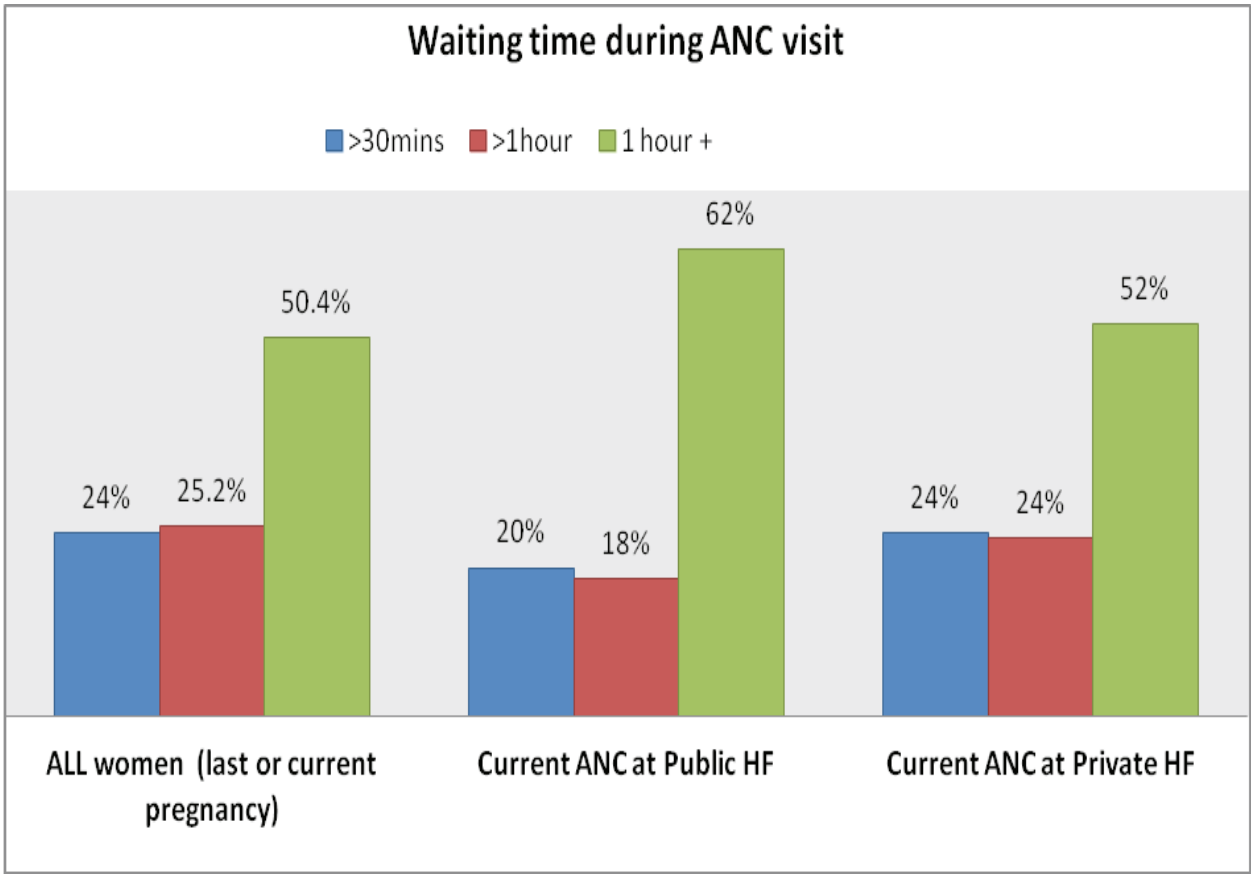
*- significant at $p<0.001$

There is significant association between maternal education as well as study location and number of ANC visits. Women with at least secondary school education had more ANC visits than others. There are also more women who attended ANC more than three times in Enugu than other study locations. Although not statistically significant, unemployed women had at least 4 visits or more than other groups of employment.

The waiting time at ANC visits (i.e. how long a woman waits before being attended to) can also affect women's predisposition to attending the clinic. The result shown in Figure 8 is categorized into three, those who waited for less than 30 minutes, less than 1 hour and more than 1 hour. The results from the women, who are either currently pregnant or gave birth within the last one

year, show slight disparities in the pattern of waiting time during ANC visit at public and private health facilities. About three-quarters of the respondents, from the community survey, said that they waited for more than 30 minutes. One out of five of those at the exit interviews in the public hospitals said they were attended to at the hospital within the first 30 minutes. Although still low, 25% made the same claim in the private hospital. The emerging picture overall is that about half of the women either currently pregnant or from the past experience waited for more than 1 hour before being attended to in the health facility.

Figure 8: Waiting time during ANC visits (community and health facility surveys)



The women's response on waiting time for the study location is shown in Table 11. In Enugu, more women waited for at least 1 hour at a private health facility compared with the public health facility during the ANC visit during the survey. This is contrary to findings from Zaria and Ibadan; more women wait at public than private health facility. It is, however, noted in Ibadan that the margin difference in waiting at public and private health facility during ANC visits is wide. Whereas 23% of the respondents in public health facility waited for less than 30 minutes, 43% did the same in private health facility.

Table 11: Waiting time at the ANC visits

Significant characteristics	n	Waiting time at ANC visits (%)		
		Less than 30mins (%)	30mins-1hour (%)	1 hour and above (%)
ALL women *(Last or current pregnancy)*	1034	24.4	25.2	50.4
• Enugu • Ibadan • Zaria	416 327 291	26.9 40.4 2.7	32.7 25.1 14.8	40.4 34.6 82.5
Current ANC at Public HF	944	19.7	18.2	62.1
• Enugu • Ibadan • Zaria	298 428 218	23.8 23.4 6.9	19.5 24.1 5.0	56.7 52.6 88.1
Current ANC at Private HF	830	24.3	23.6	52.2
• Enugu • Ibadan • Zaria	366 362 100	10.9 43.4 4.0	17.2 27.6 32.0	71.9 29.0 64.0

Components of ANC care received during ANC visits

The focused antenatal care approach is a shift away from the quantity of visits in the traditional approach to quality of service in the antenatal clinic. Therefore, components of care received during ANC visits is a good indicator of the quality of service. Table 12 presents percentage distribution of women on the components of ANC services. This includes percentage of women who were weighed, had blood pressure taken, urine sample taken and analysed, blood sample taken and analysed, received information on signs of pregnancy complications as well as received anti-tetanus injection. Generally, more than eighty percent of the respondents received all the components of ANC care for their last pregnancy.

The ANC component that was least received in Ibadan (during the last pregnancy and current ANC visits at public and private health facility) was information on the signs of pregnancy complications. Although the ANC care was well received in Enugu, the percentage of those who had their blood sample taken and analysed was the lowest during last pregnancy and current ANC in public and private health facilities. This pattern is similar in Zaria; however, the proportion of women who received the components of ANC care is lower. In addition, very few women who are currently

pregnant received anti-tetanus injection in the public health facility in Zaria.

Further analysis was also done on the component of ANC received in their ANC place for the last pregnancy. In all the health facilities, the coverage for blood sample test for pregnant women is below 90%; with public and faith–based health facilities ranking lowest. The most received ANC component is anti-tetanus injection in the public and faith-based health facilities. A higher percentage of women also received anti-tetanus injection in PHCs and private maternity centres. In addition, there is more than 95% coverage on informed signs of pregnancy complications in faith-based health facility and PHC.

The pattern of receiving ANC components is similar to those who gave birth within last six months before the survey and prior months (7-12months ago). However, information on signs of pregnancy complications and blood sample taken/analyzed are the least received within the two periods. The result also confirmed the general prescription that before the third semester, pregnant women should have received all the ANC components. There is a progression in the trimester by the type of ANC components received.

Table 12: Components of ANC care received

Significant characteristics	n	Components of ANC Care received (%)					
		Weighed (%)	Blood pressure measured (%)	Urine sample taken and analysed (%)	Blood sample taken and analysed (%)	Received information on signs of pregnancy complications (%)	Received anti-tetanus injection (%)
Last pregnancy	665	97.3	95.6	92.5	87.7	83.8	94.0
Last pregnancy by location:							
• Enugu	243	98.8	97.5	97.1	88.9	91.4	97.9
• Ibadan	237	98.3	97.9	94.5	96.2	70.0	91.6
• Zaria	185	94.1	90.3	83.8	75.1	91.4	91.9
Last pregnancy by ANC place:							
• Public hospital	77	94.8	96.1	87.0	76.6	94.8	98.7
• Faith based health facility	34	100.0	97.1	94.1	79.4	97.1	100.0
• Primary Health care centre	134	98.6	94.2	89.2	83.5	97.1	97.1
• Private maternity centre	80	98.8	98.8	98.8	83.8	90.0	96.2
Last pregnancy by time of delivery							
• Gave birth: 1-6 months ago	307	97.4	95.8	93.8	89.3	85.0	93.2
• Gave birth: 7-12 months ago	344	97.7	95.9	91.6	86.3	83.4	95.6
Status of current pregnancy in the community	49	87.8	85.7	81.6	69.4	75.5	77.6
• First trimester	136	94.1	94.9	86.8	77.2	90.4	86.0
• Second trimester	105	99.0	98.1	92.4	80.0	93.3	96.2
• Third trimester							
Current ANC in Public HF	1088	86.3	85.6	80.0	74.9	70.9	65.1
• Enugu	300	99.7	99.3	98.7	76.3	95.7	84.0
• Ibadan	430	99.3	99.3	97.7	97.0	75.1	87.7
• Zaria	358	59.5	57.5	43.0	47.2	45.0	22.1
Current ANC in Private HF	831	97.8	98.1	89.5	86.6	78.7	87.5
• Enugu	367	99.2	98.9	97.5	99.5	91.8	87.2
• Ibadan	364	96.2	96.7	89.6	90.1	66.2	84.3
• Zaria	100	99.0	100.0	60.0	27.0	76.0	100.0

3.4 KNOWLEDGE AND EXPERIENCE OF TBA ON ANTENATAL CARE IN NIGERIA

The traditional birth attendants in the study locations are between the ages of 24 and 65 years. The mean age of a TBA in Zaria is 39, while that of Enugu and Ibadan is 44 and 48 respectively. The highest formal educational attainment of TBAs is secondary education in all the study locations. All the TBAs in Enugu had some years of formal education and can read/write easily, while in Ibadan, one TBA did not have any formal education and most (7) of the TBAs can also read and write easily. Conversely, in Zaria, two TBAs did not have any formal education and only one out of ten TBAs can read and write. The median years of experience as traditional birth attendants are 14, 13 and 10 in Enugu, Ibadan and Zaria respectively.

TBA Antenatal Care for the client

While there are several definitions of antenatal care by TBAs in different study locations, the emerging common theme is taking care of the pregnant woman and foetus during the pregnancy. This is best summarized by responses below:

ANC means a pregnant mother to go a clinic to check her wellbeing and that of the baby, detect any abnormalities that may occur during pregnancy (31year old TBA in Zaria with 8yrs experience)

It means where you look at pregnant women and also check if baby in their abdomen is lying well. (34year old TBA with 12yrs experience in Enugu)

Antenatal is the care given to the pregnant women to save their lives and that of their babies in their wombs (52 year old TBA with 10 years experience in Ibadan)

All the TBAs in Zaria reported that, though ANC is important, they have not been formally trained to provide to provide antenatal care. Therefore they encourage their clients to attend ANC at nearby Primary Health Centres or General hospitals. This is buttressed by a 53 year old TBA with 10 years experience in Zaria who said:

No, I don't provide antenatal care because we were not given the materials and also not trained for that; only to take deliveries.

Another said:

No, we don't do antenatal care, but advice/inform the women to visit health facility for antenatal care. (39year old with 10 years experience in Zaria)

On the contrary in Ibadan and Enugu, all the TBAs reported that they conduct antenatal care for their clients. However, the description of their activities during the ANC visits fell short of accepted and standard care. Analyzing their responses, on some of the basic components of ANC visits reveal that majority of their activities revolve around taking the patients' blood pressure, measuring their weights, sending them to do a urine test and giving health talks. Very few TBAs send their clients to do blood tests and/or ultrasound scans.

When asked about the ANC activities for the client, a 50year old TBA in Ibadan with 15 years of experience said:

We check their eyes to see if they are pale; their height, urine test, health talk, blood pressure (B.P),

and they must be given immunization injection. They must also go for scan to know the position of their child, whether it is lying vertical or horizontal
Another however said:
We examine the hair, if there is a rash, we check the ear, we check the hand, armpit, the legs, the private part; and test the eyes if she has malaria and test her back if she has back problem. We check the ear if it is dry then we shall test her throat; we examine all of them critically. – ***60 year old TBA with 20 years experience)***

Although the responses in Enugu on ANC activities are similar to Ibadan, the health talk seems to be very important to some TBAs in Enugu as stated below:
I give health talk on what they should be doing e.g. bathing. Some of the women do not have their bath before coming. I then go ahead to tell them that coming for antenatal is very necessary to know how the baby is lying in the abdomen. We check their weight, blood, BP, urine and temperature – ***48 year old TBA with 15 years experience***

In Enugu, however, a 64year old TBA with 49 years working experience admitted the limitation of their practice as below
I check the blood level and sometimes, I check BP for some people. I do not check urine because I believe that our practice has limits

TBA Knowledge and Experiences of Pregnancy complications
There are several explanations of pregnancy complications given by the TBAs during the interviews. While some are not correct, majority of their perceived pregnancy complications are right. The pregnancy complications mentioned are itemised below for all the study locations.

Enugu	*Bleeding, Oedema in the legs (swollen legs), breech of the foetus, severe pain, vomiting at delivery, high blood pressure, malaria, high fever, typhoid, convulsion, placenta previa, hepatitis, baby ties cord by the neck, retarded foetus growth*
Ibadan	*Placenta previa, shortage of blood, high blood pressure, swollen legs, malaria, sleeplessness and masculine pelvic*
Zaria	*Anaemia, body swelling, hypertension, convulsions, fever, bleeding, Pre-eclampsia breach presentation, abortion, lower abdominal pain, fever, excessive spitting, body weakness, dizziness, vomiting, general body weakness, frequent sleeping, and head ache*

Some TBAs stated that they have experienced some pregnancy complications during care and delivery. As observed by a TBA in Zaria:
Yes I have, some days ago a woman delivered and after she started bleeding, I quickly gave her

misoprostol. I gave her 3 tablets, also inserted 5 tablets in her rectum, and the bleeding stopped. – ***52 year old with 8 years TBA experience)***

However, most of the complications are referred to the nearby Primary Health Centre, General Hospital or Comprehensive Health Centre as described below:
I examined her after gloving my hands I felt the leg of the baby instead of the head, so I told them we should go to hospital, I escorted them to Kwata Health Centre some distance to our community, from that facility they were further referred to General Hospital Kofan Gayan – Zaria and it was there she was finally delivered.....
I also took another one to Limi General Hospital also a distance, this one was a case of bleeding during delivery, we were also told during training that immediately we notice bleeding during delivery, we should not waste any time, we should take such women to any hospital and show them our identity card, that was what happened and the woman was immediately attended to and she delivered. (42 year old with 12 years TBA experience in Zaria)

A TBA in Enugu said:
One was a woman whose labour started at home and was rushed here; the child was in between her thighs. After delivery she started bleeding, the bleeding continued despite every effort to stop it. It was discovered in the hospital that she had internal tear.

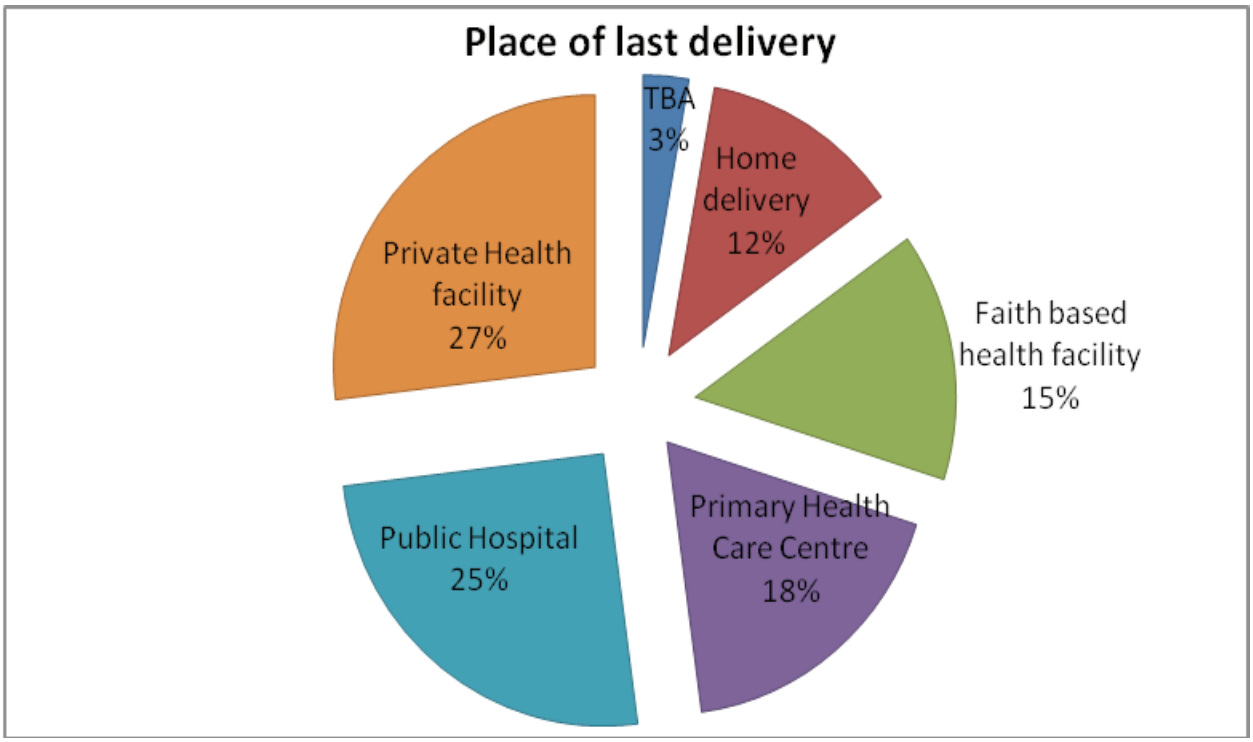
Another TBA in Ibadan shared her experience:
A pregnant woman came; she had already gone for scan, when she came here, she was about to deliver, I examined her and I noticed that the head of the baby was already descending. Suddenly I noticed what looked like the placenta coming out first, and it was not revealed in the ultra sound scan. I quickly told them to look for a keke NAPEP [tricycle], and they took her to a Doctor. When I got there [to the doctor's;, they said it was not the placenta that was presenting and she would deliver the baby without requiring any operation. I told them that they should allow her to deliver the baby with them. This is because we have been informed in training programmes that "midwives must not see blood" and anything that may cause bleeding, we must quickly refer lest we be found guilty of causing the death of someone. (50 year old with 15 years experience)

3.5 DELIVERY EXPERIENCE BY WOMEN IN THE COMMUNITY

Place of delivery

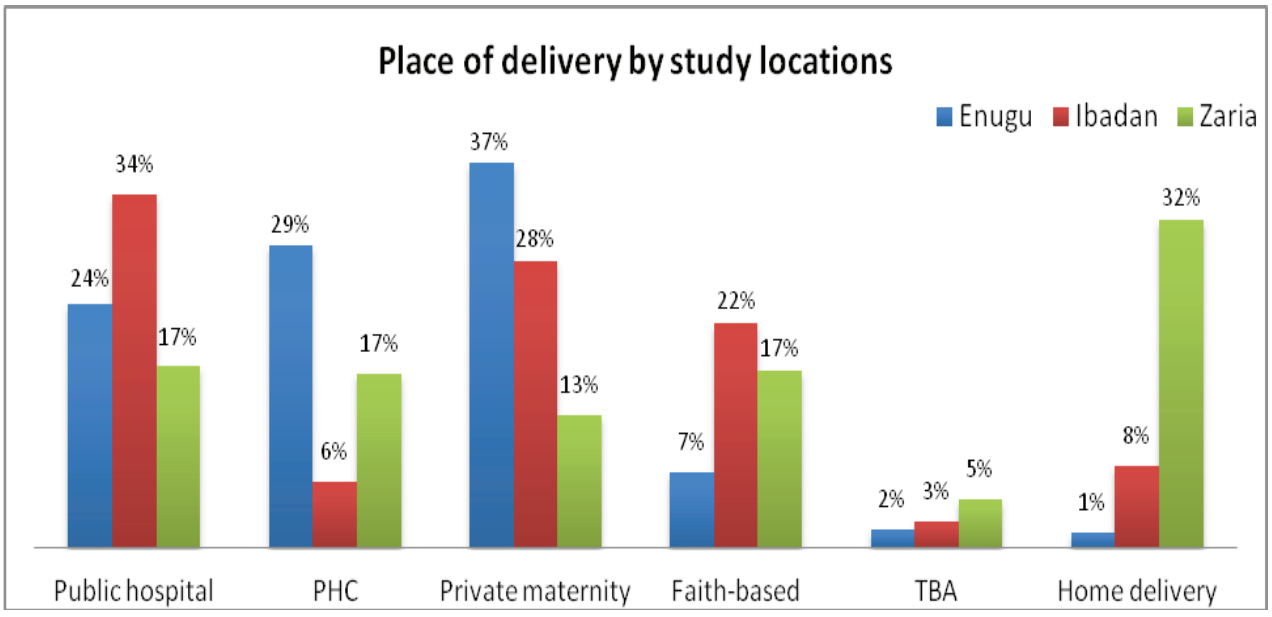
The place of delivery is also a significant consideration in reducing perinatal and maternal mortality. In the case of delivery in a healthcare facility, prompt attention can be given to mother and child if there are complications during delivery by skilled healthcare providers available in the centre. The percentage distribution of all live births within one year preceding the survey is presented in Figure 9.

Figure 9: Place of last delivery by women in the community (n=952)



43% of the women delivered in a public facility; 25% in public secondary and tertiary hospitals, and 18% in primary health centres. This differs from the 2008 NDHS report which had 20% of deliveries being in a public health facility. The percentage distribution by place of delivery in each study location is presented in Figure 10.

Figure 10: Place of last delivery by women in the community



Most deliveries within the last one year in Enugu took place in private maternity centres, PHCs and public hospitals. Also, the public tertiary and secondary hospitals are most patronised in Ibadan, closely followed by private and faith-based health facilities. However, very few mothers in Ibadan delivered in the PHC. There is a different pattern of delivery in Zaria where home delivery, under the supervision of a TBA, is prevalent. Although, some women delivered in other centres, the percentage of home delivery is almost twice each of the other centres. For instance, for one delivery in a private hospital in Zaria, there will be two home deliveries. The overall picture is that women preferred delivering in a public hospital as stated in the preceding section, but the pattern is not the same for different parts of the country. There is preference for home delivery in the northern part of the country.

Furthermore, various questions were asked about other important delivery experiences from mothers who gave birth within a year preceding the survey (Table 13). These include mode of delivery, health problems after delivery, duration of stay after delivery and the person who examined them before discharge from the health facility.

Table 13: Childbirth delivery experience by women in the community

Duration of stay	**ALL women (%)**	**Enugu (%)**	**Ibadan (%)**	**Zaria (%)**
Mode of Delivery by respondents	94.8	91.4	96.6	97.3
• Normal	5.1	8.6	3.1	2.7
• Caesarean	0.1	0	0.3	0
• Vacuum assisted				
Health problems after delivery	5.1	6.4	2.1	7.0
• High blood pressure	9.9	10.4	5.3	14.8
• Swelling of the legs	7.6	9.8	5.6	7.4
• Bleeding after delivery	4.0	4.4	1.1	7.0
• Retained placenta	5.6	8.4	2.1	6.2
• Convulsion	2.9	5.1	2.8	0.4
• Fever	70.5	62.0	84.2	65.0
• No health problem				
Duration of stay after delivery	25.7	2.3	23.7	84.1
• On day of birth	36.7	50.7	32.5	11.7
• 1 day	30.1	36.4	38.0	0.7
• 2-3 days	5.9	7.9	4.7	3.4
• 4-7days	1.6	2.6	1.1	0
• After 7 days				
Person who checked health before discharge	37.7	42.2	29.1	43.4
• Medical Doctor	55.8	54.5	59.5	52.4
• Nurse/midwife	1.6	1.1	3.2	00.5
• Traditional birth attendants	0.5	0 1.7	1.0	3.2
• CHEW	1.5	0.6	0.3	7.4
• Community health workers	5.3		9.4	
• Nobody				

Majority of the respondents in all the study locations had normal deliveries for their last birth. The percentage of respondents that noted that their last delivery was through caesarean section is high in Enugu when compared to other parts of the country. Vacuum assisted delivery is not very common; the few women who mentioned this mode of delivery were found only in Ibadan. In addition, about 70 percent of women claimed that they did not have any health problems after delivery. This proportion of women with no health problems is higher in Ibadan than other locations. From the remaining 30% who had problems after delivery, leg swelling and bleeding were common occurrences.

The duration of stay after delivery should theoretically depend on the health of the mother and child. There is an extreme situation in Zaria, where as many as 84% of respondents said they were discharged on the day of delivery. In Enugu and Ibadan, about 40% of the respondents spent more than 1 day in the hospital after delivery. It is important that a skilled health care provider should check the mother and child before they are discharged from the hospital. In Nigeria, as found in all the study locations, a skilled health worker such as a medical doctor or nurse examined the health of about 85% of the mothers and children before discharge.

3.6 ORGANIZATIONAL AUDIT OF THE PROCESS OF RECEIVING MATERNAL AND PERINATAL MORTALITY

This section reviewed the health records in selected health facilities in Nigeria. While it was generally observed that there was a poor record system in most of the facilities, the few records available were used to examine the number, outcome and mode of deliveries in the last one year, major causes of perinatal and maternal mortality in the last one year, and major causes of maternal morbidity in the last one year.

Number of deliveries

The number of those who attended antenatal clinic (at all the health care facilities) over the last one year is shown in Table 14. Fourteen percent (14%) of those who attended antenatal clinic delivered their baby in the health facility where they received the ANC. This is consistent with Nigeria Demographic and Health Survey 2008 statistics on ANC and place of delivery; the percentage of those who attended ANC is 58 while childbirth delivery in health facility 35. More women in Zaria attended the antenatal clinic than in the other study locations. However, they have the lowest percentage of deliveries in the health facilities. About one in five of women who attended ANC in health facility in Ibadan also delivered in the same place. Although, the proportion of those who attended ANC but did not deliver in that particular health facility is generally low for all, the lowest observed is for those who use primary health care centres.

Table 14: Number of deliveries, ANC attendance and PNC attendance

Significant variables	Number who attended ANC	Number of deliveries	Number who attended PNC	% number of deliveries /ANC attendance **(%)**	% PNC attendance / number of deliveries **(%)**
Last one year (Overall)	103622	14878	6679	14	45
Last one year by study location					
• Enugu	22697	3085	697	14	23
• Ibadan	34196	6627	4599	19	69
• Zaria	46729	5166	1383	11	27
Last one year by type of facility					
• Public hospital	36651	6676	1794	18	27
• Primary Health care centre	51465	5438	4761	11	88
• Private health facility	2189	514	1	23	0
• Faith based health facility	13317	2250	124	17	6
During 4-week period of survey	5367	655	199	8	30
Period of survey by study location	457	128	22		
• Enugu	1651	68	NA 177		
• Ibadan	3259	459			
• Zaria					

The record available during the 4-week period of the survey shows that the number of deliveries in Enugu, Ibadan and Zaria is in a ratio of 1:4:7 respectively. This implies that for any one birth in the health facilities in Enugu, there will be about four births in Ibadan and seven births in Zaria. This is unlike the pattern observed for the number of deliveries in the last one year; a ratio of 1: 1.5: 2.1 for Enugu: Ibadan: Zaria.

Postnatal care involves systematic follow-up after delivery, which can further enhance the child survival during infancy. Forty-five percent (45%) of respondents who delivered their babies in the health facility actually return for postnatal care in the same place. This is particularly remarkable in Ibadan, where more than two-thirds of those who delivered in a health facility received postnatal care. Conversely, this proportion is low in Enugu and Zaria. In respect of the health facility used for deliveries, the PNC return for PHC is strikingly higher than others.

Delivery outcome from available health record

The crude estimate of maternal mortality ratio and perinatal mortality rate were calculated from the available records on delivery outcome in the health facilities. Table 15 presents the delivery outcome for mothers while Table 16 shows that of the newborn for the last one year preceding the survey in the selected health facilities.

Table 15: Number of deliveries, ANC attendance and PNC attendance

Significant variables	Delivery outcome for Mothers Dead		Delivery outcome for Mothers Alive		MMR per 100,000 live births
	Freq	%	Freq	%	
Last one year (Overall)	52	0.3	14841	99.7	374
Study location					
• Enugu	22	0.7	3135	99.3	
• Ibadan	17	0.3	6602	99.7	
• Zaria	13	0.3	5104	99.7	
Type of facility					
• Public hospital	18	0.3	6650	99.7	
• Primary Health care centre	19	0.3	5427	99.7	
• Private health facility	-	0.0	509	100.0	
• Faith based health facility	15	0.7	2255	99.3	
During 4-week period of survey	0	0.0	655	100.0	
During 4-week period of survey by study location					
• Enugu	0	0.0	128	100.0	
• Ibadan		0.0	68	100.0	
• Zaria	0	0.0	459	100.0	

*MMR- maternal mortality ratio

Maternal mortality ratio is calculated by dividing recorded number of maternal deaths by the total recorded number of live births in the same period and multiplying by 100,000. To avoid unreliable statistics from high relative standard error, MMR estimates can only be calculated with a minimum of 10,000 live births and 20 maternal deaths per year. In summary, over the last one year, the maternal mortality ratio for the selected areas is 374 per 100,000 live births. At least, 3 out of 1000 women died during delivery in the health facilities in Ibadan and Zaria while 7 out of 1000 died in Enugu. Although, the health records available for private health facilities show that there was no instance of maternal death in the last one year, it is observed that private health facilities often refer complicated cases during childbirth to the public tertiary hospitals. The percentage of death in faith-based health facilities is about twice that of the public hospitals and primary health care centres. There were no maternal deaths recorded during the four-week period.

Furthermore, the perinatal mortality ratio is calculated by dividing recorded number of fetal deaths of 7 days to 28 weeks post-birth by the total recorded number of live births in the same period and multiplying by 1,000. PMR estimates can only be calculated from a minimum of 20 fetal and newborn deaths per year because of high relative standard error that can give unreliable statistics. The overall perinatal mortality rate is 45 per 1000 live births for the last one year. The highest perinatal mortality rate is from Enugu (51) while the lowest (39) is from Ibadan. While an estimate could not be calculated for private health facility because of the low number of deaths, the result shows that perinatal mortality rate is 57 and 34 per 1000 live births in public hospitals and primary health care centres respectively. Also, the values during the 4-week survey period were too low to estimate perinatal mortality rate. It is however observed that about 7 percent of newborns died in Enugu and 5 % in Zaria during this period.

Table 16: Number of deliveries, ANC attendance and PNC attendance

Significant variables	Delivery outcome for Babies Dead		Delivery outcome for Babies Alive		PMR per 1,000 live birth
	Freq	%	Freq	%	
Last one year (Overall)	658	4.5	13919	95.5	45
Study location					
• Enugu	163	5.1	3053	94.9	51
• Ibadan	251	3.9	6130	96.1	39
• Zaria	244	4.9	4736	95.1	48
Type of facility					
• Public hospital	368	5.7	6125	94.3	57
• Primary Health care centre	183	3.4	5193	96.6	34
• Private health facility	9	1.8	503	98.2	NA
• Faith based health facility	98	4.5	2098	95.5	45
During 4-week period of survey	31	4.9	631	95.3	
During 4-week period of survey by study location					
• Enugu	9	7.3	123	93.2	
• Ibadan	0	0.0	68	100.0	
• Zaria	22	5.0	440	95.2	

*PMR- Perinatal mortality ratio

Birth delivery outcomes in the last six months among the Traditional Birth Attendants
The TBAs described their birth delivery outcomes in the last six months by stating the number

of deliveries, number of babies and mothers alive as well as those that died. This is presented in Table 17.

Table 17: TBA delivery outcomes in the last six months

Study location	Number of deliveries	Mother's outcome (freq)		Baby's outcome (freq)	
		Alive	Dead	Alive	Dead
Enugu	78	78	0	77	1
Ibadan	65	65	0	65	0
Zaria	221	221	0	213	8

The reasons given for the deaths of babies include still birth, jaundice, prolonged labour and premature babies. In the words of one the TBAs:
She delivered after about five hours from when I started conducting her labour and I did not notice any signs to suggest any complications; it was not her first delivery but the second. I feel the baby was destined to be born still birth. (37 year old with 7 years experience in Zaria)
A TBA with the highest number of baby deaths (5 out of 35 deliveries) said
Due to prolonged labour, the babies were very weak and later they died; Pre-mature babies and jaundice. (31 year old with 8 years experience in Zaria)

TBA Postnatal care
Although some TBAs claimed to have postnatal care for their clients, majority of them refer the mother and her newborn baby to the health facilities in the area. As stated by one of the TBAs in Enugu
We advise the mother to take their baby for immunization in the hospital and for further PNC like baby weight. I only encourage the mothers to come after two weeks to check if their womb has gone back to normalcy. ***(64 year old with 49 years experience)***

Another in Ibadan said:
We make them understand that immunization is very important for the baby, right from day one till one year. The baby is eligible for this immunization. We also instruct the new mother to prevent unplanned pregnancy. We implore them to go for family planning, so this will prevent un-catered for children. (*50 year old with 5 years experience)*

Mothers in Zaria were also encouraged to attend postnatal care in the health facilities as noted by a TBA:
We advice them to improve hygiene and take their newborns for postnatal care, we also advice them to feed well so as to establish good lactation and breast feed their newborns for six months ***(33 year old with 9 years experience)***

Mode of delivery in the last one year from available health records

Childbirth can be through spontaneous vaginal delivery (SVD), instrumental or caesarean section. Therefore, a review of the mode of delivery and its outcome is necessary to understand the pattern in Nigeria as it affects mother and child. Table 18 presents the percentage distribution with the mode of delivery. About four out of five deliveries in Nigeria are through spontaneous vaginal delivery (SVD), one percent had instrumental deliveries and the remaining 18% were through caesarean section. This is the pattern observed for all the study locations.

Table 18: Mode of delivery in the last one year from available record

Significant variables	% SVD deliveries	% Instrumental deliveries	% C/S deliveries	*Number of deliveries*
Last one year (Overall)	80.8	1.0	18.2	*14878*
Last one year by study location				
• Enugu	80.2	0.9	18.9	*3085*
• Ibadan	75.4	1.2	23.4	*6627*
• Zaria	88.1	0.9	11.1	*5166*
Last one year by type of facility				
• Public hospital	70.6	2.0	27.4	*6676*
• Primary Health care centre	93.5	0.2	6.4	*5438*
• Private health facility	73.5	0.8	24.8	*514*
• Faith based health facility	81.4	0.1	18.5	*2250*

Furthermore, the Primary Health Center (PHC) has the highest percentage of childbirth delivery through SVD. The number of spontaneous vaginal delivery in the faith-based health facility is, however, higher than public hospital and private health facility. Instrumental deliveries occurred more in public secondary or tertiary hospital than other types of health facility. The result implies that 20 out of 1000 deliveries in public hospitals over the last year were instrumental, whereas this mode of delivery was just used for 1 out of 1000 deliveries in faith-based health facilities. Caesarean section deliveries were also highest in public hospitals in the last one year.

Secondary analysis of the available health records on maternal and child health outcomes by the mode of delivery in the last one year preceding the survey are presented in Tables 19 and 20. The result shows that there are 14 maternal deaths out of 10,000 SVD deliveries, 152 out of 10,000 instrumental deliveries and 52 out of 10,000 C/S deliveries. This implies that instrumental deliveries have the highest risk of maternal deaths in the last one year for the selected health facilities. The few maternal deaths recorded in Enugu occurred during spontaneous vaginal deliveries.

Table 19: Mode of delivery in the last one year by maternal deaths from available record

Significant variables	SVD (maternal deaths)		Instrumental (maternal deaths)		C/S (maternal deaths)	
	%	n	%	n	%	n
Last one year (Overall)	0.14	16	1.52	2	0.52	11
Last one year by study location						
• Enugu	0.11	3	0.00	0	0.00	0
• Ibadan	0.28	11	1.52	2	0.70	9
• Zaria	0.04	2	0.00	0	0.35	2
Last one year by type of facility						
• Public hospital	0.34	16	1.52	2	0.49	9
• Primary Health care centre	0.00	0	0.00	0	0.00	0
• Private health facility	0.00	0	0.00	0	0.00	0
• Faith based health facility	0.14	1	0.00	0	1.34	2

For Zaria, 4 maternal deaths occurred out of 10,000 SVD deliveries and 35 out of 10,000 C/S deliveries. It is observed that the incidence of maternal deaths from instrumental deliveries occurred only in Ibadan, though this method was used in other study locations. The public hospitals have the highest recorded number of maternal deaths from SVD and instrumental deliveries. The faith-based health facilities recorded the highest proportion of maternal deaths during caesarean section.

Table 20: Mode of delivery in the last one year by perinatal deaths

Significant variables	SVD (perinatal deaths)		Instrumental (perinatal deaths)		C/S (perinatal deaths)	
	%	n	%	n	%	n
Last one year (Overall)	3.81	326	17.60	22	4.72	107
Last one year by study location						
• Enugu	4.06	103	0.00	29	6.71	40
• Ibadan	4.38	101	30.65	43	4.00	50
• Zaria	3.29	122	8.82	31	4.06	17
Last one year by type of facility	7.65	233	18.97	22	4.41	80
• Public hospital	1..69	87	0.00	0	6.30	22
• Primary Health care centre	1.78	6	0.00	0	2.97	3
• Private health facility	0.00	0	0.00	0	0.00	0
• Faith based health facility						

An examination of perinatal deaths that occurred in the last one year by mode of delivery reveals a similar pattern with maternal deaths. While there are about 38 and 47 perinatal deaths out of 1000 SVD deliveries and caesarean section respectively, an alarming 176 perinatal deaths occurred from 1000 instrumental deliveries. This places instrumental delivery as high risk for both mother and child. There are about 30% and 19% newborn deaths from instrumental childbirth deliveries in Ibadan and public hospitals respectively.

Causes of maternal and perinatal mortality

Proper documentation of the causes of deaths in the health facility is necessary for reduction in maternal and perinatal mortality in Nigeria. This is because preventive measures can be taken for a known cause of death. Although the information from the available health records was scanty, the analyses of causes of maternal and perinatal mortality in the last one year are presented in Tables 21 and 22. There were no records on causes of maternal deaths from Enugu health facilities. The more common causes of maternal deaths in Ibadan and Zaria included obstructed labour, pre-eclampsia and excessive bleeding. For Zaria, however, deaths from prolonged labour were about 22 percent. It is also noted that eclampsia occurred more in Ibadan than Zaria.

Table 21: Major causes of maternal mortality in the last one year from available record

Causes of maternal mortality	Ibadan		Zaria	
	%	n	%	n
Prolonged labour	8.3	2	21.7	13
Obstructed labour	29.2	7	15.0	9
Excessive bleeding (PPH)	12.5	3	23.3	14
Pre-eclampsia	20.8	5	20.0	12
Eclampsia	12.5	3	1.7	1
Puerperal sepsis	4.2	1	6.7	4
Reaction to blood transfusion	4.2	1	NA	NA
Post surgical complications	NA	NA	NA	NA
Anaemia	4.2	1	3.3	2
TOP	4.2	1	NA	NA
Others (specify)	NA	NA	8.3	5

There was no record from Enugu health facilities.

The most common cause of perinatal mortality in the last one year preceding the survey was still birth; 57%, 72% and 46% in Enugu, Ibadan and Zaria respectively. Neonatal jaundice is another cause of perinatal death that was common to all study locations. Other causes of newborn deaths

recorded in Ibadan and Enugu included prolonged labour, obstructed labour, excessive maternal bleeding, pre-eclampsia and eclampsia in the mother. Neonatal sepsis, severe birth asphyxia, LBW/ prematurity, congenital malformations, severe anaemia and others were recorded as other causes of perinatal deaths in Zaria.

Table 22: Causes of perinatal mortality in the last one year

Causes of perinatal mortality	Enugu		Ibadan		Zaria	
	N	%	N	%	N	%
LBW/Prematurity	NA	NA	NA	NA	20	16.3
Prolonged labour	1	1.8	7	9.7	NA	NA
Obstructed labour	11	19.6	6	8.3	NA	NA
Excessive maternal bleeding (PPH)	3	5.4	1	1.4	NA	NA
Pre-eclampsia (in mother)	7	12.5	3	4.2	NA	NA
Eclampsia (in mother)	1	1.8	2	2.8	NA	NA
Neonatal sepsis	NA	NA	NA	NA	18	14.6
Neonatal jaundice	1	1.8	1	1.4	10	8.1
Severe birth asphyxia	NA	NA	NA	NA	11	8.9
Reaction to blood transfusion (EBT/ straight transfusion)	NA	NA	NA	NA	NA	NA
Post surgical complications	NA	NA	NA	NA	NA	NA
(Severe) Anaemia	NA	NA	NA	NA	1	0.8
Congenital malformation	NA	NA	NA	NA	2	1.6
Still birth	32	57.1	52	72.2	56	45.5
Others	NA	NA	NA	NA	5	4.1

3.7 TECHNICAL AUDIT OF IDENTIFIED FACILITIES IN NIGERIA

This section highlights the technical and personnel needs in selected public and private health facilities in Enugu, Ibadan and Zaria. Using the infrastructure and health facility assessment checklist tool developed by WHO/UNFPA, the assessment includes availability of equipment in the labour/maternity ward, obstetric theatres and baby care unit; drug and supplies available; infrastructure and personnel.

Availability of equipment in the labour/maternity ward

The result from the audit of health facilities' functional equipment in the Labour/Maternity wards is shown in Table 23. The needs are specific to each health facility and study location. While some do not have functional equipment on the wards, others have problems with insufficient equipment. It is observed that there was only one cardiotocograph, which was found in the tertiary hospital in Ibadan.

Table 23: Audit of health facilities' functional equipments in the Labour/Maternity wards

Equipments	ENUGU			IBADAN				ZARIA			
	TF *n=1*	PHC *n=4*	FB *n=1*	TF *n=1*	PHC *n=1*	FB *n=2*	PRV *n=2*	TF *n=1*	PHC *n=4*	FB *n=1*	PRV *n=1*
Fetal stethoscopes	1	4	1	1	1	2	2	1	4	1	1
Delivery forceps	1	4	0	1	1	1	2	1	2	1	1
Cardiotocograph	0	0	0	1	0	0	0	0	0	0	0
Sphigmomanometers	1	4	1	1	1	2	2	1	4	1	1
Resuscitaire	1	1	1	1	0	0	0	1	0	0	1
Suction machines	1	3	1	1	1	1	0	1	3	1	1
Pathrogram	0	0	1	1	1	1	1	1	2	1	1
Radiant warmers	1	0	1	0	0	1	0	1	0	0	1
Ambu bags	1	2	1	1	1	1	0	1	2	1	1
Endotracheal tubes	0	1	0	1	0	0	0	1	0	1	1
Laryngoscopes	0	0	0	1	0	0	0	1	0	1	1
Mucus extractors	1	4	1	1	0	1	2	1	4	1	1
Vacuum extractors	1	2	1	1	0	0	2	1	0	1	1
Infant weighing scales	1	4	1	1	1	2	2	1	4	1	1
Long gloves	0	1	1	1	0	0	2	1	0	0	1

*Note: **TF**- Tertiary Health Facility; **PHC**- Primary Health Care Centre; **PRV**- Private Health Facility; **FB**- Faith Based Health Facility*

The specific needs in the maternity/labour wards in the tertiary hospital in Enugu are cardiotocograph, endotracheal tubes, laryngoscopes and long gloves. All the equipments, but one (radiant warmer), were present and functional in the tertiary hospital in Ibadan. Also in Zaria, the only equipment lacking in the labour/maternity ward of the tertiary hospital is the cardiotocograph. In the primary health care centres of all the study locations, there is no evidence of functional and sufficient carditocographs, radiant warmers, resuscitaire and laryngoscopes in the labour wards. Other needs of Enugu and Ibadan PHC are partograms, endotracheal tubes and long gloves. The PHC in Ibadan would also need mucus and vacuum extractors. There is a need for vacuum extractors and long gloves in Zaria PHC. The needs of faith-based health facilities in Enugu and Ibadan include

endotracheal tubes and laryngoscopes among others while three equipments are needed in the maternity wards of Zaria faith-based hospitals. The three equipments are cardiotocography, radiant warmers and long gloves. Unlike the private hospitals in Ibadan, the Zaria private hospitals have almost all the equipment required for the labour ward.

Availability of equipment in the Obstetric theatre

Table 24 presents the audit of health facilities with functional equipment in the Obstetric theatres. It is remarkable that nine out of ten equipments in the obstetric theatre of tertiary hospitals in Ibadan and Zaria are functional. Radiant heaters and mucus extractors are needed in UCH Ibadan and ABTH Zaria respectively. It is observed that only six out of ten equipments are functional in Enugu UNTH.

Table 24: Audit of health facilities' functional equipment in the Obstetric theatre

Equipment	ENUGU			IBADAN				ZARIA			
	TF *n=1*	PHC *n=4*	FB *n=1*	TF *n=1*	PHC *n=1*	FB *n=2*	PRV *n=2*	TF *n=1*	PHC *n=4*	FB *n=1*	PRV *n=1*
Anaesthetic system	1	0	1	1	0	1	0	1	0	1	1
Mucus extractor	0	2	1	1	0	0	1	0	4	1	1
Infant laryngoscopes	1	1	1	1	0	1	0	1	0	1	1
Infant endotracheal tubes	0	1	1	1	0	1	0	1	0	1	1
Suction machines	1	3	1	1	0	1	1	1	2	1	1
Fetal stethoscopes	0	3	1	1	0	1	1	1	4	1	1
Ambu bags	1	1	1	1	0	1	1	1	2	1	1
Resuscitaire	1	0	1	1	0	0	0	1	0	0	1
Radiant heaters	0	0	1	0	0	1	0	1	0	0	1
Infant weighing scales	1	3	0	1	0	0	1	1	3	1	1

*Note: **TF**- Tertiary Health Facility; **PHC**- Primary Health Care Centre; **PRV**- Private Health Facility; **FB**- Faith Based Health Facility*

There was no record of available equipment in the obstetric theatres at the Ibadan primary health care centres. While some were available and functional in Enugu and Zaria PHC, anaesthetic systems, resuscitaire and radiant heaters are still needed. With slight variation in Ibadan, faith-based health facilities have almost all the equipment needed in the obstetric theatres. It is impressive that private hospitals in Zaria have all the equipment necessary for a functional obstetric theatre. Generally, there is a need for radiant heaters and resuscitaire in most of the health facilities.

Availability of equipment in the Baby Care Units

The presence of a baby care unit in the health facilities is necessary for the care of the ill or premature newborn. The number of functional equipment in this unit for Enugu, Ibadan and Zaria are shown in Table 25. There was no record of baby care units in PHCs Enugu and private hospitals in Zaria. While blood gas analysers were not available in most of the health facilities, a single radiant heater was recorded to be available in a faith-based hospital in Ibadan. The needs of this unit in Enugu UNTH include room heaters and cutdown packs. Resuscitaires, oxygen concentrators, bilirubinometers and cutdown packs are currently not available in the baby care unit of UCH Ibadan. Zaria ABTH's needs include infusion pumps and Bilirubinometers to complete the unit.

Table 25: Audit of health facilities' functional equipment in the Baby care units

Equipments	ENUGU			IBADAN				ZARIA			
	TF *n=1*	PHC *n=4*	FB *n=1*	TF *n=1*	PHC *n=1*	FB *n=2*	PRV *n=2*	TF *n=1*	PHC *n=3*	FB *n=1*	PRV *n=1*
Incubators	1	0	1	1	1	0	1	1	0	1	0
Phototherapy unit	1	0	1	1	0	1	0	1	0	1	0
Room heaters	0	0	1	1	0	0	0	1	0	1	0
Resuscitaire	1	0	0	0	0	0	0	1	0	0	0
Suction machines	1	0	1	1	0	0	0	1	1	1	0
Pulse oximeter	1	0	0	1	0	1	0	1	0	0	0
Infant ventilators	1	0	1	1	0	0	0	1	0	0	0
Ambu bags	1	0	1	1	0	0	0	1	2	1	0
Laryngoscopes	1	0	0	1	0	1	0	1	0	1	0
Endotracheal tubes	1	0	0	1	0	0	0	1	0	1	0
Infusion pumps	1	0	1	1	0	0	0	0	0	0	0
Oxygen concentrators	1	0	1	0	0	0	1	0	0	0	0
Blood gas analyser	0	0	0	0	0	1	0	0	0	0	0
Radiant heater	0	0	1	1	0	0	0	1	0	0	0
Glucometer	1	0	0	1	0	0	2	1	0	1	0
Bilirubinometer	1	0	0	0	0	0	1	0	0	0	0
Cut down pack	0	0	0	0	0	0	1	1	0	1	0

*Note: **TF**- Tertiary Health Facility; **PHC**- Primary Health Care Centre; **PRV**- Private Health Facility; **FB**- Faith Based Health Facility*

Resuscitaires and Bilrubinometers are not available in all the faith-based hospitals. Although each of the faith-based hospitals in Enugu and Zaria has only nine out of 17 equipments necessary for the baby care units, their counterparts in Ibadan have just four functional equipments for the same unit. The private hospital in Ibadan is the only facility that has a baby care unit with functional incubators, oxygen concentrators, glucometers, bilirubinometers and cut down packs.

Availability of drugs and supplies in the health facilities

The audit of drugs and supplies in the selected health facilities is shown in Table 26. Apart from UCH Ibadan and ABTH Zaria, piped oxygen supply and morphine are not available in all the health facilities.

Table 26: Audit of health facilities' drugs and supplies

Equipments	ENUGU			IBADAN				ZARIA			
	TF *n=1*	**PHC** *n=4*	**FB** *n=1*	**TF** *n=1*	**PHC** *n=1*	**FB** *n=2*	**PRV** *n=2*	**TF** *n=1*	**PHC** *n=4*	**FB** *n=1*	**PRV** *n=1*
Piped oxygen supply	0	0	0	1	0	0	0	1	0	0	0
Pethidine	1	0	1	1	0	0	0	1	0	0	1
Morphine	0	0	0	1	0	0	0	1	0	0	0
Magnesium sulphate	1	0	1	1	0	1	1	1	0	1	1
Diazepam	1	3	1	1	1	1	2	1	3	1	1
Paraldehyde	1	1	1	0	0	1	0	1	2	1	1
Phenobarbitone	1	1	1	1	0	1	1	1	3	1	1
Hydrocortisione	1	2	1	1	1	1	2	1	2	1	1
Manitol	1	0	1	1	0	1	1	1	0	1	1
Dexamethasone	1	0	1	1	0	1	2	1	0	1	0
Largactil	1	1	1	1	0	1	2	1	0	1	0
Bethamethazone	0	0	0	0	0	0	1	1	0	1	0
Hydralazine	1	2	1	0	0	1	1	1	0	1	1
Diaxoxide	1	1	1	1	0	1	1	1	2	1	1
Nifedipine	0	3	0	0	1	1	2	0	3	1	1
Infant weighing scales	1	3	1	1	0	1	2	1	4	1	1
Quinine	1	3	1	1	1	1	2	1	4	1	1
Ampiclox	0	3	0	1	1	1	1	1	2	1	1
SP	0	3	0	1	1	1	1	1	3	1	1
Gentamycin	1	4	1	1	1	1	2	1	4	1	1
Ceftriaxone	1	1	1	1	1	1	1	1	0	1	1
Cloxacillin	0	0	0	1	1	0	0	0	0	0	1
E B T packs	1	1	0	0	0	0	1	0	0	0	1
Penicillin	1	2	1	0	0	0	1	1	3	0	1
Cefuroxime	1	2	1	1	0	1	0	1	2	1	1
Paediatric saline	1	1	1	1	0	1	1	1	2	1	1
Half Darrows infusion	1	3	1	1	0	0	1	1	3	1	1
10% /50% Dextrose	0	4	1	1	0	1	2	1	3	1	0
Chloramph eye ointment	1	3	1	1	1	1	1	1	4	1	1
Augmentin	1	2	1	1	1	1	1	1	1	1	1
Ceftazidime	1	0	1	1	0	1	0	1	2	1	0
Ergometrine	1	4	1	1	1	1	2	1	4	1	0

*Note: **TF**- Tertiary Health Facility; **PHC**- Primary Health Care Centre; **PRV**- Private Health Facility; **FB**- Faith Based Health Facility*

Adequate and functional infrastructure in the health facilities

The presence of most of the needed infrastructure in the tertiary hospitals is remarkable in Enugu, Ibadan and Zaria (Table 27). However, breastfeeding and mothers' rooms are not available in Enugu and Ibadan. There are no separate baby care units, blood bank, internet facilities and conference rooms in any of the primary health care facilities. Running tap water was not available in Enugu PHC at the time of the study, and this can affect the hygiene of the health facility. Laboratories, incinerators and sleeping-rooms for doctors are also not available at the primary health care centres in Ibadan. For Zaria PHC, there is a need for essential infrastructure such as a separate baby care unit, incinerator and intercom. Faith-based health facilities in Enugu and Zaria do not have separate obstetric theatres. Ibadan FB health facility only needs an incinerator and sleeping rooms for the doctors.

Table 27: Number of health facilities with adequate and functional infrastructure

Equipments	ENUGU			IBADAN				ZARIA			
	TF *n=1*	PHC *n=4*	FB *n=1*	TF *n=1*	PHC *n=1*	FB *n=2*	PRV *n=2*	TF *n=1*	PHC *n=4*	FB *n=1*	PRV *n=1*
Separate obstetric theatre	1	3	0	1	0	1	1	1	1	0	0
Separate baby care unit	1	0	1	1	0	1	0	1	0	0	0
Laboratory	1	3	1	1	0	1	2	1	3	1	1
Blood bank	1	0	1	1	0	1	0	1	0	0	0
Power Generators	1	2	1	1	1	2	2	1	2	1	1
Incinerator	1	2	1	1	0	0	0	1	0	0	0
Intercom	1	1	1	1	1	1	2	1	0	1	1
Running water taps	1	0	1	1	1	1	2	1	1	1	0
Clean patients' toilets	1	4	1	1	1	1	2	1	4	1	1
Pharmacy/dispensary	1	4	1	1	1	1	2	1	3	1	1
Sleeping – in rooms for doctors	1	1	1	1	0	0	1	1	0	1	1
Generally clean environment	1	4	1	1	1	1	2	1	4	1	1
Offices for doctors & nurses	1	4	1	1	1	1	2	1	4	1	1
Breastfeeding room	0	0	0	0	0	0	0	0	0	0	0
Mothers' room	0	1	0	0	0	0	1	1	0	0	0
Adequate & safe car park	1	1	1	1	1	2	0	1	4	1	1
Internet facilities	1	0	1	1	0	0	0	1	0	0	0
Conference room	1	0	1	1	0	1	0	1	0	1	0
Security outfit	1	1	1	1	1	2	2	1	3	1	1

*Note: **TF**- Tertiary Health Facility; **PHC**- Primary Health Care Centre; **PRV**- Private Health Facility; **FB**- Faith Based Health Facility*

Personnel and training

There is paucity of information on personnel in some of the selected health facilities as observed in Table 28. While some of the doctors in the Enugu tertiary hospital had been trained with ELS for obstetric and neonatal care, the record shows that only a few nurses in the baby care unit received ELS training. Nurses and midwives in the primary health care centre in Enugu have also received ELS training. This pattern is similar in Zaria tertiary hospital ELSS.

Table 28: Number of personnel in the health facilities

Personnel issues	ENUGU			IBADAN				ZARIA			
	TF *n=1*	PHC *n=4*	FB *n=1*	TF *n=1*	PHC *n=1*	FB *n=2*	PRV *n=2*	TF *n=1*	PHC *n=3*	FB *n=1*	PRV *n=1*
Doctors for Obstetric care	19	0	6	NA	NA	1	NA	60	0	0	1
Doctors for Neonatal care	4	0	5	NA	NA	1	NA	11	0	0	1
Doctors with ELS training for Obstetric care	9	0	2	NA	NA	1	NA	26	0	0	1
Doctors with ELS training for Neonatal care	4	0	1	NA	NA	1	NA	9	0	0	0
Consultant doctors for Obstetri care	4	0	NA	NA	NA	2	NA	13	0	0	0
Consultant doctors for Neonatal care	4	0	1	NA	NA	0	NA	3	0	0	0
Nurses in maternity ward	90	21	5	NA	2	8	5	19	11	6	10
Nurses in maternity ward per shift	12	12	2	NA	2	5	NA	3	3	2	4
Nurses in labour ward	19	19	5	NA	2	2	NA	NA	7	6	0
Midwives in labour ward	19	17		NA	NA	5	NA	19	6	6	10
Nurses in labour ward per shift	3	11	2	NA	2	0	3		4	2	0
Midwives in labour ward per shift	3	9	2	NA	2	0	4	3	4	2	4
Nurses with ELS training	0	1	0	NA	NA	0	NA	NA	0	0	0
Midwives with ELS training	0	2	0	NA	NA	0	2	5	1	0	1
Nurses in baby daycare unit	21	0	8	26	NA	0	3	NA	NA	NA	NA
Midwives in baby daycare unit	21	0	2	NA	NA	0	2	19	NA	NA	NA
Baby care unit nurses with ELSS training	7	0	1	10	NA	0		15	NA	NA	NA
Paediatrician	23	0	1	NA	NA	0	2	17	NA	NA	NA

3.8 BARRIERS TO OPTIMAL PROVISION OF CARE

Accessing health care facility for ANC and childbirth

Information on factors that can affect access to health care facilities for ANC and childbirth is very significant for this study. Table 29 summarizes the cost of ANC registration and transportation. From the community survey, women claimed that they spent an average of 1645 and 332 Naira on

ANC registration and transportation respectively. The result of the exit interviews is not the same as that of the community survey. The cost of registering for ANC in public health facilities is as low as 539 in Zaria and as high as 4570 in Ibadan.

Table 29: Cost of accessing health care facility for ANC by pregnant women

Significant characteristics	**ANC registration Cost (₦)**		**ANC Transportation Cost (₦)**	
	Mean	*CI*	*Mean*	*CI*
ALL women *(Last or current pregnancy)*	1645	1489 – 1801	332	292 – 372
• Enugu • Ibadan • Zaria	1962 1499 1410	1649 – 2276 1286 – 1712 1164 – 1658	177 457 395	152 – 201 343 – 571 347 - 442
Current ANC at Public HF	2567	2281- 2854	172	160 – 185
• Enugu • Ibadan • Zaria	1478 4570 539	1314 – 1642 3974 – 5165 487 – 589	169 186 153	146 - 193 186 - 207 133 – 173
Current ANC at Private HF	2555	2468 – 2641	149	138 – 159
• Enugu • Ibadan • Zaria	2970 1938 3045	2852 – 3088 1809 – 2067 2897 – 3196	152 161 101	135- 168 143 – 179 95 – 107

Except for Ibadan study location, the cost of ANC in the private hospitals is higher than public hospitals. Irrespective of the type of hospital, cost of transportation is above 100 naira. This led to the question: "How do you cope with the payment of ANC services?" The women in this study identified several coping methods for payment of ANC services as shown in Table 30. While the majority of the respondents claimed that they used either their own or hubands' money for the ANC services, only six percent of all women in the community survey were exempted from payment or have free ANC service provided by the government. The use of health insurance for ANC services is still quite uncommon in Nigeria; however, more pregnant women use the health insurance for ANC in public health facilities than private health facilities. Very few women will sell their assets or land to attend antenatal care in any health facility.

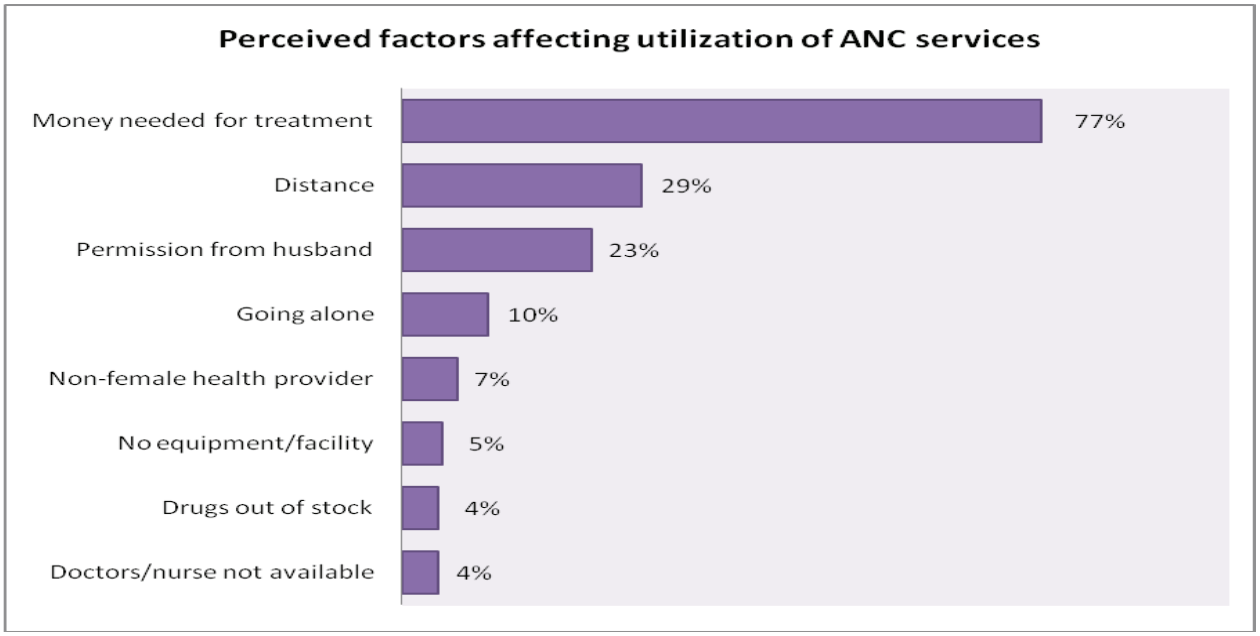
Table 30: Coping method for payment of ANC services

Coping method for payment	ALL women *(Last or current pregnancy)* n= (%)	Current ANC at Public HF n=944 (%)	Current ANC at Private HF n=829 (%)
Coping method for ANC payment			
• Out of pocket- Self or Husband	91.8	93.7	98.1
• Loan/ Borrowed money	2.9	2.3	1.8
• Sold assets or land	0.2	0.1	0.1
• Community solidarity/someone else	2.2	1.3	2.6
• Exemption from payment/free service	6.3	2.3	1.2
• Health insurance	1.0	7.8	1.5

Perceived factors affecting utilization of ANC services at health facility

Perceived factors that affect the use of ANC services is significant to the needs' assessment of maternal and perinatal mortality in Nigeria. Information on these perceived factors, which could be personal or facility related, would provide a basis for intervention on the barriers to ANC services. Figure 11 and Table 31 present responses from the women on perceived problem in accessing ANC services. The money that is needed for treatment is the most important factor identified by more than two-thirds of women in this study. About one out of five mentioned getting permission from their husbands to attend the clinic (personal), and the long distance of the health facility (facility related) as problems they encountered. Other personal problems include going to the facility alone and non-availability of female health providers in the health facility. Facility-related problems also mentioned are non-availability of functional equipment in the facility; drugs are out of stock and non-availability of the skilled health providers such as doctors and nurses.

Figure 11: Perceived factors affecting utilization of ANC services



The breakdown of these perceived factors by the study locations shows that financial constraints are still the dominant reason for not accessing ANC services in the health facilities. In Enugu and Ibadan, another pertinent factor is distance of the health facility; one out of five women mentioned this factor as affecting their utilization of ANC services in the health facilities. However, in Zaria, a significant proportion mentioned some personal problems that are embedded in the prevalent culture of northern Nigeria. Permission required from the husband is an important perceived factor in Zaria; at least, three out of five women had problems with getting permission from their husbands to attend the antenatal clinics. The long distance of the health facility to their homes is a facility-related problem that is also commonly mentioned in Zaria; more than half of the women said that the health facility was too far from their homes.

Table 31: Perceived factors affecting accessibility of ANC services

Factors	Enugu n=646 **(%)**	Ibadan n=786 **(%)**	Zaria n=303 **(%)**
• Money needed for treatment	94.9	63.9	74.2
• Permission from husband	10.9	17.2	65.3
• Distance	24.5	21.9	58.0
• Going alone	1.7	10.1	29.0
• Non-female health provider	0.8	7.5	18.2
• Doctors/nurse not available	1.1	7.0	4.9
• Drugs out of stock	0.3	7.0	6.7
• No equipment/facility	1.5	7.2	6.3

CHAPTER 4

CONCLUSION AND RECOMMENDATIONS

4.1 CONCLUSION

- This study assessed the state of health services viz a viz maternal and perinatal mortality in some selected regions of Nigeria. Consequently, it offers insight into existing opportunities for intervention. Specific objectives include documenting the pattern of utilization of formal and informal health facilities for maternal and perinatal care; conducting a technical audit of identified facilities, equipment and personnel and organizational audit of the process of maternal and perinatal cares at various levels, and identifying barriers to the best provision of care.

- This study has clearly shown that although many women used the formal health facilities, their knowledge of child birth complications is still low. Promoting this knowledge cannot be over stressed since it can trigger timely treatment and referral. Although most of the women in all the locations attended for ANC as recommended (four or more ANC visits), significant numbers had their first ANC visit during the 4th or 5th month. This is contrary to the recommendation given by World Health Organization (WHO) in 2010 that the first ANC visit should be between the 3rd and 4th month of pregnancy. This implies that the low knowledge of pregnancy complications may have caused the delay in timing of first visit. Further research needs to be carried out on this to explore reasons why there is a delay in ANC timing of first visit.

- It is observed that probably due to the few number of health personnel in some parts of the study locations, some women waited for more than one hour before they were attended to. This, in conjunction with the high cost of ANC services and proximity, may have contributed to significant home delivery in all the study locations. More studies have to be conducted to find out why people still deliver at home. In addition, there is no doubt that adequate facilities are needed in the labour wards if MDGs goals number four and five will be achieved. This is because some basic equipment such as the cardiotocograph, radiant warmers, resuscitaire and laryngoscopes are lacking in nearly all the study locations and health centres. There is also a need to enlighten the women on the importance of ANC and PNC clinics; this will help in preventing/reducing infant and maternal mortality.

4.2 RECOMMENDATIONS

A multidimensional approach is needed to address maternal and perinatal mortality in Nigeria. This includes individual and structural contributions as highlighted below:

- The money that is needed for treatment is the most important factor identified by more than two-thirds of women in this study. Many women are not able to, afford the cost of visiting the health care centers, have a trained birth attendant present at delivery, have at least one prenatal care, and are least likely to be fully immunized. Therefore, the government needs to fully integrate the national health insurance scheme to address financial challenges, which serves as a hindrance to the use of ANC services. Not only should government aim at full coverage of NHIS, efforts should also be directed towards ensuring that the scheme covers the needed drugs and treatment needed for ANC services. This can be done by subsiding some of these ANC drugs and treatment. Health insurance for ANC services in Nigeria should be properly managed, and women should be encouraged to use health insurance for ANC services.

- Coverage rates for all known cost effective interventions should be increased by the government and stakeholders so that infants and mothers' lives could be saved. Maternal mortality rates would be drastically lowered if cost-effective intervention programs for maternal and infant health care are increased. This will help in addressing most of the identified pregnancy problems by women who gave birth in the last one year or are pregnant during the time of the survey in all the study locations. There is a need for the introduction of Community Based Health Insurance schemes; which should be community driven and coordinated by the NHIS as a (P-P-P initiative) – Public, Private People initiative, with a focus on Maternal and Child Health Care

- It is important to increase awareness of the link between cultural values and health seeking behaviour since it is observed that culture featured prominently in utilization of ANC services most especially in the Northern part (Zaria) of the country. From literature, most of the information on the use of ANC services targets women; there is a need for male-focused interventions that will educate them on the importance of ANC visits. The findings show that about two out of ten (23%) women in the study locations and more than half the women (58%) in Zaria did not attend ANC visits because their husbands did not permit them.

- Promotion of knowledge of child birth and newborn complications among the deprived populations (unemployed, uneducated and youths aged between 15-24 years) should be encouraged. Women need to be encouraged to adhere to the antenatal and delivery precautions. The importance of education cannot be overemphasized; the findings showed that women with tertiary education and in paid employment have significantly higher knowledge of pregnancy and childbirth-related problems while women with at least secondary school education had more ANC visits than others. Gender gaps in education should be reduced in Nigeria as this will boost gains towards meeting the health MDGs since better educated women are more likely to raise healthy children and seek out health care when needed. It is also important to note that some of the cultural interplay in access of women to health care services can greatly

be neutralized by the education of the couple.

- As most women perceive that the best place to attend antenatal care is the PHC or health post, but delivery should be in the public hospitals, greater access to basic prenatal and emergency obstetric care at the primary level would have a great impact. In areas where these facilities are present, there should be an expansion of facilities for prenatal and postnatal care to reduce the long delays women experience before being attended to and for a faster response in the event of emergencies.

- The finding that about 92% of women had at least four ANC visits before delivery is positively significant and in accordance with the WHO (2010) recommendations. The hospital records support the finding that a high number of people attend ANC at the health facilities, but the low number of delivery at these facilities creates a basis for further investigation into why women go for ANC but do not deliver in the hospitals?

- As observed in this study, irrespective of the type of health facility used for ANC, the person who conducts the antenatal clinic is very important hence the need to increase the number of skilled health professionals in the health facilities. Professionals with appropriate training can help develop efficient monitoring systems and emphasize health education, public information, health promotion, disease prevention, and social marketing of public health issues. This is more applicable in the Public Health Care Centres where women have claimed that access to doctors was relatively lower than in private hospitals.

- There is an expedient need for training and re-training of TBAs on ante and post natal care of patients. All the TBAs in Zaria claimed that though ANC is important, they have not been trained for antenatal care.

- There is need for reliable and subsidized emergency transportation. Women with complicated deliveries often require obstetric care, which is unavailable at their local health facilities. On the other hand, emergency transportation to district hospitals can be unreliable and expensive. About one out of five women interviewed mentioned the long distance to the health facility and cost of registering for ANC in public health as barriers to access of health care.

- Since more deaths occur from premature births, then fully functional baby care units in the relevant health facilities is necessary for the care of the ill or premature newborn. The hospital in Ibadan is the only place that indicated the presence of baby unit with complete and fully functional equipment.

- Though the needs are specific to each health facility and study location; some facilities do not have functional equipments in the wards while others have problems with insufficient equipment. It is therefore important to procure new facilities as well as upgrade facilities of various health care centers. This is particularly necessary for the public hospitals, which has the highest recorded number of maternal deaths from SVD and instrumental deliveries.

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