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DETERMINANTS OF URBAN-RURAL DIFFERENTIALS IN ANTENATAL CARE UTILIZATION IN NIGERIA

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RESEARCH REPORT SUBMITTED TO THE FACULTY OF HUMANITIES,
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ACADEMIC YEAR, 2012

DECLARATION

I, Babalola Blessing, declare that this research report is my original work. It is being submitted in fulfilment of the requirements for the award of the degree of Masters in Demography and Population Studies of the University of the Witwatersrand. This work has never been submitted for the award of any degree in this university or another, to the best of my knowledge.

……

…….. day of ……., 2013.

DEDICATION

I dedicate this research report to the Almighty God and my supportive family: Joel, Justina, Tunde, Seyi and Tosin Babalola.

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Firstly, I appreciate God Almighty, the Creator of the Heavens and the earth, as well as everything therein, for giving me the opportunity to begin and end this research successfully on time.

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LIST OF ABBREVIATIONS

ANC	**Antenatal Care**
BDHS	**Bangladesh Demographic and Health Survey**
NDHS	**Nigeria Demographic and Health Survey**
WHO	**World Health Organization**
DHS	**Demographic and Health Survey**
NPC	**National Population Commission**
UNICEF	**United Nations Children's Fund**
USAID	**United States Agency for International Development**

ABSTRACT

Demographic and public health studies have indicated urban-rural differences in the utilization of antenatal care services. However, factors accounting for the urban-rural differentials in Antenatal Care use are unknown. The study used the 2008 Nigeria Demographic and Health Survey (NDHS) to examine the background factors associated with the urban-rural differences in antenatal care utilization in Nigeria. Findings revealed a strong urban-rural differential in antenatal care utilization. The logistic regression analysis revealed that age, region, women education, religion, distance to health facility, partner's education, employment status and wealth status were the significant determinants of antenatal care use in the rural areas of Nigeria. For urban women, age, region, women education, distance to health facility, partner's education, living children and wealth status were the significant determinants of antenatal care use. In the total model, all the background variables except marital status were significantly associated with antenatal care use. The determinants of urban-rural differentials of antenatal care utilization in Nigeria are religion, occupation and number of living children, as religion and occupation were significantly associated with ANC use in the rural area only, while the number of living children was associated with ANC use in the urban areas only. Non-Catholic Christian and Muslim women were 1.32 and 1.28 times respectively more likely to use antenatal care than their Catholic counterparts. Employed rural women were 1.22 times more likely to use antenatal care than unemployed rural women. Urban women who had 1-2 and 3-4 living children were 2.97 and 2.76 times respectively more likely to use ANC compared to urban women without any living children. However, programmes and policies targeted at improving ANC use in the rural areas of Nigeria should involve religious institutions and promote women employment in the rural areas of Nigeria.

CHAPTER 1

INTRODUCTION

1.1. Background:

Studies in sub-Saharan African countries have revealed urban-rural differential in the pattern of antenatal care use (Ibnouf et al., 2007; Rahman et al., 2008). In 2008, a large urban-rural differential in antenatal care utilization was revealed in sub-Saharan Africa, which indicated that about 66% of rural women use antenatal care at least once, compared to 89% of urban women who use antenatal care in sub-Saharan Africa (United Nations, 2010). In Bangladesh, urban women use antenatal care more than their rural counterparts (Fosto et al., 2008). Similarly, this trend was established in Nigeria, as more use of antenatal care was experienced in the urban areas than the rural areas (Dairo and Owoyokun, 2010). The Nigeria Demographic and Health Survey report revealed that about 83.4% of the urban women received antenatal care from skilled birth attendants, compared to 46.4% of the rural women who received antenatal care from skilled birth attendants (NPC and ICF Macro, 2008).

It is important to examine the urban-rural differential in antenatal care utilization in a highly populated country like Nigeria, as a high population poses challenges to healthcare service delivery (NPC and ICF Macro, 2008). In addition, it is assumed that the urban-rural disparity experienced in health service provision in Nigeria is due to the misdirection of funds from the Federal Ministry of Health to the urban areas, where about 30% of the population reside, instead of the rural areas. Consequently, a serious health need has been created in the rural areas. More so, Nigeria is currently experiencing a dynamic shift of people from the rural areas to the urban areas. A study revealed a 9% increase in the percentage of women of age 15-49 who were

residing in the urban parts of Nigeria between 1990 and 2003 (Bankole et al., 2009). One would expect that moving to the urban areas should improve the health service utilization of pregnant women in the urban areas, due to the better health services available in the urban settlements, when compared to the rural settlements of Nigeria (Dairo and Owoyokun, 2010). We would also expect this to improve maternal and neonatal outcomes in Nigeria (Bankole et al., 2009). However, contrary to expectations, increased urban population in Nigeria poses a challenge on the maternal health facilities as these health facilities became insufficient for the growing population (Helen, 1991).

1.2. Statement of the problem

Poor use of antenatal care is mostly experienced in Africa and Asia's less developed countries (Zanconato et al., 2006). Nigeria, being one of the African continent's less developed countries, also experiences very low use of antenatal care. The Nigeria Demographic and Health Survey (NDHS) of 2008 revealed that 36% of women in the country did not receive antenatal care for their last delivery that took place five years prior to the 2008 survey (NPC and ICF Macro, 2009). Thus, pregnancy complications that led to maternal and child mortality is predominant among women who did not receive antenatal care at pregnancy (Wall, 1998; Ujah, 2005). This is because these women failed to receive the antenatal care that could have ensured that diseases are detected early during pregnancy and treatments provided on time through the provision of preventive services such as tetanus immunization, regular check of weight and blood pressure, preventive treatment of malaria and testing and counselling on HIV, which consequently reduce the risk of maternal and child mortality (Babalola and Fatusi, 2009; Adams et al., 2005; NPC and ICF Macro, 2009; WHO and UNICEF, 2003).

However, due to its high prevalence globally, the reduction of maternal mortality has been a worldwide goal. The Millennium Development Goals' poverty alleviation objective targeted bringing down the worldwide ratio of maternal death by 75% by 2015 from what it was in 1990 (WHO 1996). In addition, the introduction of the safe motherhood initiative in Kenya in 1987, which was targeted at reducing maternal mortality, has facilitated advances in medical and technical research on the biomedical causes of maternal mortality in childbirth. It has advanced ways of measuring maternal mortality and gathered sufficient evidence as regards the best health services needed to reduce maternal death (Khan et al., 2006; Graham, 2002 and Fortney, 2005). Unfortunately, Nigeria has not made much significant achievement nationally to reduce maternal mortality because of low political support for maternal healthcare services, including safe motherhood initiative, and inadequate as well as unequal distribution of financial resources to safe motherhood initiative in Nigeria (Shiffman and Okonofua, 2007).

Antenatal care use is also a major means of reducing maternal and child mortality in Nigeria since it provides opportunity for early detection of complications at pregnancy (Babalola and Fatusi, 2009). However, access to and the use of antenatal healthcare services, which could have improved maternal and neonatal health outcomes, remain low in Nigeria (Adams et al., 2005; Babalola and Fatusi, 2009). It was revealed that about 58% of women attended at least one antenatal clinic during pregnancy in Nigeria (NPC and ICF Macro, 2009). This report shows the pathetic state of things in Nigeria with regards to mitigating the problem of high maternal and child mortality through antenatal care use and other possible methods.

As Nigeria experiences increased population growth and urbanization, access to the maternal healthcare facilities available in the urban areas becomes more competitive and this creates a health need in the urban settlements (Helen, 1991). In addition, misappropriation of funds

allocated to healthcare in the urban areas at the expense of the rural areas creates a major urban-rural disparity in healthcare delivery to the detriment of the rural areas, which have a higher population (Marcellyn and Babatunji, 2012).

In addition, a few studies done on antenatal care in Nigeria have helped to identify the fact that there is a rural-urban difference in the use of antenatal care (Dairo and Owoyokun, 2010; Babalola and Fatusi, 2009). These studies revealed that urban residents are more likely to use antenatal care compared to the rural residents. However, they failed to examine the factors that are associated with this difference in the pattern of antenatal care usage between rural and urban dwellers (Babalola and Fatusi, 2009). Therefore, this study seeks to give a representative finding to the determinants of urban-rural differentials of antenatal care utilization in Nigeria and also give recommendations to ensure an improvement in antenatal care use in Nigeria.

However, high maternal and child mortality, as a result of poor antenatal care use, has been a major public health concern in Nigeria (Adams et al., 2005). Urban rural differential in the use of antenatal care remain skewed against the rural residents in Nigeria (Dairo and Owoyokun, 2010). Also, determinants of urban-rural differentials in the use of antenatal care in Nigeria have not been established in previous studies. This issue has created sufficient problems, which would be tackled in this study and in subsequent studies. Therefore, this study would use the Nigeria Demographic and Health Survey (NDHS) to examine the socio-economic, demographic and cultural factors that are associated with the urban-rural differences in antenatal care utilization in Nigeria.

1.3. Research question

What are the determinants of urban-rural differentials in Antenatal Care Utilization in Nigeria?

1.4. Objectives

1.4.1 General objective

To identify the determinants of urban-rural differentials of antenatal care use in Nigeria.

1.4.2. Specific objectives

1 .To describe the distribution of antenatal care utilization among the rural and urban women in Nigeria.

2. To determine the factors associated with urban-rural differential in Antenatal Care (ANC) use.

1.5. Justification/ rationale

Previous studies done on the determinants of maternal health services in Nigeria had not been nationally representative as they concentrated on small communities, usually small-sized urban communities and or rural communities (Okafor, 1991; Nwakoby, 1994; Osubor et al., 2006). For instance, two recent studies were conducted in Nigeria on antenatal care. The first study examined the significant determinants of antenatal care service use in Nigeria but only focused on Ibadan (Dairo and Owoyokun, 2010). Another recent study done in Nigeria, which examined the patterns of maternal health services, was conducted in Sagamu, a small city in Ogun State in South Western Nigeria (Iyaniwura and Yusuf, 2009). Thus, the use of small geographic samples in previous studies limits the applicability of such findings in a large and socially changing society like Nigeria (William and Diane, 1997). Nigeria is currently estimated to be over 170

million people and ranks the most populated country in Africa (CIA, 2012). In view of this, studies that could be recognized for policy recommendations in such a large country have to be nationally representative. Consequently, findings from this study would add to the body of knowledge as a nationally representative study on the determinants of antenatal care service utilization

It should be noted that, examining the factors that determine the rural urban differences in the pattern of antenatal care utilization can assist public health decision makers to make informed decisions as regards the kind of intervention programs that will encourage women to seek antenatal care. For instance, embarking on intervention programmes that make antenatal care services more accessible and affordable to rural women and members of their families may reduce the differences in the pattern of antenatal care use between urban and rural women, and also positively influence other factors associated with the rural-urban differentials in the use of antenatal care (McCarthy and Maine, 1992; Palaniappan 1995).

This study used the chi-square test and multiple regressions as its method of analysis. Chi-square test was appropriate for this study to reveal the urban-rural distribution of the background variables of this study as they relate with the outcome variable because it agrees with the chi-square assumption that the variables to be tested for relationship must be categorical, and all the variables of this study are categorical. The binary logistic regression was used to determine the determinants of urban-rural differentials of antenatal care utilization because the dependent variable (antenatal care) was re-categorized as binary.

1.6. Definition of concepts

- Antenatal Care: It is the medical care that women received during pregnancy. The World Health Organization advocated an improved model for antenatal care use for women without complicated pregnancy in developing countries. This model recommends at least four antenatal care visits, which would include compulsory blood pressure measurement, urine and blood tests and non-compulsory weight and height check at each visit (WHO and UNICEF, 2003; NPC and ICF Macro, 2009).
- Maternal mortality: this is defined as the death that occurs to women during or 42 days after pregnancy termination. Notwithstanding the duration of the pregnancy, the death must be caused or aggravated by the pregnancy and not by accidental or incidental cause (WHO 2013).

1.7. Outline of the study

This study begins with the summary of the study, followed by a brief introduction to the contextual background that informed the study. Chapter One, the introductory chapter presents the statement of problem, justification of the study, research question, the definition of terms and the outline of the study. Chapter Two contains the review of relevant literatures and the theoretical framework adapted for this study. In Chapter Three, the methodology used to achieve the objective is explained in detail. The data source, sampling design, variables, data management and analysis, and ethical considerations of this study are explained in the methodology section. The result sections, which consist of Chapters four and five, reveal the univariate, bivariate and multivariate findings of this study. In Chapter Six, the study's findings, conclusions and recommendations are presented.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Literature review

Studies have been done in developing countries that showed the differences in antenatal care utilization between rural and urban residents. Majority of the studies revealed more utilization of antenatal care use among urban women than rural women. For example, a study was conducted by Rahman et al. (2008) in Bangladesh. The study looked at the rural-urban differentials of utilization of antenatal health-care services in Bangladesh. Data from the Bangladesh Demographic and Health Survey (BDHS) 2004 was used to examine the factors that are significantly associated with antenatal care services in both urban and rural areas.

The study revealed strong differentials in how urban and rural women received antenatal care. Urban women received antenatal care and had antenatal visits, more than rural women. It showed that more than half of the urban women used antenatal care while about one-quarter of the rural women used antenatal health-care services in Bangladesh. It was also revealed in the study that many of the urban women, compared to few rural women who had access to antenatal care, had their blood pressure and weight checked. The women's level of education, wealth index, description of pregnancy complications, the number of children that they had, permission to go to hospitals or health centres from their spouses, source of drinking waters, access to mass media and regional divisions were significant determinants of receiving antenatal care. It was revealed in the study that the level of education of each women, revealed a positively significant association with women's chances for seeking antenatal care services in both rural and urban areas. Women who cannot describe pregnancy complications were less likely to receive antenatal care services in both rural and urban areas. The wealth index revealed a significant association

with antenatal care utilization in both rural and urban areas. Middle class and rich women of Bangladesh were more likely to use antenatal care compared to their poor counterparts in both the urban and rural areas. However, other significant determinants of antenatal care utilization in Bangladesh were only significant in the rural areas. It was revealed that mothers who had more than five children were more likely to use antenatal care. Rural women who were allowed to visit hospital alone, who have access to the mass media and who drank well sanitized water, were more likely to use antenatal care compared to their reference categories respectively.

Navaneetham and Dharmalingam (2000) researched on the Utilization of Maternal Healthcare services in Southern India. The study used data from the National Family Health Survey (1992-1993) to investigate the levels of and factors that are significantly associated with using maternal healthcare services in Andhra Pradesh, Karnataka and Tamil Nadu. The study revealed that the level of maternal healthcare services was highest in Tamil Nadu, followed by Andhra Pradesh and Karnataka respectively. The State of Tamil Nadu was excluded from the logistic analysis because of high prevalence of almost hundred percent of antenatal care utilization in the state. Caste was a significant determinant of antenatal care utilization in Andhra Pradesh. In Karnataka and Andhra Pradesh, birth order was a significant predictor of antenatal care. Similarly, women's work status and exposure to mass media were significant in both states. The level of education of the women and their spouses, experience of induced or spontaneous abortion and place of residence were significant predictor of antenatal care utilization in Karnataka only. Lower utilization of maternal health care services was experienced among the urban women, when compared to the rural women. This was due to effective healthcare facilities in the clinics and the commitment of medical personnel in the rural areas. Findings from the study thus suggest that

health worker availability was associated with the increase in the usage of antenatal care services in the rural areas.

Elizabeth Eggleston (2000) conducted a study on unintended pregnancy and women's use of antenatal care in Ecuador. The 1994 Demographic and Maternal Health Survey data was used to examine the relationship between unintended pregnancies, both unwanted and mistimed, and several dimensions of prenatal care use among women in the country. Contrary to what other findings showed, Eggleston's study revealed that there was no association between urban residence and more use of antenatal care when compared to rural residence thereby revealing no difference in antenatal care utilization when the criteria of residence is used to conduct the survey. This could be because of good health system in Ecuador (Monica et al., 2003). However, the study showed that women in the urban settlements had a higher odd in starting antenatal visits in the first trimester and ensured an adequate number of visits to clinics than the rural women. It also showed that women who had unwanted pregnancies were less likely to seek antenatal care services, compared to women who had planned for the pregnancy. Women who had unwanted pregnancies were also less likely to seek antenatal care services early and receive adequate antenatal care services than women who had planned their pregnancies.

Regassa (2011) investigated the utilization of antenatal and postnatal care service, using the southern Ethiopian population for the study. A questionnaire was used to investigate the factors that are significantly associated with antenatal care and postnatal care use. The study revealed that the age of women, reaction to previous pregnancies, work status, children ever born, frequency of radio listening and educational status were significantly associated with antenatal care use while children ever born, frequency of radio listening, marital status and educational

status were significantly associated with post natal care use. It was revealed in the study that women with high levels of education and exposure to mass media, have higher usage of antenatal and postnatal care respectively. Women who reported that they would have wanted to wait or did not want to be pregnant with their last babies were less likely to use antenatal care than women who wanted their last pregnancies. Monogamous women were more likely to use post-natal care than women who were engaged in polygamous relationships. However, unlike previous findings that revealed low utilization of antenatal care in the rural areas, in many developing countries, this study showed high antenatal care use by women in the rural areas of Ethiopia.

The differences in patterns of antenatal care use, across countries in the developing world, including sub-Saharan Africa, when residence and wealth status variables are employed, could be as a result of variation in the quality of health system across these different developing countries of the world. According to Monica et al. (2003), even the urban poor may be more disadvantaged in allocation and utilization of antenatal services than rural residents, especially in a country that has a good health system. Studies have been conducted in sub-Saharan African countries that revealed differentials in the utilization patterns of antenatal care between rural and urban residents. A study was done in Sudan on the antenatal care use among women of reproductive age in Sudan (Ibnouf et al., 2007). Information collected from the interview of a sample of 400 married women aged 15-49 years from both urban and rural localities in Khartoum State, was used to describe the current antenatal care condition in Sudan. The study focused on routine antenatal care services use and tetanus toxoid (TT) injection use in rural and urban areas. It was found from the study that there was more utilization of routine antenatal healthcare services and application of TT- vaccination among the urban women, when they are compared to the women in the rural areas. This revealed an urban-rural differential in the

utilization of antenatal care and TT-vaccination. Other factors such as higher quality of care, shorter walk-time to health facility and mother's education were significant determinants of routine antenatal care use (Ibnouf et al., 2007). It revealed that higher quality of care was significantly associated with routine antenatal care utilization. The shorter the walk-time to health facility, the more likely is the use of routine antenatal care services. Similarly, a woman's educational level was significantly associated with routine antenatal care utilization, as the higher the level of educational attainment of women in Sudan, the more likely would be the use of routine antenatal care (Ibnouf et al., 2007).

In his study that investigated knowledge of and improvement on maternal health services provision and utilization among urban poor women in Kenya, Fotso et al. (2008), revealed that urban poor settlements were being denied public health services. The study also revealed that high frequency of antenatal care in Nairobi did not favour the urban poor. It revealed that urban poor women who consistently attended the recommended number of antenatal visits or who started visiting antenatal care centres earlier in pregnancy was relatively low when they were compared to the whole of Nairobi's urban residents and the rural residents of the country. This revealed that the urban poor are disadvantaged in antenatal care utilization when compared to the urban non-poor and their rural counterparts. The study also revealed that household wealth, education, parity, and place of residence were significantly associated with ANC consistency and timing.

A study conducted on the missed opportunity of information, education and communication in antenatal care in Gambia used a survey size of 457 pregnant women who were visiting six urban and six rural antenatal clinics in the largest health division of Gambia was used to assess

differences in information, education and communication of antenatal care services between rural and urban women. The study revealed that women who received antenatal care in the rural clinics were more likely to present dangerous signs of anaemia and hypertension when compared to women attending urban antenatal clinics (Anya et al., 2008).

As earlier stated, previous studies done in Nigeria, that addressed determinants of antenatal care utilization patterns, could not infer conclusions from the general population. Most studies elaborately discussed the determinants of utilization of antenatal care or the pattern of use of antenatal care in a specific state, region or locality. Only few studies considered the determinants of the pattern of antenatal care use at the national level (Okafor, 1991; Nwakoby 1994; Osubor et al., 2006). This limited the abilities of most studies to give a representative policy and programme recommendation for Nigeria. Babalola and Fatusi (2009) researched on the determinants of maternal service utilization in Nigeria. A multi-level analysis was done in this study, which included individuals, household, community and state level analysis. Data from the 2005 National HIV/AIDS and Reproductive Health were used to examine individual, household and community determinants of maternal care services among 2148 women who had a baby at least five years prior to the survey. The study used antenatal care, medical personnel available at time of delivery and post-natal care as the indicators of maternal care services. Findings revealed that education, attitude towards family planning, and age at last birth were significantly associated with antenatal care utilization at the individual level. Women who were educated beyond secondary level were more likely to use antenatal care than their counterparts who had no education. Similarly, as the age at last birth increases, the use of antenatal care also increases. At the household level, women from the richest households were six times more likely to use antenatal care than their poor counterparts while women who lived in an urban residence were

two times more likely to use antenatal care than their rural counterparts. The study revealed that high levels of media access were not significantly associated with antenatal care utilization while medium levels of access were significantly associated with antenatal care utilization. Moreover, women's levels of education, socio-economic levels, urban residence and community media saturation are significant predictors of maternal health service utilization at all the stages of analysis except at the state level. A woman's age at the birth of the last child, ethnicity, notion of ideal family size, approval of family planning, prevalence of the small family norm in the community and ratio of primary health care to the population revealed variations in predicting maternal healthcare utilization at individual, household, community and state levels respectively.

Dairo and Owoyokun (2010) conducted a study on the factors affecting the utilization of antenatal care services in Ibadan, Nigeria. Four hundred women in two randomly selected local government areas of Ibadan were surveyed to achieve the study objective of investigating the factors that are associated with antenatal care use in Ibadan. The study revealed a significant difference in residence, religion and age in relationship with antenatal care use in the city. The women in the urban areas utilize antenatal care more than women in the rural areas. It also revealed that Muslim and other religions' women were more than twice likely to use antenatal care than Christian women. It revealed that religious leaders and religious organizations could play an important role in influencing their followers towards utilizing antenatal care in Nigeria. Older women of twenty five years and above were more than twice more likely to use antenatal care than the younger women of reproductive age. Therefore, the study suggested that intervention programmes should target the promotion of antenatal care services in the rural areas, among younger women and Christian women.

A research was conducted in Sagamu, Nigeria on the utilization of antenatal care and delivery services (Iyaniwura and Yusuf, 2009). The study used a sample of selected 392 women who had at least one successful delivery in Sagamu area to examine the patterns of maternal health services and also assess the determinants of the pattern of maternal health services. It was revealed in the study that majority of the respondents who received antenatal care used government antenatal facilities followed by private facilities while a few used traditional facilities. Those who gave details about their reasons for using any facility reported that it was good, especially those who used the government antenatal facilities. Those who used private medical facilities also used them because they were good and near to their homes, but those who used traditional antenatal facilities did so to please their husbands. Findings from the study revealed that antenatal and delivery services' use increased as higher educational status and, or higher level of income was attained. This implies that women who had education beyond secondary school levels were more likely to use antenatal and delivery care, compared to their rural counterparts. Similarly, richer women were more likely to use antenatal care than their poor counterparts in Sagamu. Therefore, if the socio-economic status of women, specifically their educational attainment and wealth status, were increased in the community, then there would be improvement in the utilization of maternity care services (Iyaniwura and Yusuf, 2009). Another major factor that influenced utilization of any health care service was the perceived quality of service. It was reported that those who failed to use government health facilities did so because they perceived that poor services would be rendered to them at such places.

In addition, Kabir et al. (2005) studied the factors that are significantly associated with the use of antenatal care services in rural northern Nigeria. The study was a descriptive study specifically done in a village setting of Kumbotso in Kano, Nigeria. The study used data from 200 women of

childbearing age in this village community to assess factors that significantly determine antenatal care use in the village. It was revealed that 59% of the respondents used antenatal care and 41% did not use antenatal care in the community. The study found that the level of women education and the education of their husbands were positively associated with antenatal care use among rural women. Women who had more than secondary school education were more likely to use antenatal care, compared to women with secondary and primary school education. Likewise, women whose husbands were educated beyond primary level were more likely to use antenatal care than their counterparts whose husbands were only primary school graduates (Kabir et al., 2005). This study revealed the importance of education in antenatal care utilization in Nigeria. In addition, all the women who were employed in the civil service used antenatal care, compared to a little above fifty percent for women who were fulltime housewives. The reasons why women did not use antenatal care in the community was also revealed in the study. Among the reasons mentioned, feelings of being healthy and husband's disapproval had the highest, followed by unaffordable cost of service, cultural and religious factors and lack of transport to the healthcare facilities. Moreover, the studies that have been previously examined have revealed the factors that determine antenatal care use and how low usage of antenatal care was indicated among rural residents when compared to urban residents. These studies were limited in that they did not reveal the factors that were associated with the urban-rural differences in the use of antenatal care. Also, the above studies were limited in sample size and geographical scope as they concentrated on a handful of communities (Okafor, 1991; Nwakoby 1994; Osubor et al. 2006). This therefore limits their applicability to a socially changing society like Nigeria. These limitations make it imperative for this study to be done in order to establish the determinants of the differentials in the pattern of utilization of antenatal care services within and between rural

and urban areas, which could be useful for representative health decisions on the Nigerian population.

2.2. Theoretical framework

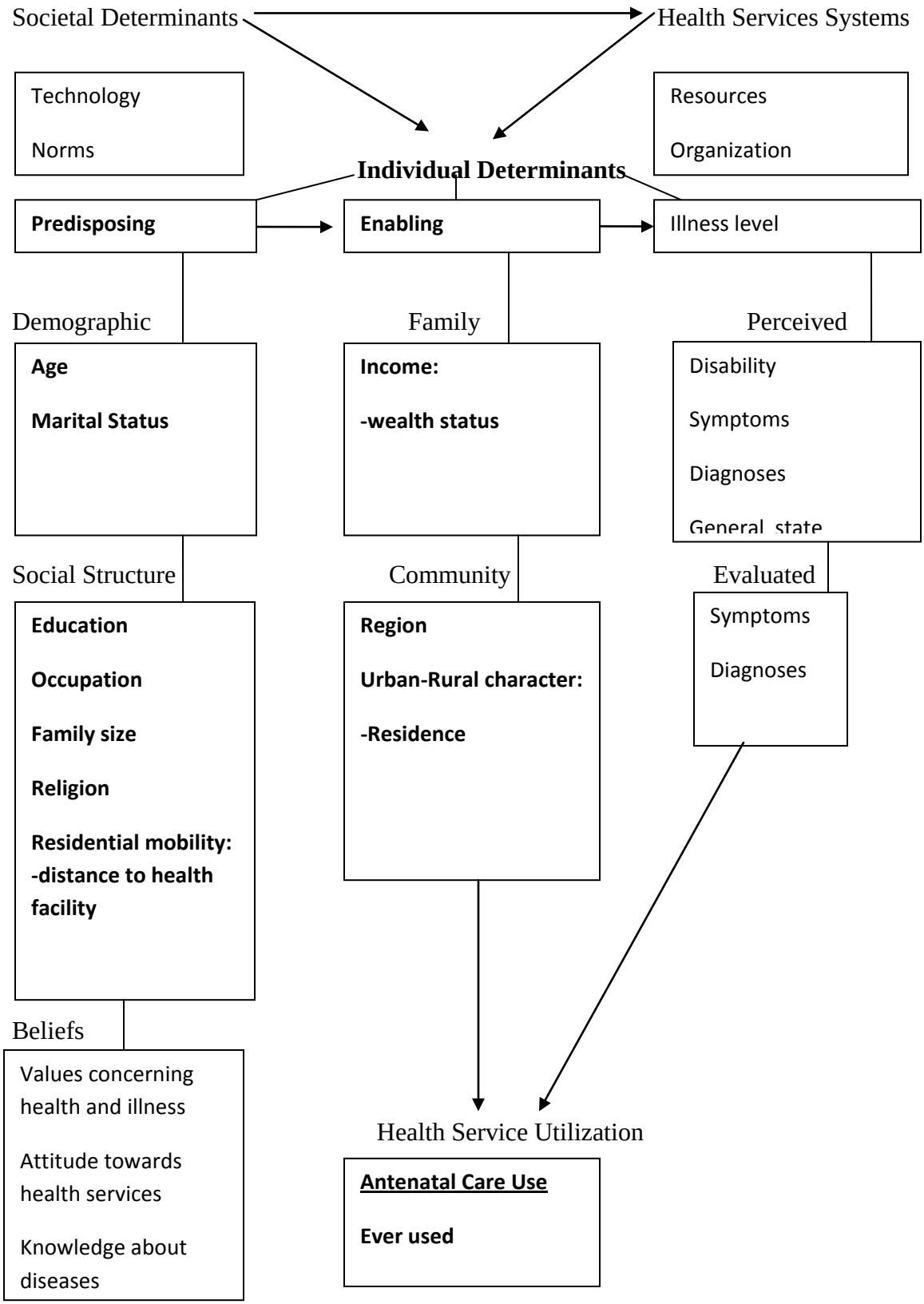
The theoretical framework for this study is the Andersen's behavioural model (2005). This model was developed to explain factors that determine the use of health services in United States of America. It examined the influence of individual and health system factors on the pattern of health service use. The framework theorized the following variables that influence the health seeking decision:

Predisposing factors: These are factors that prompt people towards health service utilization. They include age, sex, marital status, family size, social status, education and race.

Enabling factors: These are conditions that make health service resources available to an individual. They include household or family income, urban-rural character, health insurance, and health service availability.

Illness level: This is a perception of the necessity for a health service. This, according to Andersen, is the most powerful predictor of utilization. Even when an individual is predisposed to a particular type of sickness and he has the means to seek a health facility, if he has no need for it, then he would not seek health care (Andersen and Newman, 2005).

Figure 1: Andersen Theoretical Framework of Health Service Utilization (2005)



The Andersen theoretical framework of health service utilization is the most appropriate framework to achieve the objectives for this study. The Andersen framework was developed to explain the factors that determine the use of health services in United States of America. This framework was used in a study on societal and individual determinants of medical care utilization in the United States (Andersen and Newman, 2005). It is noteworthy that our study seeks to identify the factors that determine the urban-rural differentials of antenatal care use in Nigeria. Our study is different in that the urban-rural differentials in utilization was examined and also investigated in a different geographical location, which is Nigeria. However, we were conscious of the fact that adopting this model, Andersen theoretical framework, in Nigeria, a different setting from the United States where it was developed, could pose certain challenges to this research. The individual and social determinants of health service utilization in the United States may not be exactly the same as in Nigeria.

Certain variables of the framework were not included in this study as they were not captured in the secondary data used for this study. This study made use of only the predisposing and enabling individual determinants of health service utilization. The illness level factor was not considered in this study because questions that should reveal the illness or the need level of antenatal care by pregnant women were not asked in the 2008 Nigeria Demographic and Health Survey. Predisposing factors were further classified into demographic, social structure and belief factors while enabling determinants of health service utilization were classified into family and community factors. The health service considered in this study was antenatal care. Thus, antenatal care utilization was the dependent variable for this study. The demographic factors used for this study include age and marital status. Social structure factors used in this study are

education, occupation, family size, religion and residential mobility, which were represented by distance to health facility in this study. Belief factors were not considered in this study as questions on belief systems were not asked in the 2008 Nigeria Demographic and Health Survey. Enabling determinants of health service utilization used in this study include income, which was defined in this study as wealth status, region and urban-rural character. The only urban rural character used in this study was residence.

2.3. Hypothesis

Ho: There is no determinant of the difference in antenatal care utilization between the rural and the urban women.

Hi: There is a determinant of the difference in antenatal care utilization between the rural women and the urban women.

CHAPTER 3

METHODOLOGY

3.1. Introduction

This chapter contains the methodology used to achieve the objectives of this study. It gives a detailed and sequential explanation of the data source, sampling design, variables, data management, data analysis and ethics considered in this study.

3.2. Data source:

The 2008 Nigeria Demographic and Health Survey (NDHS) was used for the analysis of this study. The objective of the 2008 NDHS was to provide a reliable, precise and nationally representative estimate of important population characteristics such as fertility, contraceptive use, and certain indicators of health, which include infant mortality and HIV/AIDS status for men and women (NPC, 2009). The National Population Commission implemented the 2008 Demographic and Health Survey in Nigeria. This project was done between June and October, 2008. The survey was technically assisted and funded by ICF Macro through the Measure DHS project.

3.3. Sampling design and data processing

The 2008 Nigeria Demographic and Health Survey (NDHS) data was used for this study. The survey sample was selected by stratifying into two; stage 888 clusters, which comprised of 286 urban clusters and 602 rural clusters. After allocating the number of households to each state, the number of clusters (calculated averagely on a sample take of 41 completed respondents or about 41 selected households) was calculated by dividing the total sample size in each state by the

sample take. Finally, all women of reproductive age (15-49 years) were interviewed in each cluster through the instrument of a questionnaire. This makes the study to be nationally useful for prediction and policy purposes. Socio-economic and demographic information as well as pregnancy history were collected. Antenatal care information was also collected in the survey. The 2008 Nigeria Demographic and Health Survey measured antenatal care by the proportion of women who received any antenatal care during pregnancy in the five year preceding the survey (NPC 2008).

Between June and October, 2008 the National Population Commission of Nigeria executed the Nigerian Demographic and Health Survey. ICF Macro funded the research through the Measure DHS. The Survey interviewed 36,800 women, aged 15-49 years, from all states in the country. However, the number of women used for this study is 16,178 women aged between 15-49 years who had had one or more births within the five years preceding the survey (NPC 2008). The women dataset of the NDHS will be used for this study.

3.4. Study population and sample size

Women of reproductive age (15-49) were interviewed in the Nigeria Demographic and Health survey sample. However, a total of 34,596 women were selected as the NDHS sample and 33,385 women responded appropriately in the survey. This showed a response rate of 96.5%. Out of the sample, the 16,178 women with one or more births, five years before the survey, were eligible for this study.

3.5. Variable description and measurement

Table 1: Variable definitions and measurement

VARIABLE	VARIABLE DEFINITION	MEASUREMENT
DEPENDENT VARIABLE		
Antenatal care	The treatment received for pregnancy by women with one or more live births five years before the 2008 Nigerian Demographic and Health Survey. Women who received at least four treatments during pregnancy were categorized as "yes" while women who received less than four antenatal treatments were categorized as "No". Antenatal care was re-categorized into binary to reveal the performance of Nigeria as regards WHO improved model for antenatal care use for women who do not have complicated pregnancy. The model recommended at least four antenatal care visits which would include compulsory blood pressure measurement, urine and blood tests and non-compulsory weight and height check at each visit (WHO and UNICEF 2003). This recommendation by the World Health Organization had been made since 2003 and every countries of the world should have aligned themselves to it ten years after if any improvement would be achieved in pregnancy and maternal health outcomes.	No (0) Yes (1)
DEMOGRAPHIC VARIABLES		
Age	Age of women	15-24 (0) 25-34 (1) 35+ (2)
Marital Status	Marital Status	Never married(0) Currently married (1) formerly married (2)
Region	Region-	North central (0) North east (1) North west (2) South east (3)

		South west (4) South- South (5)
Residence	Residence	Urban (0) Rural (1)
SOCIO ECONOMIC VARIABLES		
Women education	Women's educational level	No education (0) Primary (1) Secondary (2) Higher (3)
Partner's education	Partner's education level	No education (0) Primary (1) Secondary (2) Higher (3)
Religion	Religion	Catholic (0) Other Christian (1) Islam (2) Others (3)
Wealth Status	Wealth status	Poor (0) Non-poor (1) This categorization was done because the rich and middle class in Nigeria showed collinearity, thus they were merged together as non-poor.
Employment	Respondent currently working?	No (0) Yes (1)
Living Children	How many children does the respondent have alive?	None (0) 1-2 (1) 3-4 (2) 4+ (3)
Distance to health facility	Getting medical help for self	Not a big problem (0) Big problem (1)

The variables for this study were adopted from the Anderson framework of 2005. This model examined the influence of individual and health system factors on the pattern of health service use. The predisposing and enabling factors of health service utilization were selected in this study, leaving out the illness or need factor as there was no question on illness factor in the 2008 Nigeria Demographic and Health Survey. The predisposing factors were age, marital status,

which were classified under demographic variables, while education, occupation, number of living children (family size), religion and distance to health facility (residential mobility) were classified under social structure variables. Enabling factors include income, which was classified under family variable, and region and residence, which were classified under community enabling factors (Andersen, 2005).

In addition, the demographic and socio-economic variables of this study were selectively chosen, after critically reviewing previous studies, to see the determinants of antenatal care utilization that were tested in those studies. For instance, a study by Rahman et al. on the rural-urban differentials in antenatal care utilization of antenatal health care services in Bangladesh examined mother's education, husband's education, mother's occupation, husband's occupation, religion, region, wealth index, mother's age, children ever born in relation to antenatal care utilization (Rahman et al. 2008). Bloom et al. also utilized surviving children and other socio-economic and demographic variables such as age of mothers, economic status, education, employment status and other variables to examine the dimension of women autonomy and the influence on maternal health care utilization in a north Indian city (Bloom et al., 2001).

Also, a correlation test was done to examine if there existed correlation between any of the independent variables. The correlation test revealed that there was no correlation between any of the independent variables. Thus, each of the independent variables selected for this study were independent of one another and suitable for it to be included in the study.

3.6. Data management

The data used for this study was downloaded from the Macro International website. Request to use the 2008 Nigerian Demographic and Health Survey was made to the Macro International

Incorporation and a written permission was granted through the Macro International website. The Stata format of the data was downloaded because the analysis of the research would be done with the Stata package.

Having downloaded the dataset, the women sub-data were used for the analysis of the study. Over 500 variables were found in the women's sub-data of the NDHS. However, from the variables in the women sub-data, about 15 variables were chosen for the purpose of this study. The chosen variables were explained above in section 3.4.1.

For the purpose of proper analysis of this data, the Stata 11 statistical package was used to remove the women of reproductive age who had no birth in the five years before the period of the survey.

Thereafter, using the Stata package, certain other variables were dropped. The variables needed for this study, which include age, region, residence, women education, religion, wealth index, distance to health facility, current marital status, partner's education, women employment status, and number of living children were retained for the analysis.

Those variables that were retained were renamed and re-categorized. The variable named 'antenatal care use' was derived from the number of antenatal care visits and was re-categorized into two categories. Women who received less than four antenatal care visits were categorized as 'No' while those who received four or more antenatal care visit were grouped as 'Yes'. This grouping was based on the World Health Organization's recommendation of at least four antenatal care visits for women without complicated pregnancy in developing countries (WHO and UNICEF, 2003). This implies that going by the recommendation of the WHO, for any

pregnant woman to be classified to have used antenatal care for any pregnancy, she must have had antenatal care visits at least four times.

The wealth index was re-categorized into poor and non-poor, in which the poorer and poorest were grouped into “poor”, the middle, richer and richest were grouped as “non-poor”. A continuous data such as number of living children was re-categorized into no child (0), one to two children (1), three children to four children (2) and 4 children (3). This was done in line with the flexible policy of four children per an average sized family in Nigeria (Federal Government of Nigeria, 1988). Also, no child category was retained in the number of living children because some women who had a birth or more in the last five years before the survey could have lost their children as a result of death. Thus, they have no living child but had experienced live birth five years before the survey. For the age variable, 15-19 and 20-24 were merged together, 25-29 and 30-34 were merged together and 35-39, 40-44 and 45-49 were merged together as 35+. The religion variable re-categorized as Catholic (1), Other Christian (2), Islam (3) while traditionalist and others were merged together as others (4).

3.7. Data analysis

For this study, univariate, bivariate and multivariate analyses were done to meet the objectives of the study. The association between the dependent variable (antenatal care utilization) and the socioeconomic and demographic variables was examined using the odds ratio at P-value of <0.05 and 95 percent confidence interval. For the analysis of this research, Stata version 11 was mainly used. The univariate analysis showed the frequency distribution of the socioeconomic and demographic characteristics of women with one or more births in five years before the survey.

However, to achieve the first objective, a bivariate analysis was done, using chi-square test. Chi-square test was also used to examine the socioeconomic and demographic factors that are associated with antenatal care utilization pattern of women in rural and urban areas. However, socioeconomic and demographic factors that were significantly associated with antenatal care use in the rural areas, urban areas and Nigeria as a whole, at the bivariate level, were included in the multivariate analysis.

For the multivariate analysis, the multiple regression was used to determine the significant factors associated with urban-rural differential in Antenatal Care (ANC) use to achieve the second objective. The multiple logistic regression equation adopted in this study was:

$$Logit\ (Y_i) = \theta + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_i X_i$$

Where Y_i= dependent variable (antenatal care); θ= constant; β_i= Co-efficient; X_i= independent variables. (Daniel Wiechmann, 2013)

A logistic regression was used because the dependent variable was binary. For the multivariate analysis, three models were used. Model 1 revealed the socio-economic and demographic factors that are significantly associated with antenatal care use in the rural areas. Model 2 represented the socio-economic and demographic factors that are associated with antenatal care use in the urban areas of Nigeria. Model 3 revealed the socio-economic and demographic factors that are associated with antenatal care use in the rural and urban models combined.

3.8. Ethical considerations

This study used the 2008 Nigerian Demographic and Health Survey data. These data were used with the permission of the ICF Macro through a written permission from their website. However,

before the 2008 NDHS was done, appropriate consent was got from the respondents by the ICF Macro and other ethical issues were considered. Therefore, this study relied on the ethical consideration of the ICF Macro for the 2008 NDHS. Thus, this study poses no ethical threat to the respondents as informed consent and privacy of the respondents were taken into consideration at the time of the 2008 survey.

CHAPTER 4

PROFILE OF RESPONDENTS

4.1. Introduction

The profiles of respondents are presented in this chapter. This chapter reveals the percentage distribution of respondents by selected demographic and socio-economic characteristics in the rural and urban areas of Nigeria, as well as in Nigeria as a whole. It further goes on to reveal the percentage distribution of antenatal care utilization for most recent births by mothers who had a live birth in the five years before the survey using selected demographic and socio-economic characteristics used as the control for rural and urban residence.

4.2. Characteristics of the study population

Table 2 reveals that women who had a live birth in the five years before the 2008 demographic and health survey were more in the age group 25-34 (46.32%) than women in age group 15-24 (26.74%) and 35+ (26.96%). The north-west region has the highest percentage of women with at least one live birth five years before the survey (27.37%) compared to the south-east, which has the lowest (7.15%), followed by the south-south (10.87%), the south west (12.17%), the north central (18.78%) and the north east (23.66%). About 73.98% of the respondents lived in the rural areas, compared to 26.02% of respondents in the urban areas. More than half of the respondents had no education (50.43%), 22.48% of them had primary education, 22.18% had secondary education while 4.90% had higher education. This reveals the low level of importance attached to the education of women in Nigeria. More than half of the respondents (56.60%) were practising Islam, 33.01% were other Christians, only 8.35% were Catholics and 2.04% were others, which included traditionalists.

In addition, respondents in the poor category had the highest percentage (51.58%) compared to those in the non-poor category (48.43%). Respondents who had problem with distance to health facilities were (40.38%) compared to those who had no problem with the distance to health facilities (59.62%). Most of the respondents were married (94.52%) while those who were never married were just (2.49%) and those who were formerly married were 2.99%. Most of the respondents were employed (64.65%) while the percentage of the unemployed was 35.35%. Respondents who had 1-2 living children had the highest percentage (36.17%), followed by those who had 3-4 living children (33.29%), those with more than four living children (29.52%) and respondents who had no living children at the time of the survey were only 1.02%. The rural poor respondents had the highest percentage (48.52%), followed by the rural non-poor (25.46%), the urban non-poor (22.96%) and the urban poor (3.06%). Married women whose partners had no education were 42.49% which was the highest percentage, followed by those with secondary education (26.02%), primary education (20.54%) and higher education (10.95%) (WHO and UNICEF, 2003; NPC and ICF Macro, 2009). However, the percentage of urban women who used antenatal care (74.54%) was higher than the percentage of rural women who used antenatal care (36.42%).

In the rural areas, women who had a live birth in the five years before the 2008 demographic and health survey were more in the age group 25-34 (44.41%) compared to women in age group 15-24 (28.43%) and 35+ (21.16%). The North-west region had the highest percentage of women with at least one live birth five years before the survey (31.69%) compared to the South-east, which had the lowest (5.83%), followed by the South-west (7.57%), the South-south (11.14%), the North-central (18.82%) and the North-east (24.95%). More than half of the rural respondents had no education (58.39%), 22.56% of them had primary education, 16.87% had secondary

education and 2.18% had higher education. More than half of the respondents (59.10%) were practising Islam, 30.75% were non-Catholic Christians, only 7.82% were Catholics and 2.33% were others, which included the traditionalists. Respondents in the poor category had the highest percentage (65.58%) compared to those in non-poor category (34.42%). Respondents who had problem with distance to health facilities were (47.13%) compared to those who had no problem with the distance to health facilities (52.87%). Most of the respondents were married (94.55%) while those who were never married were just (2.50%) and those who were formerly married were 2.95%. Most of the respondents were employed (63.14%) while the percentage of the unemployed was 36.86%. Respondents who had 1-2 living children had the highest percentage (35.50%), followed by those who had 3-4 living children (32.64%), those with more than four living children (30.72%) and respondents who had no living children at the time of the survey were only 1.14%. The rural poor respondents were 65.58% while the rural non-poor were 34.42%. Formerly or currently married women whose partners had no education were 49.85%, with the highest percentage, followed by secondary education (22.11%), primary education (21.06%) and higher education (6.98%). The percentage of rural women who used antenatal care was (36.42%) while 63.58% were those of the rural women do not use antenatal care.

In the urban areas, women who had a live birth in the five years before the 2008 demographic and health survey were more in the age group 25-34 (51.78%), compared to women in age group 15-24 (21.92%) and 35+ (26.29%). The South-West region had the highest percentage of women with at least one live birth five year before the survey (25.25%), compared to the South-South, which had the lowest (10.12%), followed by the South-East (10.90%), the North-West (15.08%), the North-Central (18.67%) and the North-East (19.98%). About 27.81% of the urban residents had no education, 22.26% of them had primary education, 37.29% had secondary education and

12.64% had higher education. About 49.50% of them were practising Islam, 39.43% were non-Catholic Christians, only 9.86% were Catholic and 1.21% were others, which included the traditionalists. Respondents in the rich category had the highest percentage (69.50%) compared to those in the poor category (30.5%). Respondents who had problem with distance to health facilities were (21.19%) compared to those who had no problem with the distance to health facilities (78.81%). Most of the respondents were married (94.42%) while those who were never married were just (2.47%) and those who were formerly married were 3.11%. Most of the respondents were employed (68.95%) while the percent unemployed was 31.05%. Respondents who had 1-2 living children had the highest percentage (38.08%) followed by those who had 3-4 living children (35.15%), those with more than four living children (26.08%) while respondents who had no living children at the time of the survey were only 0.69%. The urban poor respondents were (11.76%) and the urban non-poor were (88.24%). Formerly or currently married women whose partners had no education were 21.58%, those whose partners had primary education (19.07%), those with secondary education (37.14%) and those with higher education (22.21%). The percentage of urban women who used antenatal care was 74.54% while 25.46% did not use antenatal care.

Table 2: Urban, rural and national frequency distribution of the background characteristics of women with one or more birth prior to the 2008 DHS in Nigeria

VARIABLES	Rural		Urban		All	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
DEMOGRAPHIC VARIABLES						
Age						
15-24	3,402	28.43	923	21.92	4,325	26.74
25-34	5,315	44.41	2,180	51.78	7,496	46.32
35+	3,251	27.16	1,107	26.29	4,358	26.96
Current Marital Status						
Never married	299	2.50	104	2.47	403	2.49
Married	11,316	94.55	3,975	94.42	15,291	94.52

Formerly married	353	2.95	131	3.11	484	2.99
Region						
North central	2,252	18.82	786	18.67	3,038	18.78
North east	2,986	24.95	841	19.98	3,827	23.66
North west	3,793	31.69	635	15.08	4,428	27.37
South east	698	5.83	459	10.90	1,157	7.15
South-South	1,333	11.14	426	10.12	1,759	10.87
South west	906	7.57	1,063	25.25	1,969	12.17
Residence						
Urban			4,210	100.00	4,210	26.02
Rural	11,968	100.00			11,968	73.98
SOCIO-ECONOMIC VARIABLES						
Women Education						
No education	6,988	58.39	1,171	27.81	8,159	50.43
Primary	2,700	22.56	937	22.26	3,637	22.48
Secondary	2,019	16.87	1,570	37.29	3,589	22.18
Higher	261	2.18	532	12.64	793	4.90
Partner's education						
No education	5,817	49.85	886	21.58	6,703	42.49
Primary	2,457	21.06	783	19.07	3,240	20.54
Secondary	2,580	22.11	1,525	37.14	4,105	26.02
Higher	815	6.98	912	22.21	1,727	10.95
Religion						
Catholic	936	7.82	415	9.86	1,351	8.35
Other Christian	3,680	30.75	1,660	39.43	5,340	33.01
Islam	7,073	59.10	2,084	49.50	9,157	56.60
Other	279	2.33	51	1.21	330	2.04
Wealth status						
Poor	7,849	65.58	495	11.76	8,344	51.58
Non-poor	4,119	34.42	3,715	88.24	7,834	48.42
Employment						
No	4,412	36.86	1,307	31.05	5,719	35.35
Yes	7,556	63.14	2,903	68.95	10,459	64.65
Living Children						
None	136	1.14	29	0.69	165	1.02
1-2	4,249	35.50	1,603	38.08	5,852	36.17
3-4	3,906	32.64	1,480	35.15	5,386	33.29
5+	3,677	30.72	1,098	26.08	4,775	29.52
Distance to Health Facility						

Big problem	5,641	47.13	892	21.19	6,533	40.38
Not a big problem	6,327	52.87	3,318	78.81	9,645	59.62
Antenatal Care Use						
Yes	4359	36.42	3138	74.54	7,497	46.34
No	7,609	63.58	1,072	25.46	8,681	53.66
Total	11,968	100.00	4210	100.00	16,178	100.00

4.3. Distribution of antenatal care use by selected demographic and socio-economic variables controlling for urban- rural residence:

Table 3 reveals the socio-economic and demographic factors that are associated with urban-rural differentials in antenatal care use in Nigeria. In the rural areas, age, region, women education, religion, distance to health facilities, current marital status, employment, number of living children, partner's education and wealth status were significantly associated with antenatal care use. Similarly, in the urban areas, age, region, women education, religion, distance to health facilities, current marital status, employment, number of living children, partner's education and wealth status were significantly associated with antenatal care.

The percentage distribution of the socio-economic and demographic determinants of antenatal care in the rural and urban areas respectively were revealed in Table 4.2. In the rural areas, women in the age group 25-34 had the highest percentage of antenatal care use (39.53%), followed by women at age 35+ (36.70) and then women of age 15-24 (31.31%). South-West women had the highest percentage of antenatal care use (83.66%), followed by women in the South-East region (70.20%), women in the South-South region (57.69%), women in the North-Central region (47.16%), women in the North-East region (26.26%) while women in the North-West region had the lowest use of antenatal care (13.08%). Women's level of education revealed a positive association with the pattern of antenatal care utilization. The more women's level of

education increases, the higher their use of antenatal care. Rural women with primary education recorded antenatal care use of 52.07%. Antenatal care use increased among women with secondary education (69.59%) and an even higher percentage was recorded among women who acquired higher level of education (89.29%). Almost all the women with a higher level of education used antenatal care. Illiterate women reported the lowest use of antenatal care (18.82%).

Other Christians apart from Catholic women displayed the highest level of antenatal care use (59.32%), followed by the Catholic Christians (52.56%), women who fell under the category of other religion, which include traditionalists and others (25.45%) and Muslim women (22.81%). Distance to health facility\ies was also a major factor determining the use of antenatal care in rural Nigeria. Women who reported that distance to a health facility was not a big problem reported higher use of antenatal care (42.88%) compared to those who reported distances to health facilities as a problem (29.18%). The highest percentage of antenatal care use was reported among the never married women (51.17%), followed by formerly married women (47.03%) and then currently married women (35.70%). The differences experienced in the use of antenatal care by marital status may be due to the limiting influence of partners, as married women may need to seek permission to go out for such treatment from their husbands, which the unmarried or not currently married women did not need to do. Women employment status also revealed a consistently positive relationship with antenatal care use. It was revealed that employed women use antenatal care (41.94%) more than unemployed women (26.97%). Women who had 1 to 2 living children had the highest use of antenatal care (38.69%), followed by women with 3 to 4 living children (36.64%). Next are women with 4 or more children (33.80%) and the least were women with no living child (30.15%). Partner's education level also

revealed a positively significant association with antenatal care use in the rural areas of Nigeria. Women whose partners had higher level of education had the highest use of antenatal care (70.31%), followed by women whose partners had secondary education (58.84%), women whose partners had primary education (46.72%) while women whose partners were illiterate made up the least group (16.62%). About 36.42% of rural women received antenatal care. Rural poor women who received antenatal care were 22.58% while rural non-poor women who received antenatal care were 62.81%.

In the urban areas, women in the age group 25-34 had the highest percentage of antenatal care use (79.27%), followed by women at age 35+ (72.54%) and then women of age 15-24 (65.76%). South-West women had the highest percentage of antenatal care use (94.07%), followed by women in the South-East region (79.52%), women in the South-South region (78.87%), women in the North-Central region (76.21%), women in the North-East region (58.26%) while women in the North-West region had the lowest use of antenatal care (54.80%). Women's level of education revealed a positive association with the pattern of antenatal care utilization. The more the women's level of education increases, the higher their use of antenatal care.

Urban women with primary education recorded antenatal care use of 73.96%.The antenatal care use increased among women with secondary education (86.43%) and an even higher percentage was recorded among women who acquired higher level of education (94.74%). Illiterate women reported the lowest use of antenatal care (49.87%). Other Christians apart from the Catholic displayed the highest level of antenatal care use (83.25%), followed by the Catholic Christians (81.45%), then Muslim women (66.51%) and others, which included traditionalists (62.75%). Distance to health facilities was also a major factor determining the use of antenatal care in urban Nigeria. Women who reported that distance to health facilities was not a big problem reported

higher use of antenatal care (76.64%) compared to those who reported distance to health facilities as a problem (66.70%). Highest percentage of antenatal care use was reported among the currently married women (75.12%), followed by formerly married women (66.41%) and then never married urban women (62.50%). This was different from the pattern among the rural women. The differences experienced in the use of antenatal care by marital status may be due to little or no limiting influence of partners as married women may not need to seek permission to go out for such treatment from their husbands in the urban areas (Rahman et al., 2008). Women employment status also revealed a consistently positive relationship with antenatal care use. It was revealed that employed women's percentage of antenatal care use was 78.40% and that of unemployed women was 65.95%. Women who had 1 to 2 living children had the highest use of antenatal care (78.29%), followed by women with 3 to 4 living children (77.70%), women with 4 or more children (65.30%) and the least was women with no living child (55.17%).

Partner's education level also revealed a positively significant association with antenatal care use in the rural areas of Nigeria. Urban women whose partners had higher level of education had the highest use of antenatal care (88.27%), followed by women whose partners had secondary education (83.80%), women whose partners had primary education (73.69%) while women whose partners were illiterate was the least (46.61%). This agrees with Caldwell's opinion that men who had higher level of education make significant contributions to the decision about child care than men without any education (Caldwell, 1990). About 74.54% of urban women used antenatal care. Urban poor women who received antenatal care were 44.65% while urban non-poor women who received antenatal care were 78.52%.

In rural areas of Nigeria, women in the age group 25-34 had the highest percentage of antenatal care use (51.09%), followed by women at age 35+ (45.80%) and then women of age 15-24

(38.66%). South-West women had the highest percentage of antenatal care use (89.28%), followed by women in the South-East region (73.90%), women in the South-South region (62.82%), women in the North-Central region (54.67%), women in the North-East region (33.29%) while women in the North-West region had the lowest use of antenatal care (19.06%). Women's level of education revealed a positive association with the pattern of antenatal care utilization. The more women's level of education increases, the higher their use of antenatal care. Women with primary education recorded antenatal care use of 57.71%.The antenatal care use increased among women with secondary education (76.96%) and even higher percentage was recorded among women who acquired higher level of education (92.94%). Illiterate women reported the lowest use of antenatal care (23.27%). Other Christians apart from Catholics displayed the highest level of antenatal care use (66.76%), followed by Catholic Christians (61.44%), then Muslim women (32.75%) and others, which included traditionalists and adherents of other religions (31.21%). Distance to health facilities was also a major factor determining the use of antenatal care in Nigeria. Women who reported that distance to health facility was not a big problem reported higher use of antenatal care (54.49%), compared to those who reported distance to health facilities as a problem (34.30%). Highest percentage of antenatal care use was reported among the never married women (54.09%), followed by formerly married women (52.27%) and then currently married women (45.95%). Women employment status also revealed a consistently positive relationship with antenatal care use. It was revealed that employed women's percentage of antenatal care use was 52.06% while the percentage of antenatal care use among the unemployed women was 35.88%. Women who had 1 to 2 living children had the highest use of antenatal care (49.54%), followed by women with 3 to 4 living

children (47.92%), then women with 4 or more children (41.05%) while the least consisted of women with no living child (34.55%).

Partner's education level also revealed a positively significant association with antenatal care use in the rural areas of Nigeria. Women whose partners had higher level of education had the highest use of antenatal care (79.79%), followed by women whose partners had secondary education (68.11%), then women whose partners had primary education (53.24%) while women whose partners were illiterate were the least (20.59%). This agrees with Caldwell's opinion that men who had higher level of education have significant contribution to the decision about child care than men without any education (Caldwell, 1990).Urban women use antenatal care more than rural women in Nigeria. About 74.54% of urban women used antenatal care while 36.42% of rural women use antenatal care. Non-poor women use antenatal care more than poor women in Nigeria. About 70.26% of non-poor women use antenatal care while 23.89% of poor women use antenatal care.

Table 3: Frequency distribution of women who have had more than four antenatal care visits by selected demographic and socio-economic characteristics.

Variables	Rural		Urban		All	
	Number	%	Number	%	Number	%
DEMOGRAPHIC VARIABLES						
Age		*		*		*
15-24	1,065	31.31	607	65.76	1,672	38.66
25-34	2,101	39.53	1,728	79.27	3,829	51.09
35+	1,193	36.70	803	72.54	1,996	45.80
Current Marital Status		*		*		*
Never married	153	51.17	65	62.50	218	54.09
Married	4,040	35.70	2,986	75.12	7,026	45.95
Formerly married	166	47.03	87	66.41	253	52.27
Region		*		*		*

North central	1,062	47.16	599	76.21	1,661	54.67
North east	784	26.26	490	58.26	1,274	33.29
North west	496	13.08	348	54.80	844	19.06
South east	490	70.20	365	79.52	855	73.90
South-South	769	57.69	336	78.87	1,105	62.82
South west	758	83.66	1,000	94.07	1,758	89.28
Residence						*
Urban			3,138	74.54	3,138	74.54
Rural	4,359	36.42			4,359	36.42
SOCIO-ECONOMIC VARIABLES						
Women Education		*		*		*
No education	1,315	18.82	584	49.87	1,899	23.27
Primary	1,406	52.07	693	73.96	2,099	57.71
Secondary	1,405	69.59	1,357	86.43	2,762	76.96
Higher	233	89.27	504	94.74	737	92.94
Partner's education		*		*		*
No education	967	16.62	413	46.61	1,380	20.59
Primary	1,148	46.72	577	73.69	1,725	53.24
Secondary	1,518	58.84	1,278	83.80	2,796	68.11
Higher	573	70.31	805	88.27	1,378	79.79
Religion		*		*		*
Catholic	492	52.56	338	81.45	830	61.44
Other Christian	2,183	59.32	1,382	83.25	3,565	66.76
Islam	1,613	22.81	1,386	66.51	2,999	32.75
Others	71	25.45	32	62.75	103	31.21
Wealth Status		*		*		*
Poor	1,772	22.58	221	44.65	1,993	23.89
Non poor	2,587	62.81	2,917	78.52	5,504	70.26
Employment		*				
No	1,190	26.97	862	65.95	2,052	35.88
Yes	3,169	41.94	2,276	78.40	5,445	52.06
Living Children		*		*		*
None	41	30.15	16	55.17	57	34.55
1-2	1,644	38.69	1,255	78.29	2,899	49.54
3-4	1,431	36.64	1,150	77.70	2,581	47.92
5+	1,243	33.80	717	65.30	1,960	41.05
Distance to Health Facility		*		*		*
Big problem	1,646	29.18	595	66.70	2,241	34.30

Not a big problem	2,713	42.88	2,543	76.64	5,256	54.49

*= $p<0.05$

4.3. Summary

The background factors that are associated with antenatal care utilization in urban and rural areas in Nigeria have been identified in this chapter. It has been revealed that in the rural areas, age, region, women education, religion, distance to health facilities, current marital status, employment, number of living children, partner's education, residential status by wealth and wealth status were significantly associated with antenatal care use. In the urban areas, age, region, women education, religion, distance to health facility, current marital status, employment, number of living children, partner's education and wealth status were significantly associated with antenatal care use. In Nigeria, all the variables of the study, except employment, were significantly associated with antenatal care use at 95% level of significance. All the significant background variables were also included in the multivariate analysis.

CHAPTER 5

DETERMINANTS OF URBAN-RURAL DIFFERENTIALS IN ANTENATAL CARE

5.1. Introduction

This chapter reveals the factors that are associated with the urban-rural differentials in antenatal care use. Significant factors at 95% level of significance from the bivariate analysis were included in this model. It reveals the result of logistic regression for receiving antenatal care in the rural and urban areas and Nigeria as a whole.

Table 4 shows the factors that are significantly associated with the urban-rural differentials in the use of antenatal care in Nigeria at 5% level of significance. Binary logistic regression was used to examine the factors that determine rural-urban differentials in women's pattern of antenatal care. Antenatal care was defined in this study as the treatment received for pregnancy by women with one or more live birth five years before the 2008 Nigerian Demographic and Health Survey. Women who received at least four treatments during pregnancy were categorized as "Yes" while women who received less than four antenatal treatments were categorized as "No".

The table also reveals that age, region, women education, religion, distance to health facilities, partner's education, employment status and wealth status are significantly associated with antenatal care use in the rural areas of Nigeria. For urban women, age, region, women education, distance to health facilities, partner's education, living children and wealth status were significantly associated with antenatal care use. In the total model, age, region, women education, religion, distance to health facilities, partner's education, occupation, number of living children, wealth and residence were significantly associated with antenatal care use.

5.2. Determinants of antenatal care utilization in the rural areas

In the rural model, women in age group 25-34 and 35+ were 1.34 and 1.41 times respectively more likely to use antenatal care than women in the age group 15-24. Women in the North-East, North-West, South-East, South-South and South-West regions of Nigeria had 0.17, 0.07, 0.39, 0.16 and 0.23 lower odds respectively in antenatal care use than women in the North-Central region. Mothers with primary, secondary and higher educational attainment were 1.87, 2.63 and 6.29 times respectively more likely to use antenatal care than illiterate mothers. Other Christian women and Muslim women were 1.32 and 1.28 times respectively more likely to use antenatal care than Catholic women, while women practising traditional religion and other unclassified religions were 0.94 times less likely to use antenatal care than Catholic women. Women who did not have problem with distance to health facilities were more likely to use antenatal care than women who had a big problem with distance to health facilities (O.R= 1.60, C.I= 1.45-1.76). Women whose partners had primary, secondary and higher education were 1.91, 1.99 and 2.71 times respectively more likely to use antenatal care than women whose partners were illiterate. Employed women were more likely to use antenatal care than unemployed women (O.R=1.22, C.I=1.10-1.36). Rural non-poor women were more likely to use antenatal care than rural poor women (O.R= 2.34, C.I= 2.10-2.60).

5.3. Determinants of antenatal care utilization in the urban areas

In the urban areas, women in the age group 25-34 and 35+ were 1.62 and 1.50 times respectively more likely to use antenatal care than women in the age group 15-24. Women in the North-East, North-West, South-East, South-South and North-Central had 0.25, 0.16, 0.39, 0.28 and 0.31 lower odds respectively in antenatal care use than women in the South-west region. Women who

had primary, secondary and tertiary education were 1.59, 2.68 and 5.14 times respectively more likely to use antenatal care than illiterate women. Women who did not have a big problem with seeking medical help for herself, due to distance to health facilities, were more likely to use antenatal care than women who had a big problem with seeking medical help for herself due to distance to health facilities (O.R=1.36. C.I= 1.12-1.65). Women whose partners had primary, secondary and higher education were 1.58, 2.01 and 2.51 times more likely to use antenatal care than women whose partners were illiterate. Urban women who had 1-2 and 3-4 living children were 2.97 and 2.76 times respectively more likely to use antenatal care than women who had no living child. Urban non-poor women were more likely to use antenatal care than urban poor women (O.R= 1.75, C.I=1.40-2.19).

5.4. Overall determinants of antenatal care utilization

In the total model that combines both rural and urban areas of Nigeria, women in the age group between 25-34 and 35+ were 1.37 and 1.40 times respectively more likely to use antenatal care than women in age group 15-24. Women in the North-East, North-West, South-East, South-South and North-Central had 0.20, 0.09, 0.40, 0.19 and 0.26 lower odds respectively in antenatal care use than women in the South-West region. Women who had primary, secondary and tertiary education were 1.81, 2.62 and 5.34 times respectively more likely to use antenatal care than illiterate women. Non- Catholic Christian women and Muslim women were 1.21 and 1.24 times respectively more likely to use antenatal care than Catholic women. Women who did not have a big problem with seeking medical help for themselves due to distance from health facilities were more likely to use antenatal care than women who had a big problem with seeking medical help for themselves due to distance from health facilities (O.R=1.55. C.I= 1.42-1.69). Women whose partners had primary, secondary and higher education were 1.84, 2.03 and 2.75

times more likely to use antenatal care than women whose partners were illiterate. Employed women were more likely to use antenatal care than unemployed women (O.R=1.21, C.I=1.11-1.32). Women who had 1-2 living children were 1.61 times more likely to use antenatal care than women who had no living child. Non-poor women were more likely to use antenatal care than poor women (O.R= 2.28, C.I=2.07-2.50). It was revealed that rural women were less likely to use antenatal care than urban women (O.R= 0.53, C.I= 0.48-0.59).

Table 4: Urban, rural and national demographic and socio-economic determinants of antenatal care use in Nigeria

Variables	Rural Odds Ratio (95% C.I)	Urban Odds Ratio (95% C.I)	All Odds Ratio (95% C.I)
DEMOGRAPHIC VARIABLES			
Age			
15-24	1.00	1.00	1.00
25-34	1.34* (1.17-1.53)	1.62* (1.29-2.04)	1.37* (1.22-1.54)
35+	1.41* (1.19-1.68)	1.50* (1.12-2.01)	1.40* (1.21-1.62)
Current Marital Status			
Never married	1.00	1.00	1.00
Married	0.93 (0.72-1.20)	1.22 (0.80-1.86)	0.97 (0.78-1.21)
Formerly married			
Region			
South west	1.00	1.00	1.00
North east	0.17* (0.14-0.21)	0.25* (0.17-0.35)	0.20* (0.16-0.24)
North west	0.07* (0.05-0.08)	0.16* (0.11-0.23)	0.09* (0.07-0.10)
South east	0.39* (0.30-0.52)	0.39* (0.26-0.59)	0.40* (0.32-0.50)
South –South	0.16* (0.13-0.20)	0.28* (0.19-0.41)	0.19* (0.16-0.24)
North central	0.23* (0.19-0.29)	0.31* (0.22-0.43)	0.26* (0.22-0.31)

Residence			
Urban	1.00	1.00	1.00
Rural			0.53* (0.48-0.59)
SOCIO-ECONOMIC VARIABLES			
Women Education			
No education	1.00	1.00	1.00
Primary	1.87* (1.65-2.13)	1.59* (1.27-2.01)	1.81* (1.61-2.02)
Secondary	2.63* (2.23-3.11)	2.68* (2.06-3.50)	2.62* (2.28-3.01)
Higher	6.29* (3.96-10.01)	5.14* (3.19-8.28)	5.34* (3.86-7.40)
Partner's education			
No education	1.00	1.00	1.00
Primary	1.91* (1.67-2.18)	1.58* (1.23-2.03)	1.84* (1.64-2.07)
Secondary	1.99* (1.72-2.30)	2.01* (1.58-2.57)	2.03* (1.79-2.29)
Higher	2.71* (2.20-3.34)	2.51* (1.86-3.37)	2.75* (2.32-3.26)
Religion			
Catholic	1.00	1.00	1.00
Other Christian	1.32* (1.11-1.58)	0.92 (0.66-1.29)	1.21* (1.04-1.42)
Islam	1.28* (1.05-1.56)	1.20 (0.82-1.75)	1.24* (1.04-1.48)
Others	0.94 (0.67-1.34)	1.02 (0.51-2.03)	0.96 (0.71-1.31)
Wealth Status			
Poor	1.00	1.00	1.00
Non poor	2.34* (2.10-2.60)	1.75* (1.40-2.19)	2.28* (2.07-2,50)
Employment			
No	1.00	1.00	1.00
Yes	1.22* (1.10-1.36)	1.18 (0.99-1.41)	1.21* (1.11-1.32)
Living Children			
None	1.00	1.00	1.00

1-2	1.32 (0.81-2.17)	2.97* (1.19-7.40)	1.61* (1.03-2.52)
3-4	1.09 (0.66-1.80)	2.76* (1.11-6.89)	1.39 (0.89-2.17)
5+	1.06 (0.64-1.75)	2.17 (0.86-5.47)	1.30 (0.82-2.04)
Distance to Health Facility			
Big problem	1.00	1.00	1.00
Not a big problem	1.60* (1.45-1.76)	1.36* (1.12-1.65)	1.55* (1.42-1.69)

*= $p<0.05$

5.5. Likelihood ratio test result (lrtest): according to the institute for research and education (Idre) the likelihood ratio test is used to examine if the removal of one or more variables from the model would harm the fit of the model (IDRE 2013). It is on this note that this test was conducted in this study to examine if removing the variables that were not significantly associated with antenatal care utilization in the logistic regression analysis of each model of the study would harm the model or not. Null hypothesis states that: removing the insignificant variables from the models would not harm the fit of the model while the alternative hypothesis states that removing the insignificant variables from the model would harm the fit of the model. Thus, we are able to know the best model for the study at $p< 5\%$.

In the rural areas, the first model excluded marital status and number of living children but it was included alongside age, region, women education, religion, distance to health facility, partner education, employment status and wealth status in the second model. The likelihood ratio test result was 11.48 with the probability of 0.0216. Therefore, we reject the null hypothesis and conclude that removing the insignificant variables from the model would harm the fit of the model. Therefore, the logistic results revealed for the rural area in table 4 was not the best model for the study.

In the urban area, the first model excluded religion, employment status and marital status but it was included alongside age, region, women education, distance to health facility, partner education, number of living children and wealth status in the second model. The likelihood ratio test result was 8.29 with the probability of 0.1408. Therefore, we fail to reject the null hypothesis and conclude that removing the insignificant variables from the model would not harm the fit of the model. Therefore, the logistic results revealed for the urban area in table 4 was the best model for the study.

However in the total population, the first model excluded marital status but it was included alongside age, region, women education, religion, distance to health facility, partner education, employment status, number of living children, wealth status and residence in the second model. The likelihood ratio test result was 0.07 with the probability of 0.7901. Therefore, we fail to reject the null hypothesis and conclude that removing the insignificant variables from the model would not harm the fit of the model. Therefore, the logistic results revealed for the total population in table 4 was the best model for the study.

5.6. Summary

This study reveals differences in the determinants of antenatal care utilization between rural and urban women at a significance level of less than 5%. Religion and occupation were significantly associated with antenatal care use in the rural area at $p<0.05$, but not significantly associated with antenatal care use at $p<0.005$ in the urban area. Whereas the number of living children was significantly associated with antenatal care use in the urban area at $p<0.05$, the data revealed no association in the rural area. Therefore, religion, occupation and the number of living children

reveal the difference in determining antenatal care use between the rural and the urban women at 5% level of significance.

5.7. Hypothesis testing result:

Ho: There is no determinant of the differences in antenatal care utilization between the rural and the urban women.

Hi: There is a determinant of the differences in antenatal care utilization between the rural women and the urban women.

This hypothesis was generated to examine if any demographic or socio-economic variable would explain the urban-rural differentials in antenatal care utilization in Nigeria. Thus, as stated above, in the summary, the findings revealed the determinants of the differences in antenatal care utilization between rural and urban women at a significance level of less than 5%. Religion and occupation were significantly associated with antenatal care use in the rural area at $p<0.05$, but not significantly associated with antenatal care use at $p<0.005$ in the urban area. Similarly, the number of living children was significantly associated with antenatal care use in the urban area at $p<0.05$, but revealed no association in the rural area. Therefore, religion, occupation and the number of living children revealed the difference in the determinant of antenatal care use between the rural and urban women at 5% level of significance. Thus, we conclude that there is a determinant of the differences in antenatal care utilization between the rural women and the urban women in Nigeria.

CHAPTER 6

DISCUSSION, CONCLUSION AND RECOMMENDATION

6.1. Discussion

The study objective was to identify the determinants of urban-rural differentials of antenatal care use in Nigeria. It specifically described the distribution of antenatal care utilization among the rural and urban women in Nigeria and also determined the factors that are associated with urban-rural differential in Antenatal Care (ANC) use in Nigeria.

This study classified antenatal care users as women who have had at least four antenatal care visits for their pregnancies. This classification was based on the World Health Organization's recommendation of a new model of antenatal care for women without complicated pregnancies in developing countries, which include at least four antenatal care visits with compulsory measurement of blood pressure, urine and blood tests, as well as optional weight and height measurement at each visit (WHO and UNICEF, 2003; NPC and ICF Macro, 2009). The study revealed a difference in the pattern of antenatal care use between the rural and the urban women. There was a higher percentage of antenatal care use among the urban women than among rural women. More than 74% of antenatal care use occurred in the urban areas of Nigeria while only about 36% was experienced in the rural areas.

The study showed that rural women were less likely to use antenatal care than urban women. This agrees with the finding that urban women use antenatal care more than rural women in Nigeria (Dairo and Owoyokun, 2010). It thus disagrees with the finding that urban residents had no association with the use of antenatal care (Eggleston 2000). Several factors were identified as

the determinants of this urban- rural difference in the pattern of antenatal care use in Nigeria. In rural areas, antenatal care use was determined by the following factors: age, region, women education, religion, distance from health facilities, partner's education, employment status and wealth status. This contradicts the finding that only women education and partner's education were significantly associated with antenatal care use in the rural areas of Nigeria (Kabir et al., 2005). However, antenatal care use in the urban areas was significantly determined by age, region, women education, distance to health facilities, partner's education, living children and wealth status. The determinants of antenatal care that revealed rural-urban differentials are religion, occupation and the number of living children. Religion and occupation determined antenatal care use in the rural areas but showed no association with antenatal care use in the urban areas. Number of living children was significantly associated with antenatal care use in the urban areas but revealed no association with antenatal care use in the rural areas of Nigeria.

It was revealed in the study that urban and the rural non-poor women were more likely to use antenatal care than the urban and rural poor women. Consequently, the urban poor women were more disadvantaged, compared to the urban non-poor women in the use of antenatal care as they did not benefit from being in the urban areas of the country. This is similar to the previous findings that the urban poor tend to be worse off than rural residents and the urban non-poor in the utilization of maternal healthcare services (Monica et al., 2003, Fosto et al. 2007). It also agrees with the findings that women in the middle and rich class were more likely to use antenatal care than poor women (Iyaniwura and Yusuf, 2010).

Furthermore, partner's and women's education was positively associated with the use of antenatal care in both rural and urban areas of Nigeria. These variables reflect the most significant association with antenatal care use in both rural and urban areas of Nigeria. It

revealed that women's use of antenatal care increased as their educational attainment and that of their partners increased from primary to secondary and higher levels. Similarly, Rahman et al. (2008) found a positive association between women and partner's education and antenatal care use. Results revealed that the higher the educational attainment of women and husbands, the more women tend to use antenatal care.

Similarly, women whose partners had higher level of education had the highest use of antenatal care (70.31%), followed by women whose partners had secondary education (58.84%), then women whose partners had primary education (46.72%) while women whose partners were illiterates were the least (16.62%). This agrees with Caldwell's opinion that men who had higher levels of education make significant contributions to the decision about child care than men without any education (Caldwell, 1990).

In the same vein, the percentage of men with no education (42.49%) was lower than their female counterparts (50.43%) and the percentage of men with higher education (10.95%) were higher than that of their female counterparts (4.90%). This is reflective of the differential in educational attainment by sex, as more educational priority may be given to the male than the female in most families in Nigeria. The World Health Organization gave a standard pattern of antenatal care utilization for women who did not experience complicated pregnancy in sub-Sahara Africa. It was stated that they should receive at least four antenatal care visits, which would include compulsory blood pressure measurement, urine and blood tests and non-compulsory weight and height check at each visit (WHO and UNICEF, 2003; NPC and ICF Macro, 2009).

Distance from health facilities was also significantly associated with antenatal care use in both the rural and urban areas of Nigeria. Women who had problem with reaching health facilities

were less likely to use antenatal care than women who did not have problem with distance from health facilities. This conforms to the findings that shorter walk time to health facilities was associated with antenatal care use in Sudan (Ibnouf et al., 2007). In addition, rural and urban women in the North-East, the North-West, the South-East, the South-South and the South-West region were less likely to use antenatal care than women in the North-Central region. This is similar to the findings that revealed that region is associated with antenatal care use in Bangladesh (Rahman et al., 2008).

However, religion was significantly associated with antenatal care use in the rural areas but showed no association in the urban areas of Nigeria. Non-Catholic Christians and Muslim women were more likely to use antenatal care in the rural areas than Catholic women. This is similar to the finding that revealed association between religion and antenatal care in Nigeria (Dairo and Owoyokun, 2010). Women employment status was also associated with antenatal care use in the rural areas but not associated with it in the urban areas. Employed women were more likely to use antenatal care than unemployed women. Rahman et al. (2008) also revealed an association between employment status and antenatal care use in Bangladesh. In the urban areas, the number of living children was associated with antenatal care use but showed no association in the rural areas at 5% level of significance. This is similar to the finding that birth order was significantly associated with antenatal care use in Uttarakhand (Digambar et al., 2011).

6.2. Conclusion:

Differences in patterns of antenatal care utilization had been identified in this study. Urban women were revealed to use antenatal care more than the rural women. Also, rural poor and urban poor women also had a low percentage of antenatal care use, compared to urban non-poor

and rural non-poor women. Thus, poverty and residence have been identified as major determinants of differential in antenatal care use in Nigeria.

In addition, the factors that were significantly associated with the low use of antenatal care in the rural areas were: age, region, women education, religion, distance from health facilities, partner's education, employment status and wealth status. While age, region, women education, distance from health facilities, partner's education, living children, and wealth status were the significant determinants of use in the urban areas. Other variables, except employment, were associated with antenatal care use in both the rural and urban areas of Nigeria.

However, religion, women employment status and the number of living children were the most significant determinants of the urban-rural differentials in antenatal care use in Nigeria. This is because religion and women's employment status were associated with antenatal care use in rural areas only while the numbers of living children were associated with antenatal care use in the urban areas only.

This study revealed that the urban poor women, as well as the rural poor, were more disadvantaged in the use of antenatal care. Thus, public health intervention programmes should be targeted towards improving the pattern of antenatal care use among the urban and the rural poor women in Nigeria. Furthermore, this study shows that women and partner's education were significantly associated with antenatal care use in rural and urban areas. Therefore, in order to improve the antenatal care use among the urban-poor women, it is advisable for Nigerian government to encourage increased levels of education among the urban poor men and women. This would help improve the use of antenatal care among the urban poor women. Consequently,

it would reduce maternal and child mortality that is caused by complications during pregnancy, which results from low use of antenatal care in Nigeria.

The result observed from the study revealed more use of antenatal care in the urban areas, compared to the rural areas. Consequently, factors such as women's education, partner's education, employment, distance from health facilities, religion, region and age showed significant association with antenatal care use in the rural areas and these issues should be addressed by public health workers in order to bridge the gap between the rural and urban use of antenatal care in Nigeria.

Furthermore, it was revealed in the study that religion and women employment was associated with antenatal care use in the rural areas but not associated with antenatal care use in the urban areas. Thus, to achieve improved use of antenatal care in the rural areas, programmes that would make women to be gainfully employed should be implemented by the government. That is, job opportunities should be increased in the rural areas to ensure increased use of antenatal care in the rural areas of Nigeria. Also, Christian and Islamic religious organizations should continue to encourage their members that are still not using antenatal care to use it, as these religious organizations can play a major role in promoting antenatal care use in Nigeria. The number of living children was associated with antenatal care use in the urban areas but not associated with it in the rural areas. It was revealed that women who had 1-2 children were 1.61 times more likely to use antenatal care than women who had no living children. Thus, public health programmes that promote child survival should be encouraged in the urban areas to improve the use of antenatal care in the urban areas of Nigeria.

6.3. Recommendations:

This study recommends that public health intervention programmes and government efforts should be targeted at addressing the differences in the determinants of antenatal care use in the rural and urban areas of Nigeria in order to increase antenatal care use in Nigeria and consequently reduce maternal, neonatal and child mortality in Nigeria. Thus, job creation programmes for women in the rural areas, as well as intervention programmes that would involve the religious organizations in the rural areas, could help increase antenatal care use in the rural areas and the health outcomes of the rural people would subsequently improve.

In the urban areas, public health programmes should be targeted at improving the survival of children, as this would encourage women to use antenatal care in the urban areas. Such programmes like the safe motherhood initiative should be encouraged in urban Nigeria. After-birth services for children, such as immunization, should be promoted in the urban areas so as to encourage women in the urban areas to use antenatal care for their subsequent pregnancies.

Furthermore, the determinants of antenatal care use in the rural and urban areas should be targeted by policy makers, public health workers and government agencies to promote antenatal care use in Nigeria. Consequently, the issue of poverty should be addressed, both in the rural and urban areas of Nigeria in order to increase antenatal care use in Nigeria. This can be achieved in the rural areas through job creation. Job creation was recommended as a solution because women employment status also revealed an association with antenatal care use in Nigeria. The government of Nigeria can encourage foreign investors to establish their firms and factories in the rural areas of Nigeria to ensure the employment of the rural residents. Gainful employment of

rural women would enable women to afford transport cost to health facilities as distance to health facilities poses a major challenge to women in seeking antenatal care.

However, to achieve the aim of gainfully employing women in the rural areas, more importance should be attached to the education of women. Government must set a goal of educating adult women and female children and this should be facilitated through the provision of education scholarships for adult women and female children in the rural areas of Nigeria. This is because the study revealed a positive and significant association between higher education and antenatal care in the rural areas. Also, husbands of rural women should be encouraged to increase their educational status, since the more educated husbands become, the more their wives use antenatal care for pregnancy. It is important that public health workers should involve men in decisions that have to do with promoting the health service utilization of women in the rural areas. Thus, public health programmes that are targeted at educating women about antenatal care should also involve men in the rural areas. Rural women in the North-East, the North-West, the South-East, the South-South and the North-Central region should be educated on the need to use antenatal care effectively to prevent complications during the period of pregnancy.

However, in the urban areas of Nigeria, the approach that government agencies, policy makers and public health interventionists would use to improve antenatal care use is different from that of the rural areas based on the significant determinants of antenatal care use in the urban areas of Nigeria. Wealth status was also associated with antenatal care use in the urban areas. It also revealed that the urban non-poor are more likely to use antenatal care, compared to the urban poor. Thus, public health programmes that would promote the use of antenatal care in the urban areas should be targeted at the urban poor women. Also, women education to the tertiary level should be promoted by the government in the urban areas, because women education revealed a

positive significant association with antenatal care in the urban areas. The study also showed that highly educated men in the urban areas are more likely to encourage their wives to use antenatal care. This suggests to the public health workers that men should also be involved in decisions that have to do with promoting the health service utilization of women in the urban areas. In addition, the attainment of higher levels of education would probably increase the level of income of the family and encourage women to use expensive and better healthcare services in the urban areas. The level of education would also enlighten partners as regards the importance of antenatal care services for their pregnant wives, thus making them encourage their wives to use antenatal care during pregnancy.

Moreover, the rural urban disparity in antenatal care in Nigeria can also be solved by addressing the factors that are responsible for the low use of antenatal care in the rural areas of Nigeria, as it was revealed in the total model that urban women used antenatal care more than rural women. Thus, public health intervention that would increase antenatal care use should be targeted more at the rural residents than the urban residents. The intervention programme should address the improvement of the levels of education of women and that of their partners in Nigeria. This is because women and their partners' education revealed a positive relationship with women's use of antenatal care in Nigeria. This could increase their chance of becoming gainfully employed, thus improving their income and giving them the financial means to transport themselves to distant health facilities. In addition, education would also enlighten both men and women about the importance of antenatal care and would make other intervention programmes by health personnel to be easily accepted by the rural and urban residents.

Multilevel studies should be done to address the community and State influences on antenatal care use in Nigeria. The logistic regression analysis done in this study was only able to examine

the factors associated with urban-rural differentials in antenatal care utilization at the individual levels. Therefore, findings from such multilevel study would help provide insights into the community and State level factors that contribute to the urban-rural differences in the utilization of antenatal care in Nigeria.

In addition, qualitative studies such as focus group discussions could be used to examine the cultural factors, such as beliefs systems and husband's autocratic behaviours as a result of the Nigeria's patriarchal systems, that are associated with the urban-rural differences in antenatal care utilization in Nigeria. Such studies would explore other aspects of the Andersen framework of health utilization such as community determinants, belief systems and illness level determinants that was not addressed in this study. Also, a trend analysis could also be done to compare the determinants of urban-rural differentials in antenatal care use in Nigeria over a period of time. For instance, the determinants of the urban-rural differentials of antenatal care use in Nigeria in 1999 can be compared with the determinants of the differentials of antenatal care use in 2003 and 2008 respectively. This would revealed if there had been any changes overtime in the factors that are associated with the differentials in the use of antenatal care in the rural and urban areas of Nigeria.

Future studies should consider re-categorizing the dependent variables into three such as: no antenatal visit, less than four antenatal visits, and more than four antenatal visits. This would reveal whether there are any urban-rural differences in the pattern of antenatal care utilization between those who have never visited and those who visited but did not have up to four visits to clinics providing antenatal care in line with the recommendation of the World Health Organization for any uncomplicated pregnancy. In addition, the checks that should be done during antenatal care visits such as blood pressure and urine tests should also be investigated

alongside the number of antenatal care visits the women make to clinics during the period of pregnancy. This would reveal the determinants of urban-rural differentials of the World Health Organization's recommended antenatal care visits in Nigeria.

In conclusion, age, region, women education, religion, distance from health facilities, partner's education, occupation, number of living children, wealth and residence should be addressed by any public health intervention that seeks to promote antenatal care use in Nigeria. This is because this study revealed a significant association between antenatal care and age, region, women education, religion, distance to health facilities, partner's education, occupation, number of living children, wealth and residence. However, if the recommendations given in this study are implemented there should be an improvement in the level of antenatal care use in the rural and urban areas of Nigeria, as well as in Nigeria as a whole. Specifically, the urban poor and the rural poor would increase their level of antenatal care use and thus reduce the high incidence of maternal and neonatal death in Nigeria, which results from poor use of antenatal care. This is because the possible solutions to the problem of low use of antenatal care in the rural areas, when compared to the urban areas of Nigeria, as well as among the poor in both rural and urban Nigeria, has been provided by the recommendations from this study.

6.4. Limitations of the study:

This study is limited in its inability to predict the causal determinants of the differentials in the pattern of antenatal care utilization among urban women, compared to the rural women in Nigeria. We cannot conclude that the independent variables (determinants of urban-rural differentials) are the causes of the dependent variable (antenatal care use) in a cross-sectional study. Other studies such as cohort or case control study, for example, can be conducted to

investigate the causal- effect relationship between the socio-demographic and health factors that may be associated with the differentials in the pattern of antenatal care utilization between urban poor and rural women in Nigeria (Tran et al., 2011). Since this limitation could not be controlled in this study, an association test between the background variables and antenatal care was done using multivariate logistic regression, which revealed the possible determinants of urban-rural differentials of antenatal care utilization controlling for confounding variables.

Certain qualitative questions that should explore salient factors associated with rural-urban differentials in antenatal care utilization pattern are not captured in this study. This is because the cross-sectional data used for analysis in this study did not ask such qualitative questions during survey. For instance, questions such as cultural practices like male dominance, which disallow women from using antenatal services, were not asked in the Nigeria Demographic and Health Survey used for this study. However, socio-economic variables such as religion, which could be related to culture, were used.

In addition, changes in health outcomes cannot be captured by a cross-sectional data but a panel study. This, therefore, creates potential for endogeneity (due to the omission of possible associated determinants from the analysis) in this study, thereby causing a limitation in the study (Rob and Amy, 2002). Therefore, panel studies could be conducted on this topic in future.

Furthermore, the use of secondary data constrained the researcher to use the available questions and responses provided in the NDHS data, which did not specifically address the research questions of this study, unlike if the researcher had developed the questionnaire personally. For instance, the NDHS question on antenatal care use did not take into consideration the World Health Organization recommendation of at least four antenatal care visits, with compulsory

blood pressure check, urine and blood tests and non-compulsory weight and height check at each visit for any uncomplicated pregnancy (WHO and UNICEF, 2003). Thus, to agree with this recommendation of the WHO in this study, the responses on antenatal care was re-categorized and merged to give a binary response. However, other parts of the definition such as the compulsory blood pressure check, urine and blood tests and non-compulsory weight and height check were not examined in this study. Thus, if the researcher had personally designed the questionnaire, this limitation would have been avoided and adequately taken into consideration.

REFERENCES

Aboyeji A. P, Ijaiya M. A and Fawole A. A. 2007.Maternal Mortality in a Nigerian Teaching Hospital – a Continuing Tragedy.**Tropical Doctor**. 37: 83-85.

Adam T, Lim S. S, Mehta S, Bhutta Z. A, Fogstad H, Mathai M, Zupan J, and Darmstadt G. L. 2005. Cost effectiveness Analysis of Strategies for Maternal and Neonatal Health in developing Countries. **BMI**. 331 (7525): 1107. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

Adamu Y. M and Salihu H. M. 2002. Barriers to the Use of Antenatal and Obstetric Care Services in Rural Kano, Nigeria. **Journal of Obstetric Gynaecology**. 22 (6): 600-603. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

Adamu Y. M, Salihu H. M, Sathiakumar N and Alexander G. R (2003). Maternal Mortality in Northern Nigeria: A population-based Study. **European Journal of Obstetric, Gynecology and Reproductive Biology**. 109:153-159. InShiffman J and Okonofua F. E. 2007. The State of Political Priority for Safe Motherhood in Nigeria.**BJOG**.114: 127-133.

Alexandre P. K, Saint-Jean G, Crandall L and Pierre K. A. 2005.Prenatal Care Utilization in Rural Areas and Urban Areas of Haiti.**Rev PanamSaludPublica**. 18 (2): 84-92.

Andersen R. M. and Newman J. 2005.Societal and Individual Determinants of Medical Care Utilization in the United States.**Milbank Memorial Fund Quarterly**. 83 (4) :95-193.

Anya S. E, Hydara A, Jaiteh L. E. 2008. Antenatal care in The Gambia: missed opportunity for information, education and communication. **BMC Pregnancy and Childbirth**.8:9.

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

Bankole A, Sedgh G, Okonufua F, Inarhugbe C, Hussain R and Wuld D. 2009. **Barriers to Safe Motherhood in Nigeria**.Guttmacher Institute, Newyork.

Bloom S. S, Wypij D and Gupta M. D. 2001. **Dimensions of Women's Autonomy and the Influence on Maternal Health Care Utilization in a North Indian City**.

Bradley, J. Stephens, C. Harpham, T. and Cairncross, S. 1992. A Review of Environmental Health Impact in Developing Country Cities.Washington D.C. Urban Management Program. Urban Management and the Environments, The world Bank. In Harpham, T. and Catherine, M. 2001. Urban Health in Developing Countries: a Review. **Progress in Development Studies.** 1 (2): 113-137.

Caldwell, J. C. (1990). **Cultural and Social Factors Influencing Mortality in Developing Countries in L.D.Cs.** Paper Presented to IUUSP Conference on Women's Position and Demographic Change in the Course of Development, Oslo. In Rahman M, Islam R and Islam A. Z. 2008. Rural-urban Differentials of Utilization of Antenatal Health-care Services in Bangladesh. **Health Policy and Development Journal**. 6 (3): 117-125.

Celik Y. 2000. The Socio-economic Determinants of Alternative Sources of Antenatal Care in Turkey. **International Journal of Health and Planning Management**. 15 (3): 221-235. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

CIA World Factbook (2012).Population Country Comparison.www.indexmundi.com. Information retrieved 28/04/2013.

Dairo M. D. and Owoyokun K. E. (2010). Factors affecting the utilization of antenatal care services in Ibadan, Nigeria. **Benin Journal of Postgraduate Medicine**.12(1).

Daniel Wiechmann (2013). Multivariate Analysis Technique.Retrieved from www.daniel-wiechmann.eu. Information retrieved 12/06/2013.

Digambar A. C. and Harihar S. 2011. Factors Influencing the Utilization of Maternal Health Care Services in Uttarakhand. **Ethnographic Medicine**. 5 (3): 209-216.

Eggleston E. 2000. Unintended Pregnancy and Women's Use of Prenatal Care in Ecuador.**Social Science and Medicine**. 51: 1011-1018.

Fatmi Z and Avan B. I. 2002.Demographic, Socio-economic and Environmental Determinants of Utilization of Antenatal Care in Rural Setting of Sindh, Pakistan.**Journal of Pakistan Medical Association**. 52 (4): 138-142. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

Federal Government of Nigeria (FGN). 1988. **National Policy on Population for Development, Unity, Progress and Self-reliance**. In Ibisomi LDG. 2007. Analysis of Fertility Dynamics in Nigeria: Exploration into Fertility Preference Implementation. PhD. Thesis submitted to the University of the Witwatersrand, Johannesburg, South Africa.

Forreit, Karen, Mahesh Kerra and TanviPandit-Rajani. 2010. **Disentangling the Effect of Poverty and Place of Residence for Strategic Planning**. Washington, D.C. Future Groups, Health Policy Initiative, Task Order 1.

Fortney J. A. Editor's Comment. 2005. International Journal of Gynaecology Obstetric. 88: 179-180.In Shiffman J and Okonofua F. E. 2007.The State of Political Priority for Safe Motherhood in Nigeria.**BJOG**.114: 127- 133.

Fotso J. C, Ezeh A, Oronje R. 2008. Provision and use of maternal health services among urban poor women in Kenya: what do we know and what can we do? **Journal of Urban Health**. 85(3):428-42.

Graham W. J. 2002. Now or Never: The Case for Measuring Maternal Mortality. **Lancet**.359: 701- 704.In Shiffman J and Okonofua F. E. 2007.The State of Political Priority for Safe Motherhood in Nigeria.**BJOG**.114: 127- 133.

Harpham, T. 2009. Urban Health in Developing Countries: what do we do and where do we go? **Health and Place**. 15: 107-116.

Harpham, T. and Catherine, M. 2001. Urban Health in Developing Countries: a Review. **Progress in Development Studies**. 1 (2): 113-137.

Helen Chapin Metz, ed. 1991. **Nigeria: A Country Study**. Washington: GPO for the Library of the Congress.

Henry V. D. 2011. Intergenerational differences in antenatal care and supervised deliveries in Nigeria.**Health and Place**. 17: 480-489.

Ibnouf A. H, van den Borne H. W and Maarse J. A. 2007. Utilization of Antenatal Care Services by Sudanese Women in their Reproductive Age.**Saudi Medical Journal**. 28 (5): 737-743.

Iyaniwura C. A. and Yusuf Q. (2009).Utilization of Antenatal Care and delivery services in Sagamu, south western Nigeria.**African Journal of Reproductive Health**. 13 (3): 111-122.

Kabir M., Iluyasu Z., Abubakar I. S., and Sani A. A. (2005).Determinants of Utilization of Antenatal Care Services in Kumbotso village, northern Nigeria. **Tropical Doctor**. 35(2): 110-111.

Khan K. S, Wojdyla D, Say L, Gulmezoglu A. M and Van Look P. F. A. 2006. World Health Organization Analysis of Causes of Maternal Death: A Systematic Review. **Lancet.**367: 1066- 1074.In Shiffman J and Okonofua F. E. 2007.The State of Political Priority for Safe Motherhood in Nigeria.**BJOG**.114: 127- 133.

Laishram, L. and Singh C. H. 2007.Rich-Poor Gap in Maternal Care.**Asian Population Studies**. 3 (1): 79-94.

Londono, L. and Frenk, J. 1997. Structured Pluralism towards an innovative model for health system reform in Latin America.**Health Policy**. 4 (1): 1-36. In Harpham, T. and

Catherine, M. 2001. Urban Health in Developing Countries: a Review. **Progress in Development Studies**. 1 (2): 113-137.

Marcellyn B. and Babatunji O. 2012. Nigeria's Public Health: Gains and Challenges. **Equilibri**.

McCarthy J. and Maine D. 1992.A framework for analysing the determinants of maternal mortality.**Studies in Family Planning**. 23: 23- 33. In Nisar, N. and White, E. 2003. Factors affecting Utilization of Antenatal Care among Reproductive Age Group Women (15-49 years) in Urban Squatter Settlement of Karachi. **JPMA**.53 (47).

McGranahan, G. Songsore, J. and Kjellen, M. 1999. Sustainability, Poverty and Urban Environmental Transitions.**London earthscan**. 107-390. InHarpham, T. and Catherine, M. 2001. Urban Health in Developing Countries: a Review. **Progress in Development Studies**. 1 (2): 113-137.

Monica, A. M. Eliya, M. Z. Martin, B. 2003. The Inequality of Maternal Health Care in Urban sub-Saharan Africa in the 1990s. **Population Studies**. 57(3): 347-366.

Mrisho M, Obrist B, Schellenberg J. A, Haws R.A, Mushi A. K, Mshinda H, Tanner M and Schellenberg D. 2009. The use of antenatal and postnatal care: perspectives and experiences of women and health care providers in rural southern Tanzania. **BMC Pregnancy and Childbirth**. 9:10.

National Population Commission (NPC) (Nigeria) and ORC Macro. 2009. **Nigeria Demographic and Health Survey**, Calverton, Maryland. NPC and ORC Macro.

Navaneetham K, Dharmalingam A. 2002. Utilization of maternal health care services in Southern India.**Social Science and Medicine**. 55: 1848-1869.

Nisar, N. and White, E. 2003. Factors affecting Utilization of Antenatal Care among Reproductive Age Group Women (15-49 years) in Urban Squatter Settlement of Karachi. **JPMA**.53 (47).

Nwakoby, B. N. 1994. Use of Obstetric Services in Rural Nigeria.**Journal of Reproductive and Society Health**. 114: 132-136.

Okafor, C. B. 1991. Availability and Use of Services for Maternal and Child Health Care in Rural Nigeria.**International Journal of Gynaecology and Obstetrics**. 34: 331-346.

Osubor, K. M. Fatusi, A. O. Chiwuzie, J. C. 2006. Maternal Health-Seeking Behaviour and Associated Factors in a Rural Nigerian Community.**Journal of Maternal and Child Health**. 10: 159-169.

Palaniappan B. 1995. Role of Antenatal Care in Safe Motherhood.**Journal of Indian Medical Association**.93: 52- 54.In Nisar, N. and White, E. 2003. Factors affecting Utilization of Antenatal Care among Reproductive Age Group Women (15-49 years) in Urban Squatter Settlement of Karachi. **JPMA**.53 (47).

Rahman M, Haque S. E, Mostofa M. G, Tarivond L and Shuaib M. 2011. Wealth Inequality and Utilization of Reproductive Health Services in the Republic of Vanuatu: Insights from the Multiple Indicator Cluster Survey, 2007. **International Journal for Equity in Health**. 10: 58.

Rahman M, Islam R and Islam A. Z. 2008. Rural-urban Differentials of Utilization of Antenatal Health-care Services in Bangladesh. **Health Policy and Development Journal**. 6 (3): 117-125.

Reddy, J. P. 1984. Differential Contraceptive Use among the Slum and Non-slum Dwellers: A study of Hyderabad City. **Health and Population Perspectives and Issues**. 7 (2): 115-128.

Regassa N. Antenatal and postnatal care service utilization in southern Ethiopia (2011): a population-based study. **African Health Sciences**. 11(3): 390 – 397

Rob, S. and Amy, O. T. 2002.Contextual Influences on Reproductive Health Service Use in Uttar Pradesh, India.**Studies in Family Planning**. 33 (4): 309-320.

Royston, E. and S. Armstrong. 1989. **Preventing Maternal Deaths**. Geneva: World Health Organization. In Wall L. L, 1998. Dead Mothers and Injured Wives: The Social Context of Maternal Morbidity and Mortality among the Hausa of Northern Nigeria. **Studies in Family Planning**. 29 (4): 341-359.

Saifuddin, A. and Mosley, W. H. 2002. Simultaneity in the Use of Maternal-Child Health care and Contraceptives: Evidence from Developing Countries. **Demography** 39 (1): 75-93.

Say L and Raine R. 2007. A systematic Review of Inequalities in the Use of Maternal Health Care in Developing Countries: examining the Scale of the Problem and the Importance of Context. **Bull World Health Organization**. 85 (10): 812-819. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

Shehu D. J. 1999.Community Participation and Mobilization in the Prevention of Maternal Mortality in Kebbi, North-western Nigeria.In Berere, Marge and SundariRavindran. 2000. Safe Motherhood Initiatives: Critical Issues. **Oxford: Blackwell Science**. 218-226.

Shiffman J and Okonofua F. E. 2007.The State of Political Priority for Safe Motherhood in Nigeria.**BJOG**.114: 127- 133.

Simkhada B, Teijlingen E. R, Porter M, and Simkhada P. 2008. Factors Affecting the Utilization of Antenatal Care in Developing Countries: Systematic Review of Literature. **Journal of Advanced Nursing**. 61 (3): 244-260. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

Stephens C. et al. 1994. Environment and Health in Developing Countries: an Analysis of intra-urban differentials using existing Data. **London: London School of Tropical Medicine and Hygiene, Monograph**. In Harpham, T. and Catherine, M. 2001. Urban Health in Developing Countries: a Review. **Progress in Development Studies**. 1 (2): 113-137.

Stierle, B. Tchicaya, A. and Schmidt- Ehry. 1999. Indigence and access to Healthcare in sub-Saharan Africa. **International Journal of Health Planning and Management**. 14 (2): 81-105. In Harpham, T. and Catherine, M. 2001. Urban Health in Developing Countries: a Review. **Progress in Development Studies**. 1 (2): 113-137

Thomas et al. 1999. Household Environment and Health report Elizabeth, South Africa. **Urban Environmental Series Report**. (6). Cape town: Stockholm Environment Institute and South African Medical Research Council. 126. In Harpham, T. and Catherine, M. 2001. Urban Health in Developing Countries: a Review. **Progress in Development Studies**. 1 (2): 113-137.

Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

Ujah I. A. O, Aisien O.A, Motihir J. T, Vanderjagt D. J, Glew R. H and Ugunu V. E. 2005. Factors Contributing to Maternal Mortality in North-central Nigeria: A Seventeen-year Review. **African Journal of Reproductive Health**. 9 (3): 27-40.

United Nations, 2010. Op. Cit. P. 38. In United Nations Women Watch: Information and Resources on Gender Equality and Empowerment of Women. www.un.org/facts-figures.html

USAID, 2011.**Equity: Quantify Inequalities in Access to Health Services and Health Status**. Health Policy Initiative. Washington D.C.

Wall L. L, 1998. Dead Mothers and Injured Wives: The Social Context of Maternal Morbidity and Mortality among the Hausa of Northern Nigeria. **Studies in Family Planning**. 29 (4): 341-359.

WHO and UNICEF (2003).**Antenatal Care in Developing Countries: Promises, Achievements and Missed Opportunities. An analysis of Trends, Levels and Differentials: 1990-2001**. Geneva, Newyork. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.

WHO, UNICEF. (1996). **Revised 1990 Estimates of Maternal Mortality: A New Approach by WHO and UNICEF**. Geneva: WHO and UNICEF. In Shiffman J and Okonofua F. E. 2007.The State of Political Priority for Safe Motherhood in Nigeria.**BJOG**.114: 127-133.

William, P. and Diane C. 1997.Urbanization and Women's Health in South Africa.**African Journal of Reproductive Health**. 1 (1): 45-55

World Health Organization (WHO) 2007.**Maternal mortality in 2005: estimates developed by WHO, UNICEF, UNFPA, and the World Bank**, Geneva, WHO. In Babalola, S. and Fatusi A. 2009.Determinants of Use of Maternal Health Services in Nigeria-Looking beyond Individual and Household Factors.**BMC Pregnancy and Childbirth**.9 (43).

World Health Organization (2013).**Health Statistics and Health Information Systems**.Retrieved on 30/04/2013 from www.who.int/healthinfo/statistics/indmaternalmortality as it appeared on April 18th 2013 16:17:18 GMT.

Zanconato G, Msolomba R, Guarenti L, and Franchi M. 2006. Antenatal Care in Developing Countries: the need for a Tailored Model. **Seminar on Foetal Neonatal Medicine**. 11 (1): 15-20. In Tran T. K, Nguyen C. T. K, Nguyen H. D, Eriksson B, Bondjers G, Gottvall K, Ascher H and Petzold M. 2011. Urban-rural Disparities in antenatal Care Utilization: A Study of Two Cohort of Pregnant Women in Vietnam. **BMC Health Services Research**.11: 120.