INFANT AND CHILD MORTALITY DIFFERENTIALS IN CHIKUN LOCAL GOVERNMENT AREA, KADUNA STATE

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A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA-NIGERIA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN DEMOGRAPHY AND POPULATION STUDIES

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MAY, 2015

DECLARATION

I hereby declare that this thesis has been undertaken by me and that it is a record of my research work. It has not been accepted in any previous application for a higher degree. All sources of information are specially acknowledged by means of references.

Emmanuel Samuel DANJUMA	Date

CERTIFICATION

This thesis titled "Infant and child mortality differentials in Chikun Local Government Area, Kaduna State, Nigeria" meets the regulations governing the award of the degree of Masters in Demography and Population Studies in Department of Geography, Ahmadu Bello University, Zaria and has been read and approved for contribution to knowledge and literary presentation.

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Prof. A. Z Hassan Dean, School of Postgraduate Studies	____________ Signature	______________ Date

DEDICATION

This is dedicated to all the mothers who have experienced infant and child's death in developing countries.

ACKNOWLEDGEMENT

For this piece of research to come to fruition, a lot of contributions, efforts and sacrifices were made by individuals and group of individuals and I feel greatly indebted to each and every one of them.

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ABSTRACT

The study aimed to analyze infant and child mortality differentials in Chikun Local Government Area, Kaduna State-Nigeria. The objectives were to determine the rate, examine the factors affecting, analyse the socioeconomic and demographic determinants and assess the urban-rural differentials in infant and child mortality. A study design was adopted, semi-structured questionnaire was developed and administered to 384 women in reproductive age (15-49) purposively sampled for the study through in-depth interviews and household case studies. 354 questionnaires were returned and found adequate for the analysis indicating a completion rate of 92.2 percent. The questionnaires were analysed using SPSS version 17.0. The results indicate that infant and child mortality rate is higher in the urban area (97.2 percent) among mothers who are married. Most (88.9 percent) of those with post secondary education in the urban area experienced mortality cases, while the highest mortality rate (44.6 percent) occurred among the adolescent mothers in the rural area. It is therefore recommended that programme interventions need to focus on mothers, particularly at the low socioeconomic level. That is, adolescent girls should be encouraged to go to school to at least secondary level. This will increase age at first birth and reduce child death at first birth order. Health services should be brought nearer to the communities so that mothers have access to both during pregnancy and after.

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Infant and child mortality are commonly on top of the agenda of Public health and International development agencies. Recently they have received renewed attention as part of the United Nation's Millennium Development Goals (Mahfouz, Surur, Ajak, and Eldawi, 2009). Approximately 10.8million children worldwide die annually, 41 percent of these deaths occur in sub-Saharan Africa and 34 percent in South Asia (UNICEF, 2007). The global death toll in young children has fallen dramatically in the past half-century. Infant and child mortality rates have declined since 1990, which is the baseline for the Millennium Development Goal (MDG) targets. The drop has been greater in East Asia and the Pacific, Latin America and the Caribbean and Europe where estimated infant and child mortality in 2006 was about half that in 1990. Over the same period, infant and child mortality have fallen only fourteen percent in sub-Saharan Africa. Africa as a whole recorded the most sluggish decline in child mortality among the six WHO regions, 42 percent compared with 60-72 percent from other regions (UNICEF, 2007).

UNICEF and National Population Commission (2001) in "Children and Women's Rights in Nigeria: A wake-up call situation assessment and analysis" the infant mortality rate (IMR) measures the probability of a child dying before his or her first birthday and child mortality rate (CMR) the probability of death between age one and five. These are powerful indicators of child survival; they measure the quality of child care and including the prevention and management of the major childhood disease.

Sub-Saharan Africa was found to have the highest rates of infants and child mortality, where under development, armed conflict and the spread of HIV/AIDS have seriously undermined the efforts to improve child survival. The estimated under-five mortality rate exceeds 200 deaths per 1,000 live births in ten countries in this region. Infant and child mortality also remains relatively high in South Africa. (UNICEF *et al*, 2007).

By 2006, however, three regions-East Asia and the Pacific, Latin America and the Caribbean and Central and Eastern Europe and the Commonwealth of independent state-had achieved under-five mortality rates below 30 deaths per 1,000 live births. This compares with 6 deaths per 1,000 live births in developed regions.

Achieving the Millennium Development Goal four (MDG4) requires that the infant and child mortality rates decline, on average, by 4.4 percent annually between 1990 and 2015. Three regions-East Asia and the Pacific, Latin America and the Caribbean and Europe-achieved this benchmark through 2006 or came close to it, putting them on track to achieve the Millennium Development Goal four (MDG4). In contrasts, the average annual rate of reduction in infant and child mortality since 1990 has been just one percent in sub-Saharan Africa. In recent years, infant and child mortality rates have actually increased in a dozen sub-Saharan Countries. The AIDS epidemic, armed conflict and social instability among others, have contributed to the worsening situation for children in parts of sub-Saharan Africa. In recent years, infant and child mortality rates have actually increased in a dozen sub-Saharan countries. The AIDS epidemic, armed conflict and social instability among others, have contributed to the worsening situation for children in parts of Sub-Saharan Africa (UNICEF *et al*, 2007).

Auwal (2008) reported that the highest infant mortality rate in Africa shows Angola has 261.1, Sierra Leone has 257.7, Niger has 239.0 and Liberia has 231.1. While the lowest infant mortality rates in African are in Seychelles (11.1), Mauritius

(13.4), Cape Verde (35.3), Algeria (35.7) and Botswana (58.6). According to his findings, the trend and pattern of mortality in any given society is to a large extent a reflection of its economic, political and social status.

Urban-rural mortality differentials in Sub-Saharan Africa show that overall mortality, infant and child mortality in particular, is generally lower in urban than in rural areas (Akoto, 2009; Hill, 2001). Various factors account for this, including high concentration of salaried workers (who generally have higher incomes), better education, the concentration of public infrastructures for example; electricity, sanitation services including water supply, household waste, excreta removal and disinfection and hospital infrastructure are more favourable in urban than in rural area. Similarly Odimegwu (2008) examined the socio-economic determinants of infant mortality in Kenya at both urban and rural settings. Results from the fitted logistic regression show lack of significant socio- economic association with infant in both urban and rural Kenya. According to his findings, this can be due to the nature of the occupations available in rural areas which are usually agriculture-based, so women are not available for long time to care for their children. While in the urban areas, because of the assumed availability of health services, the survival of the child is determined by his/her mother's awareness and thus educational level.

UNICEF (2001) stated that with advances in medical science, economic resource and human welfare, it is possible to avoid mortality almost entirely in childhood, except in the most extreme cases or as a result of accidents. Children are most vulnerable in the first few months and years of life. Yet, in the advanced industrialized countries, the under –five mortality rate fell during the 20th century to extremely low levels, averaging only 6 per 1,000 live births by 1998.

Nigeria, like many other developing countries particularly in Africa, is still far from reducing mortality among children to a level of 6 per 1,000 live births despite the advances in child survival strategies, highlighted most notably by the drive for universal immunization against life-threatening, vaccine-preventable diseases (UNICEF, 2001). Data from the 2008 Nigeria Demographic and Health Survey (NDHS) indicate that the infant mortality rate is 75 deaths per 1,000 live births; while the child mortality rate is 157 deaths per 1,000 live births for the five-year period immediately preceding the survey. This translates to about one in every six children born in Nigeria dying before their firth birthday (NPC and Macro, 2009). This has brought about serious stress in the health sector and therefore, posed a major challenge to social and economic development and prompted an unprecedented government response. However, child mortality is consistently lower in urban areas than in rural areas. There is also variation in the mortality levels across zones. The North West zone to which Kaduna State belongs, has very high prevalence rate of 91 and 139 deaths per 1,000 live births for infant and child mortality respectively (NPC and Macro, 2009).

1.2 STATEMENT OF THE RESEARCH PROBLEM

Globally, childhood mortality rates have declined over the years due majorly to various action plans and interventions targeted at various communicable diseases and other immunizable childhood infections which have been major causes of child mortality, but the situation seems to remain unchanged in sub-Saharan African countries, as approximately half of these deaths occur in sub-Saharan Africa despite the region having only one fifth of the world's children population. Environmental, behavioural and socio-economic factors were recognized as important determinants of infant and child survival.

In Nigeria, several studies on child health have been carried out. Mojekwu *et al* (2012) examined the environmental determinants of child mortality using principal component analysis as a data reduction technique with varimax rotation to access the underlying structure for sixty-five measured variables explaining the covariance relationships amongst the large correlated variables in a more parsimonious and simultaneous multiple regression for child mortality modeling in Nigeria. The result from the stepwise regression model shows that household environmental characteristics do have significant impact on mortality.

Ahonsi (1992) examined the developmental implications of early mortality factors in Nigeria using a proximate determinants framework. The study shows that higher parental income and higher density of modern health facilities constitute the combination of factors most likely to bring about sustained reductions in early mortality levels. Also, Fayehun *et al* (2006) examined the direct estimates and cox regression on ethnic differentials in childhood mortality in Nigeria using secondary data from Nigeria Demographic and Health Survey (NDHS) 2003 complemented with 40 Focus Group Discussions (FGD) and 40 In-depth Interviews (IDI) among selected ethnic groups in Nigeria. The study indicated significant difference with ethnic groups in the northern part of Nigeria having the highest risk. There is also a significant effect of demographic and socio-economic variables on childhood mortality.

A Population-based study of effect of multiple births on infant mortality in Nigeria by Uthman *et al* (2010) examined the relationship between multiple births and infant mortality using univariable and multivariable survival regression procedure with Weibull hazard function, controlling for child's sex, birth order, prenatal care, delivery assistance, mother's age at child birth, nutritional status, educational level, household living conditions and several other risk factors. The results show that children born multiple births were more than twice as likely to die during infancy as infants born singleton holding other factors constant. Maternal education and household index were associated with lower risk of infant mortality. Similarly, Adetunji (1994;1995) examined the effect of a child's place of birth, mother's education, region of residence on infant mortality in Nigeria between 1965 and 1979, using data from the 1981/1982 Nigeria Fertility Survey using logistic regression analysis. The study revealed a decline in infant and child mortality between 1965 and 1979. Children born in modern health facilities, irrespective of their mother's place of residence, experienced significantly lower rates of infant mortality than those born elsewhere.

Furthermore, Ojikutu (2008) in his study on Pattern of under-five deaths in Lagos State examined the trend in U5MR in Nigeria using secondary data which show that 73.8 percent of the children die before their first birthday, while 37 percent die before the end of their first month. The most common killers of the under-five mortality are found to be Bronco Pneumonia, Sepsis, Anaemia and Malaria. The study concluded that under-five mortality is found to be related to mother's education and income. However, age of mothers and their occupation are not significant contributors to U5MR. Traditional beliefs are found to be important in the treatment of diseases of children as mothers who see their sick children as spiritually afflicted will rather seek for spiritual assistance than take them to hospital for treatment. This is consistent with the study by Ogunjuyigbe (2004) on the Perception and attitude of the Yoruba's about the existence of *abiku* (children from the spirit) and the mode of treatment to such children.

Elsewhere, many other researchers using data from different regions of the world on child health have reported their findings on either national, regional or state level with broad generalization of causes of infant and child mortality(NPC, 2009; Rahman, 2009; Odimegwu, 2008; UNICEF, 2001; Mahfouz *et al*, 2009; Mazharul, 2010; Murray, C.J.L 2007; Karatepe, 2010; Lindstrom, 2001; and Van Poppel, 2005). The impetus for the broad scale studies has been the interest in formulating broad policies and programmes towards achieving Millennium Development Goal four (MDG4), which aims to reduce the global rate under-five mortality by two thirds between 1990 and 2015.

However, Mahfouz (2009) carried out a study on levels and determinants of infant and child mortality in Malakal town-Southern Sudan using questionnaires and interviews. The study concluded that there was high need for infant and child immunization in Malakal town in addition to health education campaigns for parents and community in general.

A study by Wilopo (2000) on levels, trends and differentials of infant and child mortality and life expectancy at birth in the district of Purworejo, Central Java using baseline data collected by Community Health and Nutrition Research Laboratories, Gadjah Mada University shows that an indirect technique was used by applying data on children ever born and children surviving according to the mother's age and the duration of marriage to West mortality model. The study also shows that a female mortality is slightly lower than male infant mortality but probability of dying between ages 1 to 4 is slightly higher among male children. The life expectancy decline is a consistent with the IMR trend.

Studies have also been carried out on socio-economic determinants on infant mortality in Kenya (Odimegwu and Mustapha, 2008), the relationship between socio-economic differences and economic uncertainty among infant and child mortality in Turkey (Karatepe, 2010) and socio-economic determinants of neonatal, postnatal, infant and child mortality in Bangladesh (Quamrul, 2010). Sufficient details are lacking in understanding the levels and determinants of infant and child mortality at the Local

Government level, given the peculiarities of each Local Government Area in Nigeria. Kaduna State has unacceptably high mortality rate and disease burden profile. In 2003, infant mortality rate were 115 per 1,000 live births; under-five mortality were 205 per 1,000 live births (PATHS, 2010). These figures represent a worsening trend. Leading causes of morbidity and mortality are communicable disease, malaria, diarrhea diseases, respiratory tract infection and vaccine-preventable diseases (VPD).

The high population growth, present downturn in the economy and high level of poverty and destitution are now accompanied by ignorance, poor nutrition, inadequate sanitation and unsafe drinking water, high rate of environmental pollution and rising incidence of prostitution among the young women in Chikun Local Government Area, most of who are unemployed secondary school leavers. The present states of overcrowding and economic squalor are very significant factors in the high mortality rate (Laah, 2003). Infants and children under five years in particular have been the most exposed group for those unfavourable conditions in the Local Government Area. Therefore, there is need for an in-depth study to identify the main causes behind these phenomena.

Also, empirical information is scarce or of variable quality and results from national surveys on health examining the levels and trends, socio-economic and demographic differentials of childhood mortality in Nigeria are only just becoming available. Moreover, community studies dealing with infant and child mortality are lacking in Chikun Local Government Area.

Against the backdrop of the above, this research investigated the socio-economic and demographic differentials of infant and child mortality in Chikun Local Government Area, Kaduna State. Therefore, the study attempts to address the following questions:

a. What is the rate of infant and child mortality in the study area?
b. What are the causes of infant and child mortality in the study area?
c. What are the differences in infant and child mortality among socio-economic groups in the study area?
d. What are the urban-rural differentials in infant and child mortality in the study area?

1.3 AIM AND OBJECTIVES

The aim of this study is to analyze the infant and child mortality differentials in Chikun Local Government Area, Kaduna State. This will be achieved through the following specific objectives; to

i. determine the rate of infant and child mortality in the study area?
ii. examine the factors affecting infant and child mortality in the study area?
iii. analyse the socio-economic and demographic determinants of infants and child mortality in the study area?
iv. assess the urban-rural differentials in infant and child mortality in the study area?

1.4 HYPOTHESIS

The research hypothesis was tested at the level of 0.05 significance difference for the null hypothesis, that is;

H_o: There is no significant difference in infant and child mortality between socioeconomic groups.

1.5 SIGNIFICANCE OF THE STUDY

Information on infant and child mortality rates not only enriches the understanding of a country's socio-economic situation but also sheds lights on the quality of life of the population under study. And studies of mortality indicators have shown the differentials by socio-economic and demographic characteristics which helps to identify populations that are at high risks. Also preparation, implementation, monitoring and evaluation of population, health and socio-economic programmes and policies depend to a large extend on a target population.

Generally, that fact that no such detailed study has been conducted in Chikun Local Government Area makes it an interesting research work. It is hoped that the information generated would not only be useful in identifying at-risk populations but it would also form baseline indicators of the current mortality situation, which can be compared with data collected at a later point to determine whether improvements in child health and quality of life have occurred over time.

Also data generated could be useful in formulating government policies and programmes towards achieving Millennium Development Goal four (MDG4) which aims to reduce infant and child mortality by two-third between 1990 and 2015.

1.6 SCOPE AND DELIMITATION

The study is on analysis of infant and child mortality differentials in Chikun Local Government Area, Kaduna State. Six of the twelve wards selected were; Gwagwada, Kunai, Kuriga (rural); Maraban rido, Nassarawa, Sabon tasha (urban). The study elicited information on the rates, causes, socioeconomic and demographic differentials and urban-rural differentials of infant and child mortality among women aged 15-49, whose children are not more than five years of age as at August 2012, which was the time of data collection.

CHAPTER TWO: CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to present the conceptual framework, including literature review to explain demographic, socio-economic, environmental and health determinants of infant and child mortality. This framework will form the basis for the analysis in this study.

According to Mosley and Chen (1984), all social and economic determinants of infant and child mortality necessarily operate through a common set of demographic mechanisms or proximate determinants to exert an impact on mortality. In this framework, a set of proximate determinants or intermediate variables, that directly influence the risk of morbidity and mortality are identified. All social and economic determinants must operate through these variables to affect child survival. This study adopted the Mosley and Chen (1984) approach in the analysis of child mortality.

2.2 CONCEPTUAL FRAMEWORK

Figure 2.1 shows conceptual framework which with causal relationship on a healthy child or sick child with resultant death. The socio-economic factors (education, occupation and place of residence of the mother) operate through demographic factors (age of the mother, sex of child, birth order and birth interval), environmental factors (access to sanitation, source of water and type of accommodation) and health seeking behaviour factors (i.e place of delivery) leading to a healthy child or sick child. However, with modern medical intervention (through prevention and treatment), a child may remain healthy, the sick could recover and become healthy or treatment may fail and the child dies. Therefore, programme intervention should target determinants of infant and child mortality in other to reduce by two-third of the mortality rate by 2015 as set by millennium development goal four.

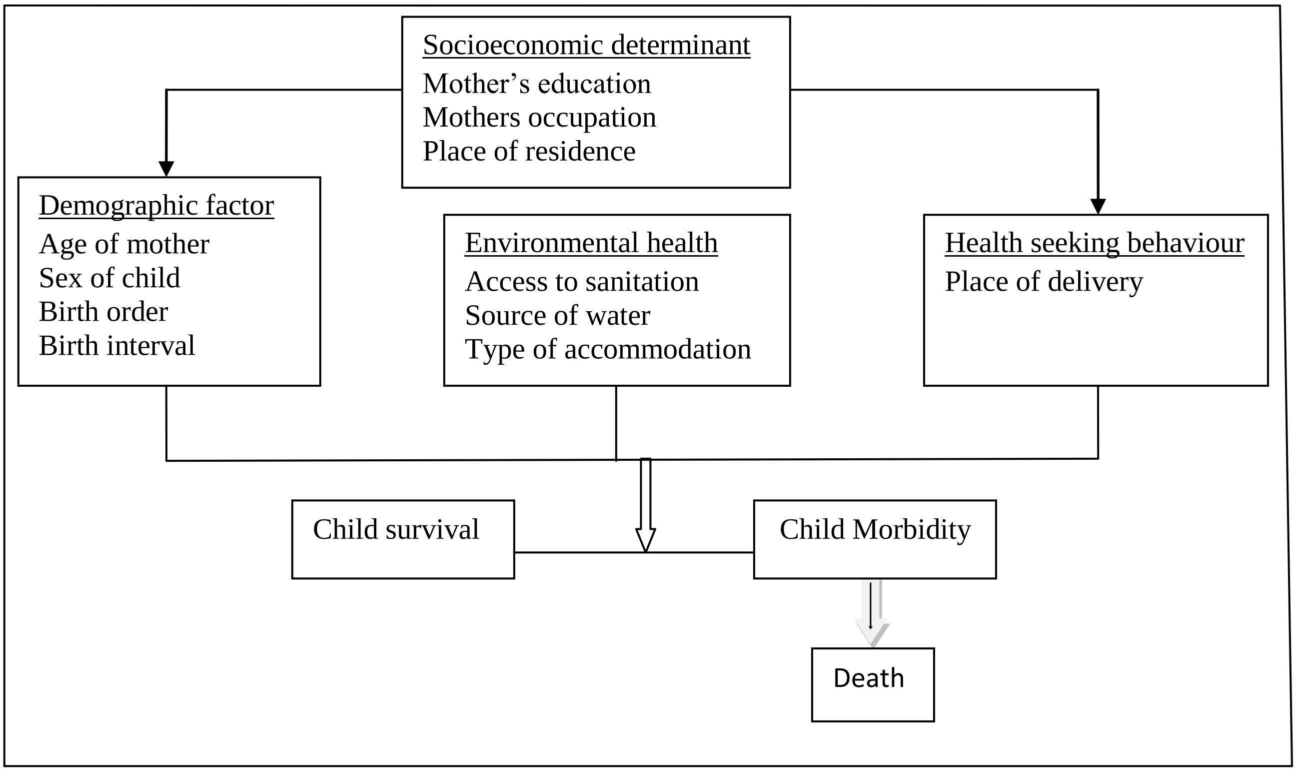


Figure 2.1 Conceptual framework for the child survival

2.3 SOCIOECONOMIC DETERMINANTS OF CHILD SURVIVAL

The relationship between socioeconomic factors and child mortality has been established by several studies; namely Cleland (1990), Hobcraft (1993) and Machado and Hill (2005). The framework adopted from Mosley and Chen (1984) in this study will use mother's education, mother's occupation, income level, type/place of residence as factors which influence infant and child mortality.

Mother's Education

Education is often cited as being very significant in the improvement of living standards. The educational attainment of a population is an indicator of its rising aspirations and consciousness. The resulting rise in aspirations has the effect of improving health awareness and thereby, increasing investments at household and public level. Mother's formal education when considered further is an indicator of knowledge and skills that mothers have to effectively take care of their children.

Maternal education is a major determinant of child survival, influencing care seeking, morbidity and nutritional status. Only 34% of adult Ethiopian women are literate, compared with 49% of men, and 20% fewer girls than boys enroll for primary school. The U5MR for children whose mothers have no schooling is 121% higher than those whose mothers have at least a secondary education (WHO, 2007).

The relationship between maternal education and child mortality has been the topic of much research. Based on the data obtained from secondary and primary source by interviewing 120 mothers using judgment sampling, Ojikutu (based on chi-square test) asserted that U5MR in Lagos State, Nigeria depends on the educational qualification of mothers. Similarly, the chi- square test of independence run by Mahfouz *et al*. (2009) on Malakal Town – Southern Sudan shows that there is strong association between under five-child mortality and education of mothers. Belaineh *et al*. (2007) by case control study on Gilgel Gibe Field Research Center, Southwest Ethiopia, found that among the socio-economic factors, maternal education is significantly associated with under-five mortality. By their study, higher under five mortality was observed among mothers whose educational level was elementary and below as compared to mothers who were above elementary school, the odds ratio (OR) being 11.7 (95% CI: 1.5, 91). Other socio-demographic variables did not show statistically significant association with under-five mortality. Maternal education retained its significance after adjusting for other socio-demographic variables. Children who were born to mothers whose educational level is below elementary were 25 times more likely to die compared to children who were born from mothers whose education is above elementary school, OR=24.8 (95% CI: 2.4, 290).

Dashtseren (2002), using logistic regression, found that mother‘s education is the most significant predictor of infant mortality. He used the 1998 Reproductive Health Survey (RHS) data and vital registration of Mongolia for this analysis. Maternal education has a substantial impact on infant and child survival through increased awareness of problems and better feeding habits, among other reasons. Caldwell (1991) confirmed that mother’s education is a robust determinant of infant and child survival in Bangladesh. Importantly, Kovsted, Pörtner and Tarp (2002), in a study in Guinea-Bissau, showed that education is only a proxy for actual health knowledge, the real determinant of child health and mortality. Maglad (1993), based on household data from Sudan, revealed that parental education, income per adult and public health programs are significantly and negatively correlated with child mortality; maternal education, in particular, is found to have a larger significant effect than that of the father.

Aguirre (1995) identifies that among health and demographic factors, mother’s education is the most important factor that directly affects child mortality. He used full and partial hazard in the Cox proportional model specification and found that there is a strong association between the instantaneous risk of dying and education in the face of other controls. Net of the other factors considered in the model, infants whose mothers had no education (0 years of schooling)
are 13.8 times more likely to die before their second birthday than those whose mothers had attained more than 12 years of schooling (reference group). This relative risk decreases to 4.6 when mothers have primary education and to 2.4 when they have secondary education.

Using data from the first round of Demographic and Health Surveys for 22 developing countries, Desai and Alva (1998) examined the effect of maternal education on three markers of child health: infant mortality, children height for- age, and immunization status. The logistic regression model, standard errors adjusted for intra cluster correlations, shows a consistent negative relationship between maternal education and the probability of infant death. This model contains variables for maternal education, urban residence and child's age. Children of mothers who attended primary school are less likely to die than are children of mothers with no education. Children of mothers with a secondary-school education are the least likely to experience infant deaths. Among the 22 countries, this effect is statistically significant in 11 countries for primary education and in 15 countries for secondary education. The education variables are jointly significant in 14 countries. On the same paper, Desai and Alva (1998) examined the effects of maternal education by including an expanded set of predictors: access to piped water, access to any type of toilet facilities, whether mother has ever had a partner, whether father/stepfather attended primary school, whether father/stepfather ever attended secondary school. Because mother's education serves as a proxy for family's socioeconomic situation, introducing direct controls for some of the socioeconomic variables reduces the effect of maternal education. Averaging across the sample countries, the coefficient for primary education changes from -0.181 to -0.145 and for secondary education from -0.703 to -0.520 and the effect of maternal education is statistically significant for 7 and 13 countries for primary and secondary education, respectively. The two education variables are jointly significant in 11 of the 22 countries. This effect is further reduced by controlling for area of residence through the use of fixed-effects models. Averaging across the sample countries, the coefficient for primary education is -0.153 and for secondary education is -0.339. A coefficient of -

0.153 reflects a 14% reduction in child mortality with only 9 out of the 22 countries showing this level of reduction. Moreover, this effect is statistically significant in only 4 of the 22 countries, even after using a generous one-tailed test. Obtaining secondary education-as opposed to remaining uneducated-has a larger effect, with a mean reduction in the odds of infant mortality of about 27%, but the effect is statistically significant in only 7 of the 22 countries.

Mother's Education and Income Level

Mother's education is likely to affect child survival. The need to work, especially outside the home, may affect survival chances directly simply by preventing the mother from caring for the infant. This may have substantial effects through lack of proper feeding and particularly breastfeeding early in life (Hobcraft *et al* 1984). However, a working mother can also be associated with family income which can increase a child's survival. Ibrahim *et al* (1994) observed that non-farming mothers in a household with fewer children were more active than farming mothers in using oral rehydration therapy (ORT). They concluded that mothers who had more time to give to child care were more likely to use ORT.

Kishor and Parasuraman (1998) found that mother's employment had a negative effect on the child's survival, if the mother works away from home for cash, lives in urban area or lives in south of India. This therefore means that it is the mother's absence rather than employment status which affects the child. If the mother works, but commute from where the child resides the outcome might be different. Short *et al* (2002) identified that both work compatibility and work intensity reduce women's involvement in child care in China. However, they also pointed out that, if women with intensive work demands provide less child care, this does not necessarily hinder children's physical and psychological development. This is because in China, relatives or other members of the household assist in child caregivers such as grandmothers can reduce a mother's burden greatly.

In India, Krishnaji (1995) showed that working mothers experience a greater child loss than non-working mothers in respect of both male and female children. Generally, a narrower gender differential in child mortality among working mothers was observed in most of the states, however in the north and the northwest, the work status of women had a greater impact on male children than on girls. To explain the case in the north and northwest, Krishnaji argued that it is because in general there is a strong bias against girls in these states. The male children of non-working mothers are the best protected among all categories so that the withdrawal of this protection by working mothers-if what is observed can be described so-has a greater impact for boys.

Place of Residence

Place of residence of the mother affects the survival status and nutritional status of the living children in developing countries. This relationship is well established by several studies; Mahmood (2002), Sastry (2004), Nanna, *et al* (2007). The urban areas usually have better infrastructure for health services compared to non-urban areas. They are usually more developed. Machado and Hill (2005) showed that having a mother who lives in the highest developed community reduced the odds of neonatal deaths. They concluded that community infrastructure may improve hygienic practices. Furthermore, interactions between friends and neigbours in the communities may lead to changes in behaviour regarding infant care and in this case better off communities may benefit from the overall level of community education (Machado and Hill, 2005).

Also using Demographic and Health Survey (DHS) data, Wang (2002) had investigated determinants of child mortality in low-income countries like Ethiopia both at the national level, and for rural and urban areas separately. DHS data from over 60 low-income countries between 1990 and 1999 reveal that there is significant gap in child mortality between urban and rural areas. Given that the poor are mainly concentrated in rural areas, the above evidence suggests that health interventions implemented in the past decade may not have been as effective as intended in reaching the poor. She uses both ordinary least square (OLS) and weighted least square (WLS) to check the consistency of the estimates. In a related study, Wang (2003), using the results from the 2000 Ethiopia DHS, examines the environmental determinants of child mortality. She runs three hazard models, the Weibull, the Piece-wise Weibull and the Cox model to examine three age-specific mortality rates: neonatal, infant and under-five mortality by location (urban/rural); and other socio economic and health factors such as female education attainment, religious affiliation, income quintile, and access to basic environmental services (water, sanitation and electricity). The estimation results show that children born in rural areas face much higher mortality risk compared to those born in urban areas.

2.4 BIO-DEMOGRAPHIC DETERMINANTS OF CHILD SURVIVAL

Age of the mother

Some studies like those conducted by Hobcraft *et al* (1985), Rustein (2000) and Machado and Hill (2005) have shown some association between the age of the mother at birth and child survival. Hobcraft *et al* (1985) show that mortality was clearly higher among children of teenage mothers. However, in their study there was nothing to suggest increase risks for children born to mothers at older ages even those with mothers who were aged 35 or above after controlling for birth spacing. Mahmood (2002) on the contrary observed that children of older women (30-39 years) were exposed to significantly higher neonatal and post-natal mortality.

Sex of the child

A number of studies have shown mortality differential by sex. Male mortality usually exceeds female mortality in the neonatal period, but this differential is reversed in the post-neonatal period. Higher female than male mortality contained through childhood and this is supported in studies by Bhuiya and Streatfield (1991) and Arokiasany (2002).

Son preference is most prevalent in the East Asia, south Asia, Middle East and North Africa. Hesketh and Xing (2006) point out that son presence is manifest prenatally, through sex determination and sex selective abortion and post-natally through neglect and abandonment of female children, which leads to higher female mortality.

One will expect mother’s education to intervene in sex determination. However, Bhuiya and Streatfield (1991) showed that the positive effect of mother’s education on child survival is not similar for boys and girls in Bangladesh. They showed that for boys a change in mother’s education from no schooling to 1-5years of schooling resulted in a reduction in the predicted risk of 45percent, while for girls it was only 7percent. Furthermore, a change from no schooling to 6 or more years reduced the risk of dying by 70percent for boys and by only 32percent for girls. However, Eswaran (2002) concluded that the empowerment of women, which increases the bargaining power of wives relative to their husbands, results in a decline in fertility and in the mortality rate of children.

Although most studies show discrimination bias towards girls, Pande (2003) identified sex composition of sibling as a factor in selective discriminatory practices that affect the health of surviving children. He identified that in rural India all girls do not face the same level of discrimination than a boy was born into a family that already has two or more surviving daughters and no surviving sons are among the most likely to be severely stunted (38%) and are less likely to be immunized than first daughters.

Birth Order

High mortality has been associated with being the first born and with high birth order. Hobcraft (1985), showed a clear excess of neonatal mortality for the first births and first born children continued to be at a disadvantage during the remainder of infancy. However, contrary to the general belief, there was no clear evidence of excess mortality for children of birth order four to six, nor even for those of order seven or higher, once the other factors in the regression model were controlled. This could suggest that mortality associated with births of high orders may be predominantly caused by other factors like birth intervals. However, it should be noted that the outcome of the first birth could be associated with the age of mother rather than the order. Hobcraft (1991) concludes that delaying the first birth until a woman is at least 18years of age might reduce the risk of death for first born children by up to 20 percent on average and up to 30 percent in a few countries. Other researchers like Mohammed, *et al* (1998) linked the death of the first born to low birth weight.

Birth Interval

A number of studies have demonstrated mortality risks among children born after short birth intervals. Some of these studies have investigated possible pathways through which preceding birth intervals may affect childhood survival. Boerma and Bicego (1992) provide possible pathways through which the relationship between preceding birth intervals and child postnatal mechanisms. As far as prenatal mechanisms are concerned, it is believed that women with a short interval between two pregnancies have insufficient time to restore their nutritional reserves, which might affect foetal growth. These researches mentioned several studies which reveal increased risk of intrauterine growth retardation for shorter inter-pregnancy intervals. Both intrauterine growth retardation and prematurity lead to low birth weight, which is a strong determinant of infant mortality.

Postnatal mechanisms include poor nutrition of the mother, which may lead to impaired lactation and the inability to provide adequate care for the children. Sibling competition may also have effect on the survival of the child. The results of Boerma and Bicego's (1992) study suggest that prenatal factors are more significant than postnatal factors. Hobcraft, *et al* (1985) conclude that short child spacing could be the dominant source of most of the apparent increase in risks at high birth orders and higher ages of the mother. Children born at very short intervals after preceding birth (1 to 17months) are about twice as likely to die as those after intervals of 24 to 47months: those born after 18-23months experience an excess risk of about one-third (Hobcraft, 1991)

Some studies showed that the effect of birth spacing disappear if the women attend prenatal care. For example, Mahmood (2002), showed that for mothers with shorter previous birth intervals who have used prenatal care, their babies are significantly more likely to have better survival chances during the neonatal period than those mothers with the same short birth interval who did not receive prenatal care for the index child.

2.5 HEALTH SEEKING BEHAVIOUR AS A DETERMINANT OF SURVIVAL

Unlike other determinants which affect the rate at which children move from health to sickness, this group influences this rate (through prevention) and rate of recovery (through treatment), (Hill, 2003). For preventive measures this variable is commonly assesses by reported use of such preventive service services as immunization, malaria prophylaxis or antenatal care. For curative measures the providers of care and types of therapy taken for specific conditions are assessed (Mosley and Chen, 1984).

Rustein (2000), in his comparison of DHS data from 62 developing countries showed that increases in the percentage of births that received medical care at delivery were associated with decreasing mortality during first year of life. An increase in prenatal care was associated with decreases in mortality among those under-5years as well. Boerma and Bicego (1992) even linked prenatal care and birth intervals, in that they hypothesized that unlike pregnant women with short birth interval, pregnant women with longer with longer birth intervals are more likely to attend prenatal care services which ultimately results in a healthy child birth.

Rustein (2000), pointed out that an increase in the percentage of children vaccinated against measles was associated with a decline in infant mortality and with mortality at ages greater than one. He went further to show that increases in the percentage of children receiving medical attention for diarrhea; acute respiratory illness and fever were associated with the declines in mortality.

CHAPTER THREE: THE STUDY AREA AND METHODOLOGY

3.1 THE STUDY AREA

3.1.1 Location

Chikun Local Government area is located geographically on Latitude 10^0 N and $10^050''$ North of the equator and Longitude $6^04''$E and $7^05''$ East of the Greenwich Meridian. It is located on the Southern part of Kaduna State and share common boundaries with Kaduna North Local Government and Igabi in the North. In the South western part, it has a common border with Niger State and in the East it share boundaries with Kajuru and Kachia Local Government Area (Figure 3.1).

At present Chikun Local Government Area has Kujama as its administrative headquarters, Gonin Gora, Narayi, Nassarawa, Trikaniya, Sabon Tasha, Ungwar Romi, Ungwar Sunday, Ungwar Yelwa, Karatudu and part of Barnawa as it component area covering a total land size of 4801 square kilometers (Bako, 2006).

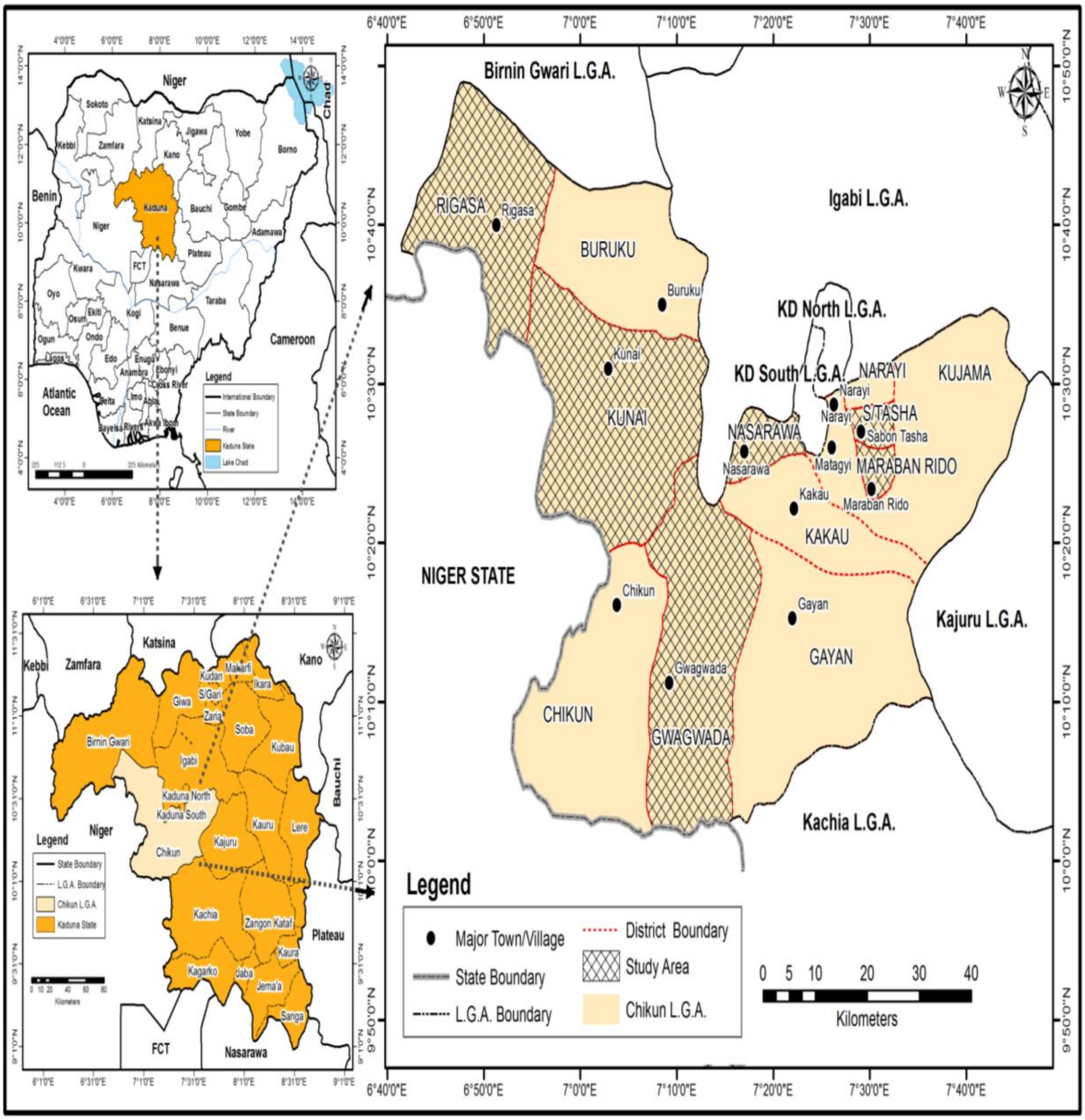


Figure 3.1 Map of Chikun Local Government Area

Source: Administrative Map of Chikun Local Government

3.1.2 Geology and Relief

Chikun Local Government Area is lying on a gentle undulating plain ranging from 450-650m above sea underlined by the crystalline basement complex of the Precambrian age (Laka, 1998). The Local Government and it environs are situated on a lowland area unlike Tudun Wada and Tudun Nupawa which are on rocky terrain highland (Kogi, 2008). In some parts of the area, there exist some outcrops of hard resistant granite rocks which are basically the result of weathering activities on the Precambrian rocks which were exposed by erosion through ages. This gave certain landforms like inselbergs and huge rocky lands e.g. Dutse Narayi, Gonin Gora, Kujama, Trikaniya and Romi, and has minerals like gold and traces of coal.

3.1.3 Climate

Chikun Local Government Area is under the influence of two major trade winds, which are the tropical continental air mass (cT) blowing from the North-East through the Sahara desert, and bring about dry season and the tropical maritime air mass (mT) blowing form South-East through the Atlantic Ocean and it brings about the wet season. The inter-tropical convergence zone (ITCZ) and the (ITD) inter-tropical discontinuity varies in position depending on time of the year or season or the relative strength of the dominant wind or air mass respectively.The study area is situated within the guinea savannah zone which is characterized by two distinct seasons, that is, the wet and dry season, with a climate type according to Koppen's classification as a tropical wet and dry climate.

This region is said to have 6-7 months of rainfall with the onset between April and May, It has a short dry period in August called the 'August break'. Rainfall in this region sometimes exceeds the month of September though there are variations, but have it peak in July and August. The mean annual rainfall ranges from 1397mm-1551mm and the dry season on the other hand begins in November and ends in March a period of five (5) months. And within this period comes the Harmattan cold wind which prevails from December – February and a short but excessive heat period between March to April and sometimes the early days of May depending on when the rain commence (Gambari, 2004).

The temperature is high throughout the year, with the highest in March ranging between 37^0c-42^0c with the lowest temperature in January ranging between 5^0c-13^0c. Relative humidity ranges between 10%-30% in dry season and 70%- 90% in wet season, in the afternoon and night or at dawn respectively. This relative humanly is generally higher at nights (Isuwa, 2005).

3.1.4 Soil

The soils of the study area are generally similar to those found in other areas of the Northern region typically of lateritic origin, and some of the soils found here are however formed from drift deposits, this area has a covering material of about 4.3m deep or more, rich in agricultural activities and its very identical to the Zaria loamy that has supported cotton production over years.

Chikun Local Government Area has a ferruginous soil which is a tropical soil derived mainly from basement complex rocks and these soil develop on well drained sites, hydromorphic (fadama) and alluvial soils are also common but associated to stream and river banks and channels in this area. The fadama are exceptionally important as they are fairly rich in nutrient elements and have a good to excessive water retaining capacity that could persist in dry season, and these regions are used for cultivation of crop like rice, sugarcane, cassava, cocoyam and vegetable etc.

3.1.5 Vegetation

The vegetation in this area lies in the guinea savannah zone that has a vegetation type that consists of mainly orchard bush with short grasses and some trees of medium height. The vegetation is the dry by-product of trees devastated by man over many years, as an attempt to satisfy his needs for survival and this has resulted into a 'derived type of savannah" as evidence. Over the years, settlers in this region have planted trees mostly economic trees such as mango, guava, orange and pawpaw which are now found in densely concentrated areas of Chikun Local Government Area (Isuwa, 2005).

3.1.6 Historical Growth and Development

Chikun Local Government Area was created in May 1989 from the then Kachia Local Government Area by the then military administration of General Ibrahim Babangida. The Local Government Area was among several additional ones created all over the country.

When one examines the situation at that period of time, therefore is of no doubt that it must have been in conformity with the philosophy of the 1986 guideline which states that " in order to achieve sufficiently larger scale of operations, be able to perform all these functions reasonably, while remaining substantially, local governments should as much as possible, serve a total population of between 150,000 – 800,000 people, provided that there are no limits which may be varied in the exceptional geographical circumstances and provided further that there should be no upper limits to size of local governments covering major towns so as to ensure that each town is within a single unit (Bako, 2006).

Chikun Local Government Area took off with Kajuru and Chikun as its districts but later in early 1991 Gwagwada and Kurena were created making four districts with the administrative headquarter at Kujama. Between “1989-2006” the Local Government has had 13 Chairmen and Sole Administrators (Adamu, 2007).

The study area is dominated by the Gbagyi people who are the indigenes of the area. Other ethnic groups found in this area are; Jaba, Kataf, Bajju, Adara, Kaninkon, Ikulu, Yoruba, Igbo, Idoma and Igala, making the population more heterogeneous.

Chikun Local Government Area has rapidly developed and expanded in population over the last few years due to immigration of people from other part of the metropolis due to incessant crisis between 1992 and 2002. The indigene of this area hold in high esteem their cultural heritage and cultural festivities are seen at different times and places especially within the traditional settlement of the people.

3.1.7 Socio-economic activities

Generally the economy of Chikun Local Government Area is agricultural based, which is dominated by subsistence agriculture and only a few are produced for the local markets. This agriculture is now supplemented by various non-agricultural traditional industries like the local dyers, clothes weavers, blacksmithing, potters and knitting etc. These have contributed tremendously to giving employment to inhabitant who are involved as being an apprentice has given you an automatic source of making a living by payments for productions or amendment. Local beer brewing in Chikun Local Government Area in forms called Jiko and Burkutu has to a good extends provided a source of income to producers but there is no statistical data to prove how these local traditional industries has help in GDP growth in the state (Kogi, 2005).

Some modern manufacturing industries are also situated here which enhance the socio-economic activities of Chikun Local Government Area e.g; the Kaduna Refinery (KRPC) in Sabo Tasha located in the mid 1970s base on government or political reasons has provided job opportunities and markets for many goods in Chikun Local Government Area as well as the Peugeot Automobile Assembly Plant (PAN), Textile industries, Nigeria Bottling Company (Pepsi and Coka cola) and the tissue paper industry “Paladin” in Goni Gora. Poultry owners and feed producers contribute to reasons why this area is highly rated in term of socio-economic activities as well as the bulk of its population too (Bako, 2006).

This area is characterized by other economic activities such as trading, hotel services, restaurants, commercial vehicles, petty trading, hawking, banking etc. There are still reasonable seizes of farmland at different areas suited for farm practices and the production of crops like rice in large quantity and this region is acclaimed to be the home of rice production in Kaduna State (Bako, 2006).

3.1.8 Population Growth and Distribution

Chikun Local Government Area today has grown in population which is evident from the difference between the population census of 1991 and that of 2006. The total population of Chikun Local Government Area in 1991 was 255,526 persons with the male population making up to 132,930 and females 122,632 respectively. The 2006 census reveals a population of 368,250 persons with 186,874 males and 181,376 females. And a good comparison shows that the population has grown to about 112,688 people within a period of 15 years. Thereby, expressing that Chikun Local Government Area has an annual growth rate of about 3.2% (NPC 1996).

In 1991 the population was distributed across two districts i.e. Kujama and Gwagwada which carried a population of 147,182 and 108,380 respectively with a percentage distribution of about 6.49% and a total sex ratio of 108.40 though the newly created districts were not created in the plan (NPC, 1991). It was then realized that the bulk of population as at 1991 in Chikun LGA were situated in the rural areas with few indigenous population in the densely populated few urban centers and the densely population in the local government grew progressively from 43% in 1991 to 57% in 2000 and 59% in 2001 in response to population growth from 255,562 in 1991, 339,323 in 2000 and 350,181 in 2001 respectively. All under a fixed land area by square kilometer (Bureau of Lands and Survey Kaduna State, 2004).

3.2 METHODOLOGY

3.2.1 Reconnaissance Survey

A reconnaissance survey was carried out in order to have a good and comprehensive knowledge of the areas. This guided in understanding the differentials that acquainted the researcher with relevant issues to address in formulating the questionnaire and also to ascertain the most appropriate sampling technique to be used in selecting the sampling areas.

3.2.2 Sources of Data

Data for the purpose of this research were collected from primary and secondary sources. The primary sources of data will include responses obtained from the administration of questionnaires, field observations, hospital records and Focus Group Discussion (FGDs) with women of reproductive aged (15-49). The questionnaire will consist of structured questions specially designed to obtain information from the sample population in the study area.

This secondary source of data will be acquired from existing official and unofficial statistics from both national and international publications including articles, journals, thesis, dissertation and websites. Data from National Population Commission (NPC), United Nation Children Fund (UNICEF), World Health Organization (WHO), Save the Children (SCUK), Ministry of Health and the Primary Health Care department of Chikun Local Government Area, Kaduna State will be required for background information on population growth and distribution of health facilities.

3.2.3 Types of Data

The information collected from the women of reproductive age 15-49 in the study area included;

a) Demographic and socioeconomic characteristic such as; age of respondents, age at first birth, marital status, income level, educational level, occupation, household size.
b) Number of children ever born (CEB).
c) Number of children who died before age one
d) Number of children who died between age one and five
e) Number of children surviving
f) Number of healthcare facilities

3.2.4 Sampling Size and Sampling Technique

Chikun Local Government Area has 184,839 females out of the total population of 372, 272 (NPC, 2006). The study area is made up of twelve (12) wards both in the urban and rural area. The wards in the urban area include; Sabon Tasha, Yelwa, Sabon Gari, , Kujama, Nassarawa, Narayi and Maraban Rido ward. While Kunai, Kakau, Chikun, Gwagwada and Kuriga are wards in the rural areas.

For this study, six of the twelve wards in the Local Government Area were selected for in-depth research through the application of questionnaires and analysis of hospital records. The systematic sampling method was employed by drawing a list of the twelve wards when arranged in alphabetical order both for the rural and urban. Three wards with the highest population both in the rural and urban area were selected to make the sample frame (See Table 1.1).

Table 1.1: Sample Wards in Chikun Local Government Area

S/No.	**Wards**	**Selected wards**
	Rural wards	
1.	Chikun	Gwagwada
2.	Gwagwada	Kunai
3.	Kakau	Kuriga
4.	Kunai	
5.	Kuriga	
	Urban wards	
6.	Kujama	Maraban Rido
7.	Maraban Rido	Nassarawa
8.	Narayi	Sabon Tasha
9.	Nassarawa	
10.	Sabon gari	
11.	Sabon tasha	
12.	Yelwa	

Source: Chikun LGA 2006

The selected wards were assigned number of questionnaires proportionate to the projected population through 2011 of the Locality lists and figures of Chikun Local Government Area, 2005 (NPC, 2005) as presented in Table 1.2. The projected ward population is derived from the formula:

$$\mathbf{P_{t+n} = P_t e^{rn}}$$

Where P_{t+n} = Future population (2011)

P_t = Base year (2005), r = Growthrate (3%)

n = Interval between future population and base year population (2011-2005= 6years)

Table 1.2: Selected Wards and Proportion of respondents

S/No.	Selected Wards	Locality Population in 2005	Projected Population 2011	Number of Questionnaires
1.	Gwagwada	28,829	34,515	59
2.	Kunai	16,768	20,079	35
3.	Kuriga	22,830	27,332	45
4.	Maraban Rido	16,332	19,553	35
5.	Nassarawa	51,717	61,916	97
6.	Sabon Tasha	42,649	51,061	83
	Total	**179,125**	**214,453**	**354**

To determine the sample size, Krejcie and Morgan (1970) method of determining sampling size will be adopted which states that for an area with a population between 75, 000 – 999, 000 the sample size could be 384. Since the population of the study area falls between this range, the sample size to be used is 384. However, only 92.2 percent (354) of the responses were fit for analysis as seen in Table 1.2.

The purposive sampling method will be adopted for the purpose of questionnaire administration at the ward level. In every ward, the households with five year and below children will be identified with the help of a local guide who is resident in the ward. These households will be numbered subsequently. The questionnaires will be administered on the households identified serially until the required number for the ward is obtained.

The Focus Group Discussions (FGDs) were conducted in each of the wards. It involved the interaction with 5 – 10 women to speak about their knowledge and experience(s) on infant and child mortality. The target population were household heads and women of reproductive aged 15 – 49. In all, there were six (6) Focus Group Discussion (FGD) sessions, one in each ward of the study area.

3.2.5 Method of Data Analysis

The data were analyzed by coding the complete questionnaires into a computer. Both descriptive and inferential statistics were be used in the data analysis and results were presented in frequency distribution and percentages. Tables and figures were used to present information in summary form.

The chi-square (X^2), a non-parametric test was employed to test the assumption that there is no significant difference in infant and child mortality between socio-economic groups. The chi-square (X^2) test will be suitable for this, because the data sets ware at the normal and ordinal levels of measurements.

CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

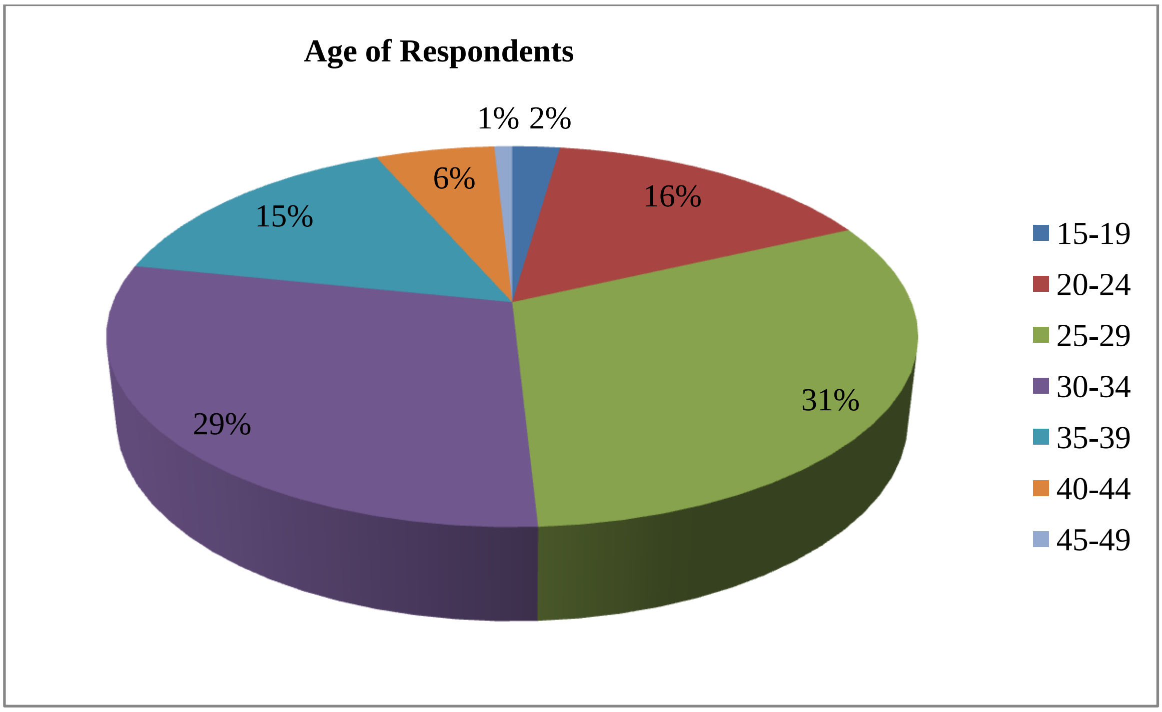
This chapter presents the result of 92 percent (354) of the data obtained after the information in the questionnaires was coded and analysed using Statistical Package for Social Science (SPSS) version 17.0. This allowed for the description of variables through frequency distribution and presentation of results in percentages. Also chi-square test was used to test some associations between the dependent (infant and child mortality) and a set of independent variables such as age of respondents, marital status, ethnicity, educational attainment, income level, household size and resident of respondents. Therefore this chapter discusses mortality estimates which are disaggregated by demographic and socioeconomic characteristics in order to identify segments of the population requiring special attention.

4.2 DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF RESPONDENTS

4.2.1 Age of Respondents

Table 4.1 shows the distribution of respondents by age. Majority of the respondents (31.1 percent) are in the age group 25-29, followed by those in the age group 30-34 years with 29.1 percent. The age groups 20-24 and 35-39 have 15.8 and 15.3 percents respectively. The age group 40-44 years has 5.6 percent, age group 15-19 years has 2.3 percent, while those who are 45 years and above are 0.9 percent.

Figure 4.1: Distribution of Respondents according to Age



Source: Field survey, 2012

Some studies like those conducted by Hobcraft, et al (1985), Rutstein (2000) and Machado and Hill (2005) have shown some association between the age of the mother at birth and child survival. Also, in consistent with Table 4.1, Hobcraft, et al (1985) showed that mortality was clearly higher among children of teenage mothers. However, Mahmood (2002) on the contrary, observed that children of older women (30-39years) were exposed to significantly higher infant mortality.

4.2.2 Age at First Marriage of Respondents

Table 4.2 shows the distribution of respondents according to age at first marriage of the mother. Most of the women were first married between the age of 20-24 years (40.7 percent) and 25-29 years (30.5 percent).This shows that most of them had their first marriage at a younger age.

Table 4.1: Distribution of Respondents according to Age at First Marriage

Age group	Frequency	Percentage
15-19	81	22.8
20-24	144	40.7
25-29	108	30.5
30-34	19	5.4
35-39	2	0.6
Total	**354**	**100.0**

Source: Field survey, 2012

4.2.3 Age at First Birth of Respondents

Table 4.3 shows the distribution of respondents according to age at first birth. Most of the mothers had their first child birth between the age of 20-24 years (40.7 percent) and 25-29 years (30.2 percent). Most of the women gave birth the very year they got married.

Table 4.2: Distribution of Respondents according to Age at First Birth

Age group	Frequency	Percentage
15-19	84	23.2
20-24	144	40.7
25-29	108	30.2
30-34	19	5.4
35-39	2	0.6
Total	**354**	**100.0**

Source: Field survey, 2012

4.2.4 Marital Status and Type of Marital Union of Respondents

Table 4.4 shows that 96.6 percent of the respondents are married, 1.7 percent are single parents, 1.4 percent are separated and only 0.3 percent are divorced. Most respondents are married probably because having a child outside marriage is not uncommon in the study area.

Also, it is clear in Table 4.4 that majority of the respondents practice monogamy (92.1 percent), while 5.6 percent practice polygamy. The “others” category is made up of those respondents that are not in marital union and were never married. The large proportion that are monogamous is probably tied to their religious beliefs of "one man to marry one wife" as most (92.9 percent) of the respondents are Christians (see Table 4.5).

Figure 4.2: Distribution of Respondents by Marital Status

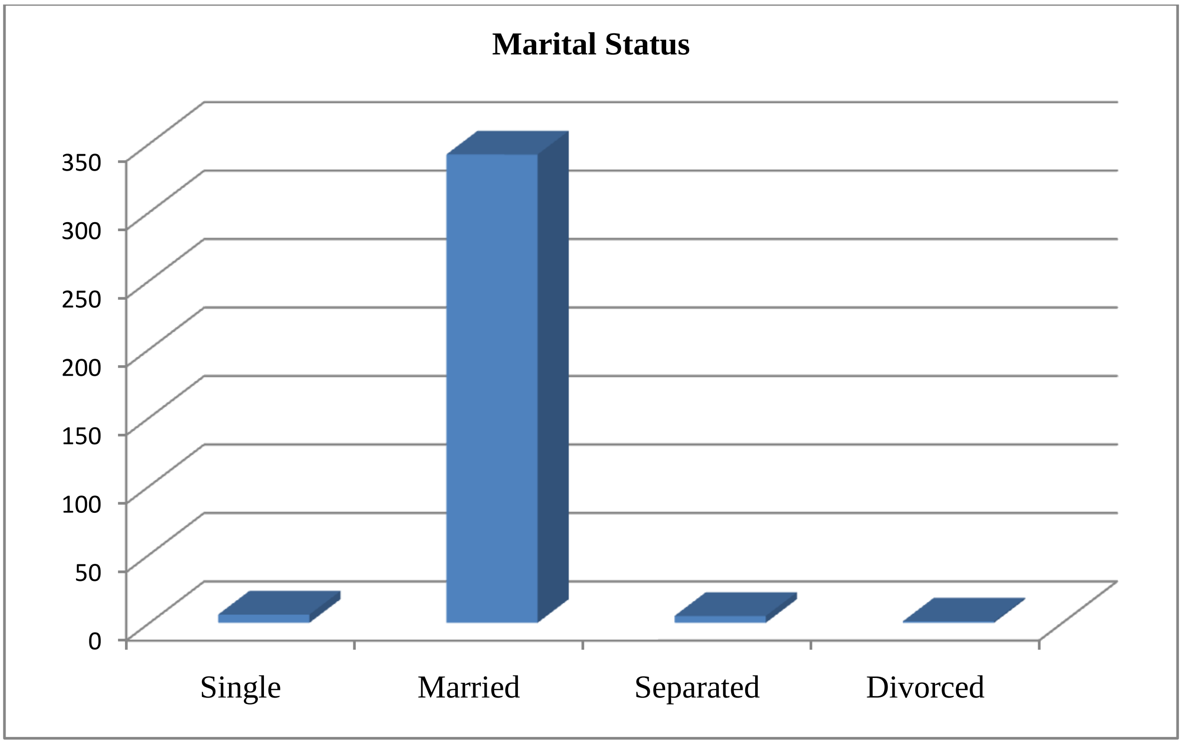
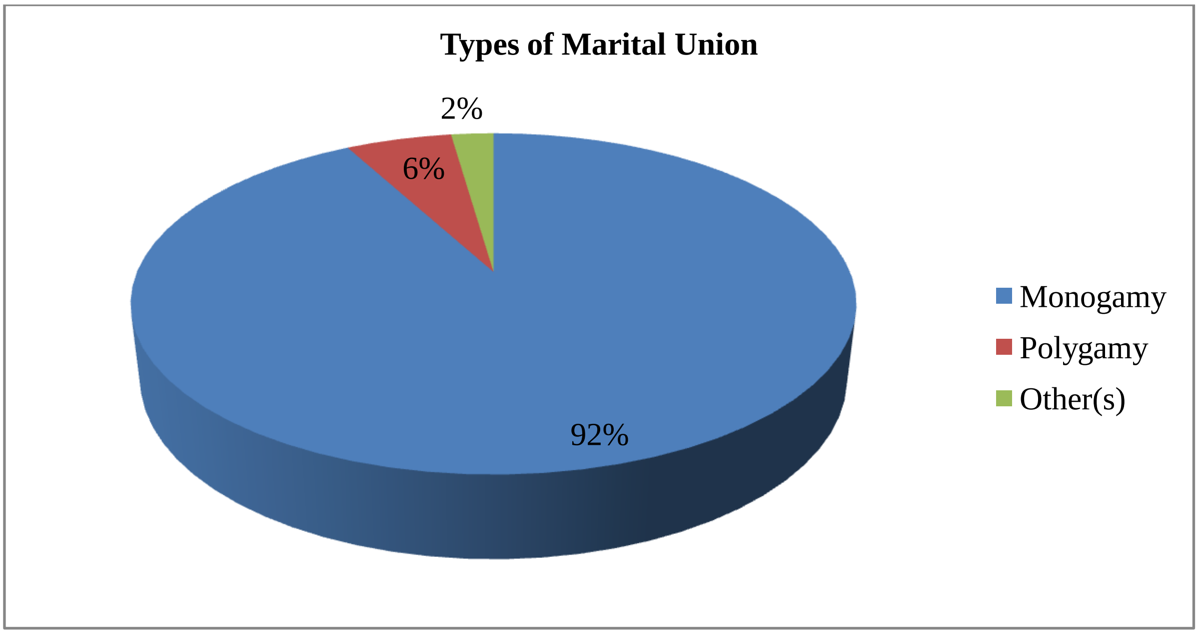


Figure 4.3: Distribution of Respondents by Type of Marital Union



Source: Field survey, 2012

4.2.5 Ethnicity and Religion

The distribution of respondents according to ethnic group and religion is presented in Table 4.5 for ease of analysis, the respondents ethnic group was categorized according to Gbabyi, Hausa/Fulani, Igbo, Yoruba, southern Kaduna (comprising; Adara, Bajju, Ham, Kagoma, Kagoro, Ikulu among others) and northern minority mostly from Nassarawa and Plateau States. Majority of the respondents are the Gbagyis' with 44.4 percent, followed by those from southern Kaduna with 22.9 percent.

Table 4.3: Distribution of Respondents according to Ethnicity and Religion

Ethnicity	Frequency	Percentage
Gbagyi	157	44.4
Hausa/Fulani	21	5.9
Igbo	26	7.3
Yoruba	26	7.3
Southern Kaduna	81	22.9
Northern minority	31	8.8
Others	12	3.4
Total	**354**	**100**
Religion		
Christian	329	92.9
Muslim	25	7.1
Total	**354**	**100.0**

Source: Field survey, 2012

The northern minorities (mostly from Nassarawa and Plateau State) have a proportion of 8.8 percent; both Igbo and Yoruba ethnic groups have 7.3 percent each, while Hausa/Fulani have 5.9 percent. According to Danjuma (2009), the study area is dominated by the Gbagyi people who are the indigenes of the area. Other ethnic groups include; TIV, Idoma and Igala, making the population more heterogeneous.

The distribution by religion shows that majority of the respondents (92.9 percent) are Christians and only 7.1 percent are Muslims. However, Gaisie (1979) explains that religion per se does not greatly affect infant and child mortality but lower levels of infant and child mortality may be a reflection of the fact that the group may contain more educated mothers than the group consisting of traditional or other worshippers.

4.2.6 Educational Attainment of Respondents

The distribution of the respondents by level of education as shown in Table 4.6 reveals that 49.2 percent of the respondents have secondary education, 28.2 percent and 15.8 percent have tertiary and primary education respectively. In all 5.9 percent of the respondents have no education, while 0.8 percent has “other” types of education which include those with Quranic education and adult literacy programmes. Majority of the respondents have post-primary education, therefore the higher the level of education of the mothers, the lower the infant and child mortality. Caldwell (1981) provided three explanations for the phenomenon, more educated mothers become less fatalistic about their children's illness, they are more capable of manipulating available health facilities and personnel and they greatly change the traditional balances of familial relationships with profound effects on childcare.

Table 4.4 Distribution of Respondents according to Level of Educational Attainment

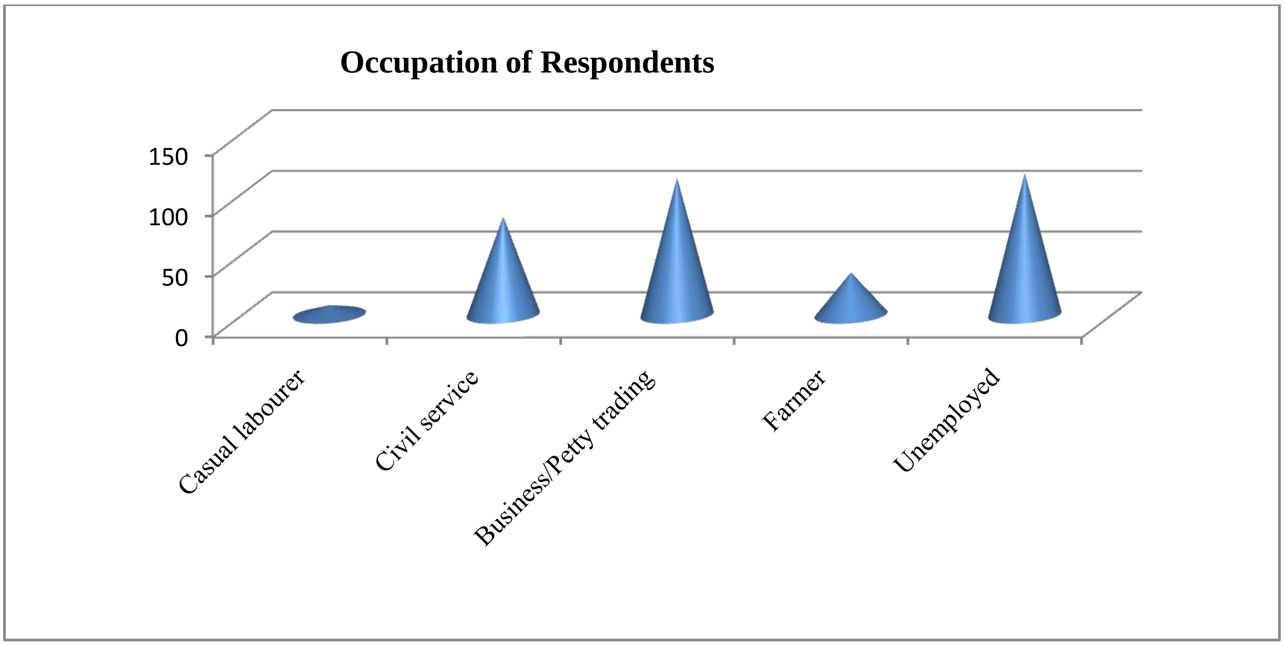
Educational attainment	Frequency	Percentage
Tertiary	100	28.2
Secondary	174	49.2
Primary	56	15.8
None	21	5.9
Others	3	0.8
Total	**354**	**100.0**

Source: Field survey, 2012

4.2.7 Occupation of Respondents

The study results indicate that the distribution of respondents by their most recent occupation as shown in Table 4.7. It reveals that though some of the respondents (33.1percents) are unemployed, most of them have occupation such as petty trading (31.9 percent), civil service (22.9 percent), farming (9.9 percent) and casual labour (2.3 percent). In developing countries, a handful of empirical findings point to a lower survival rate among children of working mothers compared to children of non-working mothers (Basu and Basun 1991; Kishor and Parasuramam 1998). Infact, economic activity of the mother can generate earnings, increase her autonomy and her power in decision-making all are outcomes that are expected to improve child survival. However, the negative association between maternal employment and child survival is usually attributed to the reduction in the amount of time working mothers spend in childcare (Desai and Jain 1994).

Figure 4.4 Distribution of Respondents according to Occupation



Source: Field survey, 2012

4.2.8 Income levels of Respondents

Income is one of the most important determinants of the standard of living, economic and social welfare. Table 4.6 shows that respondents who earn less than N5000 have the highest proportion of 48.9 percent, followed by those who earn between N5000-N9,999 per month with 17.2 percent. Those who earn N10,000-N14,999 are 9.3 percent, N40,000 above are 4.5 percent. While those who earn N20,000-N24,999, N15,000-N19,999, N30,000-N34,999, N25,000-N29,999 and N35,000-N39,999 constitutes 5.9 percent, 5.1 percent, 3.7 percent, 3.4 percent and 2.0 percent in that order.

Table 4.5: Distribution of Respondents according to Income Levels

Income level	**Frequency**	**Percentage**
Less than N5000	173	48.9
N5000-N9,999	61	17.2
N10,000-N14,999	33	9.3
N15,000-N19,999	18	5.1
N20,000-N24,999	21	5.9
N25,000-N29,999	12	3.4
N30,000-N34,999	13	3.7
N35,000-N39,999	7	2.0
N40,000 Above	16	4.5
Total	**354**	**100.0**

Source: Field survey, 2012

The high proportion of the unemployed respondents is probably responsible for the high proportions that earn less than N5000 per month. This figure is invariably tied to the level of education which definitely will affect the accessibility of the medical services.

4.2.9 Household Size of Respondents

Table 4.7 shows that most of the households have between one and five persons with about 70.6 percent of the respondents. While 29.1 percent of the respondents have between 6-10 persons currently living in the house, only 0.3% of households has between 11-15 persons currently in the house. Reves (1985) suggested that the number of persons in a household, especially young household members (i.e susceptibles) is more important factors in the household risk of infection than the size of the house. Large family size with many children increases the probability for infection at low age. Low age at infection, in turn may be associated with a high mortality rate in infectious disease.

Table 4.6 Distribution by Respondents according to Household Size

Household Size	Frequency	Percentage
1 – 5	250	70.6
6 – 10	103	29.1
11 – 15	1	0.3
Total	**354**	**100.0**

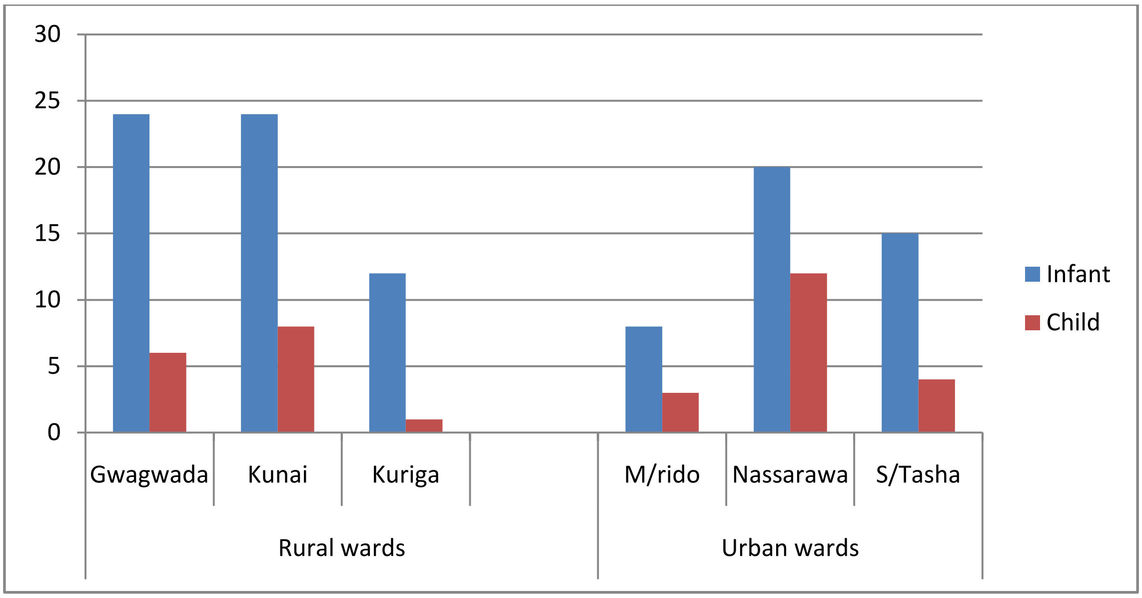
Source: Field survey, 2012

4.2.10 Place of Residence

The place of residence of the mother affects the survival and nutritional status of the living children in developing countries. Figure 4.1 shows the distribution of mothers by place of residence. Therefore,the findings on infant and child mortality differential in the rural wards reveal that 40 percent in Gwagwada, Kunai and 20 percent in Kuriga of the mothers have experienced infant mortality. While 40 percent in Gwagwada, 53.3 percent in Kunai and only 6.7 percent in Kuriga have experienced child mortality.Apart from lack of medical care facilities for infants and children in rural areas, certaincultural practices, beliefs and norms also militate against infant and child survival.

For the respondents in the urban wards who have experienced infant mortality, the result shows that maraban rido had 18.6 percent, nassarawa had 46.5 percent and sabon tasha had 34.9 percent. And the result for those who had child mortality shows maraban rido had 15.8 percent, nassarawa had 63.2 percent and sabon tasha had 21.0 percent. This result show rural-urban differentials in infant and child mortality. The differentials in mortality show that while there are higher infant mortality and child mortality in the rural areas than the urban areas. This can be attributed to the disparities in favour of urban areas in the distribution of facilities necessary for maintaining adequate health.

Figure 4.5: Bar chart showing distribution by residence of respondents



Source: Field survey, 2012

Generally, the type of place of residence is also an important determinant of child survival. Kabir and Chowdhury (1993) explained that urban-rural differentials may be attributed to different health care services including higher coverage with immunization, safe delivery of births and access to health care services. Also several studies, Mahmood (2002), Sastry (2004), Nannan et al (2007) and Machado and Hill (2005) showed that having a mother who lives in the developed community reduced the odds of infant and child mortality. They concluded that community infrastructure may improve hygiene practices. Furthermore, interactions between friends and neighbours in the community may lead to changes in behavior regarding infant care and in this case better off communities may benefit from the overall level of community education.

4.2.11 Antenatal Care of Respondents

Table 4.9 shows that most of the respondents in the study area attended antenatal care (ANC) service. Majority of the respondents (95.2 percent) have access to antenatal care services as compared to 4.8 percent. The results indicate that the mothers haven attended antenatal care reduces the risk of mortality for both infants and children. However, the time it takes during each visit for respondents to access antenatal care also shows that a large number of the women accounting for 68.6 percent of the respondents spend between 1-2 hours during each visit. While about 21.8 percent of the women spend less than 30minutes in each visit, 11.6 percent spend 3-4 hours during each visit for antenatal care services, 2.8 percent spend 5-6 hours during each visit to the health facilities for antenatal care, only 0.3 percent spend about 7 hours. However, the findings confirm that Antenatal care (ANC) attendance is an important element of a comprehensive maternal health strategy (Henry, 2011). Utilization of ANC provides opportunities for a full range of health promoting services that may include weight and blood pressure measurement, screening and treatment for syphilis, preventive and presumptive treatment of malaria in pregnancy and health education, prevention of mother-to-child transmission of HIV. Most importantly, ANC represents an opportunity to counsel women about possible serious complications of pregnancy and delivery and to promote institutional delivery. At each ANC visit, women are asked whether they have experienced any of these complications and they can be reminded what to do if any occur.

Table 4.7 Distribution of Respondents according to Antenatal Care Attendance

Respondents that Attended ANC Clinic	Frequency	Percentage
Yes	337	95.2
No	17	4.8
Total	**354**	**100**
Time Spent at ANC Clinic		
Less than 30mins	77	21.8
1-2hours	225	68.6
3-4hours	41	11.6
5-6hours	10	2.8
7hours & above	1	0.3
Total	**354**	**100.0**

Source: Field survey, 2012

4.3 INFANT AND CHILD MORTALITY AMONG RESPONDENTS

To understand the infant and child mortality differentials among respondents, some selected variables were cross tabulated. These are; age at first birth, marriage status, educational attainment, income per month, number of children ever born (CEB) and number of children surviving as shown in the table 4.10 to table 4.16.

4.3.1 Bivariate Analysis of Infant and Child Mortality Differentials

To understand the determinants of infant and child mortality differentials, some variables were cross-tabulated as shown in Table 4.11.The bivariate analysis shows that for the infant and child mortality among mothers age at first birth, infant mortality was higher than child mortality among the mothers below 29 year. Among the mothers who are married, infant mortality is higher than child mortality. Also, the distribution by educational level shows that, infant mortality is higher than child mortality among mothers with higher educational attainment. This is in contrast with many studies (Hobcraft, 1993 and Mahzous, 2009) that show that the higher the level of maternal education, the lower the incidence of infant and child mortality.

The distribution of infant and child mortality by income level shows that the mothers without constant income experienced the highest mortality (5.6 percent) as compared to those with low income level of N5,000-N9,999 who experienced child mortality (2.8 percent). This implies that income level influence infa `nt and child survival through access to services that affect the health of the children.

For the children ever born, Table 4.11 reveals that the infant mortality is 5.6 percent, while, child mortality is 5.4 percent. As observed, infant and child mortality is highest among those who have five and above children ever born. Likewise, the mothers with three children surviving have experienced the highest infant mortality (6.2 percent) and child mortality (3.7 percent).

Table 4.8 Bivariate Analysis of Infant and Child Mortality Differentials

S/No.	Characteristics	Total=354	Infant Mortality(%)	Child Mortality(%)
a)	**Age at first birth**			
	10-14yrs	26	2.3	1.1
	15-19yrs	56	4.8	0.6
	20-24yrs	144	9.9	3.4
	25-29yrs	107	4.2	1.4
	30-34yrs	19	0.3	0.0
	34yrs Above	2	0.3	0.0
	Total	**354**	**21.8**	**6.5**
b)	**Marital Status**			
	Single	8	1.4	0.8
	Married	340	20.3	2.3
	Separated	5	0.0	0.0
	Divorced	1	0.0	0.0
	Total	**354**	**21.7**	**3.1**
c)	**Educational Attainment**			
	Tertiary	99	3.7	1.1
	Secondary	174	8.8	3.1
	Primary	56	5.1	3.4
	No education	22	4.0	1.1
	Others	3	0.3	0.3
	Total	**354**	**21.9**	**9.0**
d)	**Income Level**			
	≥5,000	56	4.0	1.7
	5,000-9,999	61	4.8	2.8
	10,000-14,999	33	2.5	1.4
	15,000-19,000	18	1.4	0.3
	20,000-24,999	21	1.4	0.6
	25,000-29,000	12	0.3	0.8
	30,000-34,999	13	1.4	0.3
	35,000-39,999	7	0.0	0
	40,000 Above	16	0.3	0.3
	None	117	5.6	1.7
	Total	**354**	**21.7**	**9.9**
e)	**Children Ever Born (CEB)**			
	One	76	0.3	0.3
	Two	97	3.4	0.3
	Three	74	5.4	1.4
	Four	47	4.2	2
	Five	60	5.6	5.4
	Total	**354**	**18.9**	**9.6**
f)	**Children Surviving**			
	One	91	5.1	0.8
	Two	109	5.6	1.4
	Three	83	6.2	3.7
	Four	49	4.2	3.4
	Five	22	0.8	0.3
	Total	**354**	**21.9**	**9.6**

Source: Field survey, 2012

4.3.2 Infant/Child Mortality by Marital Status

Table 4.12 shows that the distribution of infant and child mortality by marital status of respondents. The result shows that 75.7 percent of the respondents who are married never experienced infant death, 0.29 percent of the respondents who are single mothers had the highest infant deaths of five. Also, Table 4.12(bottom panel) gives a chi-square value of 4.834. The critical value with 12 degrees of freedom at 0.05 level of significance is 21.026. We can conclude therefore that the observed association between infant mortality and marital status is statistically insignificant. That is marital status is not critical in determining infant mortality.

While most (87.85 percent) of the respondents who are married never experienced child death. 0.56 percent of the respondents who are single experienced death of two children. The chi-square analysis between marital status and child mortality shows there is no significant relationship. While the chi-square value is 1.146, the critical value with degree at 0.05 level of significance is 12.59.We can conclude therefore that marital statusis not a critical determinant of child mortality.

This therefore shows that single parent experience more infant and child mortality probably due to low socioeconomic status vis-a-vis lack of means for transportation to institutional care, inability to pay for services and resistance among some populations to modern health care are key factors behind the high rate of child mortality and morbidity. Also, this confirms United Nations (UN,1983) possible explanation that, socio-economic status is higher among married women than any marital category as a result of higher family income. Widowhood and divorce are associated with substantial stress both economic and social, which in turn affect infant health and survival.

Table 4.9: Distribution of Infant/Child Mortality by Marital Status of Respondents

	None	I	II	III	IV	V	Total
	INFANT MORTALITY						
	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100
Single	(3)0.85	(2)0.56	(1)0.29	(1)0.29	(0)0.0	(1)0.29	(8)2.26
Married	(268)75.71	(53)14.97	(19)5.37	(0)0.00	(0)0.00	(0)0.00	(340)93.73
Separated	(5)1.41	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(5)1.41
Divorced	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(1)0.29
Total	**(277)78.26**	**(55)15.53**	**(20)5.66**	**(1)0.29**	**(0)0.0**	**(1)0.29**	**(354)100**
	CHILD MORTALITY						
Single	(5)1.41	(1)0.29	(2)0.56	(0)0.0	(0)0.0	(0)0.0	(8)2.26
Married	(311)87.85	(29)8.19	(0)0.00	(0)0.0	(0)0.0	(0)0.0	(340)93.73
Separated	(5)1.41	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(5)1.41
Divorced	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(1)0.29
Total	**(322)90.96**	**(30)8.48**	**(2)0.56**	**(0)0.0**	**(0)0.0**	**(0)0.0**	**(354)100**

	Calculated X^2	**Critical X^2 (P=0.05)**	**Degree of Freedom**
Infant Mortality	4.834	21.026	12
Child Mortality	1.146	12.592	6

Source: Field survey, 2012

4.3.3 Infant/Child Mortality by Age at First Birth

Table 4.13 shows the distribution by age at first birth of the respondents who have experienced infant and child mortality. It reveals that 30.8 percent of the respondents within 20-24 years of age at first birth never experienced infant mortality, while 0.29 percent between 10-14 years of age at first birth experienced the highest infant mortality of five and above. The chi-square analysis between infant mortality and age at first birth is statistically significant. Table 4.13 (bottom panel) gives a chi-square value of 46.762. The critical X^2 value with 28 degrees of freedom at 0.05 level of significance is 41.337. It can be concluded therefore that the association observed above i.e between infant mortality I statistically significant. This means the excess risk of dying among children born at young maternal age is partly due to physical immaturity, lack of child care skills and access to health care service.

Also, 37.29 percent between 20-24 years of age at first birth never experienced child mortality compared with the respondents between 15-19 years of age at first birth who had the highest child mortality of three children. The chi-square value is 16.555 and the critical value with 14 degrees of freedom at 0.05 level of significance is 23.685. We can conclude statistically that there is insignificant association between child mortality and age at first birth. This is in contrast with the findings by Hobcraft *et 'al* (1985) that mortality was clearly higher among children of teenage mothers.

Also as observed, the age of the mother at the time of the first birth is an important factor for infant and child survival. Mondal *et 'al* (2009) using multivariate logistic regression analysis found that the most significant predicators of neonatal and child mortality levels are mothers' age at birth along with other covariates such as immunization, ever breast feeding and birth interval.

Table 4.10: Distribution of Infant/Child Mortality by Age at first birth of Respondents

				INFANT MORTALITY			
	None	**I**	**II**	**III**	**IV**	**V**	**Total**
	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100
10-14	(18) 5.1	(4)1.13	(3)0.85	(0)0.0	(0)0.0	(1)0.29	(26)7.37
15-19	(39)11.0	(11)3.11	(5)1.42	(1)0.29	(0)0.0	(0)0.0	(56)15.82
20-24	(109)30.8	(27)7.63	(8)2.26	(0)0.0	(0)0.0	(0)0.0	(144)40.69
25-29	(92)26.0	(12)3.39	(3)0.85	(0)0.0	(0)0.0	(0)0.0	(107)30.24
30-34	(18)5.1	(0)0.0	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(19)5.39
34 above	(1)0.29	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(2)0.58
Total	**(277)78.3**	**(55)15.15**	**(20)5.67**	**(1)0.29**	**(0)0.0**	**(1)0.29**	**(354)100**
				CHILD MORTALITY			
10-14	(22)6.22	(3)0.85	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(26)7.37
15-19	(44)12.43	(10)2.83	(1)0.29	(1)0.29	(0)0.0	(0)0.0	(56)15.82
20-24	(132)37.29	(12)3.39	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(144)40.69
25-29	(103)29.10	(5)1.42	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(107)30.24
30-34	(19)5.37	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(19)5.39
34 above	(2)0.58	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(2)0.58
Total	**(322)90.98**	**(30)8.49**	**(2)0.58**	**(1)0.29**	**(0)0.0**	**(0)0.0**	**354)100**

	Calculated X^2	**Critical X^2 (P=0.05)**	**Degree of Freedom**
Infant Mortality	46.762	41.337	28
Child Mortality	16.555	23.685	14

Source: Field survey, 2012

4.3.4 Infant/Child Mortality with Educational Attainment

Education is one of the most influential factors in differentiating the infant and child mortality among all the socioeconomic factors. Mother's education seems to be directly related with the health of a child. There is no doubt that an educated mother can provide better care of child than the mother with no education or a lower level of education. Education makes a mother socially advanced, free from traditional values and changes her pattern of behaving and attitude.

The distribution of respondents by educational attainment in Table 4.14 shows that 40.4 percent of the respondents with secondary level of education experienced fewer cases of infant mortality, while 0.29 percent with no formal education experienced the highest infant mortality of five and above. Interms of child mortality, 46.05 percent with secondary education have not experienced any case of child mortality, while 0.27 percent with primary education had mortality of two children. The chi-square analysis between infant and child mortality and level of education was found to be statistically significant at 0.05 level. For infant mortality, the bottom panel of Table 4.14 yields a chi-square of 51.277. The critical X^2 value with 16 degrees of freedom at 0.05 level of significance is 26.296. While for the child mortality, the calculated value is 23.384. The critical X^2 value with 8 degrees of freedom at 0.05 level of significance is 15.507. The significance relationship implies that maternal education has been identified as one of the most important socioeconomic determinants of infant and child mortality.

Maternal education has been identified as one of the most important socioeconomic determinants of infant and child mortality. Many studies showed that the higher the level of maternal education the lower the incidence of infant and child mortality. Caldwell (1981) provided three explanations for the phenomenon; more educated mothers become less fatalistic about their children's illnesses, they are more capable of manipulating available health facilities and personnel and they greatly change the traditional balance of familial relationships with profound effects on child care. In addition to these they are more likely to have received antenatal care to have birth with some medical attendance, and to have taken their children at some time to see a physician (Mahfouz, 2009).

However, some studies have shown that the association between mother's education and child survival were weaker in sub-Saharan African than in Asia or particularly Latin America, where socioeconomic differentials were generally higher. The reason for this kind of association is unknown;however Hobcraft (1993) suggested that perhaps health infrastructures are weaker in sub-Saharan Africa, thereby inhibiting the ability of more educated mothers to take advantage of their human capital in the health environment. Different researchers suggest pathways whereby mother's education might enhance child survival. Cleland (1990) concluded that education may have a modest effect on health knowledge and belief.

Table 4.11: Distribution of Infant/Child Mortality by Educational Attainment of Respondents

	None	I	II	III	IV	V	Total
				INFANT MORTALITY			
	None	**I**	**II**	**III**	**IV**	**V**	**Total**
	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100
Tertiary	(86)24.3	11)3.11	(1)0.29	(1)0.29	(0)0.0	(0)0.0	(99)27.97
Secondary	(143)40.4	(26)7.35	(5)1.42	(0)0.0	(0)0.0	(0)0.0	(174)49.15
Primary	(38)10.74	(8)2.26	(10)2.83	(0)0.0	(0)0.0	(0)0.0	(56)15.82
No Education	(8)2.26	(9)2.55	(4)1.13	(0)0.0	(0)0.0	(1)0.29	(22)6.21
Other	(2)0.57	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(3)0.85
Total	**(277)78.27**	**(55)15.56**	**(20)5.67**	**(1)0.29**	**(0)0.0**	**(1)0.29**	**(354)100**
				CHILD MORTALITY			
Tertiary	(95)26.84	(4)1.13	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(99)27.97
Secondary	(163)46.05	(11)3.11	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(174)49.15
Primary	(44)12.43	(10)2.83	(2)0.57	(0)0.0	(0)0.0	(0)0.0	(56)15.82
No Education	(18)5.1	(4)1.13	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(22)6.21
Other	(2)0.57	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(3)0.85
Total	**(322)90.99**	**(30)8.50**	**(2)0.57**	**(0)0.0**	**(0)0.0**	**(0)0.0**	**(354)100**

	Calculated X^2	Critical X^2 (P=0.05)	Degree of Freedom
Infant Mortality	51.277	26.296	16
Child Mortality	23.384	15.507	8

Source: Field survey, 2012

4.3.5 Infant/Child Mortality by Income

Household income is one of the most important determinants of standard of living, economic and social welfare. Table 4.15 shows the distribution of income level among the respondents who have experienced infant and child mortality. It is observed 0.29 percent with of N5,000-N9,999 income level have experienced infant mortality of five and above. Table 4.15 yields a chi-square value of 47.443. The critical value with 36 degrees of freedom at 0.05 level of significance is 43.773. The conclusion can be therefore that the observed association between income level and infant mortality is significant statistically.

Likewise 31.36 percent without income level have not experienced child mortality and 0.29 percent with N5,000-N9,999 income level experienced child mortality of five and above. This result is in sharp contrast with Mahfouz et al (2009) who found that low income affects the accessibility of medical services. However, Table 4.15 reveals that for the child mortality, the chi-square value of 19.744. The critical value with 18 degrees of freedom at 0.05 level of significance is 28.869. We can conclude that the association between child mortality and income level is not statistically significant. This implies that income level does not determine child mortality in the study area.

Therefore, household economic status which is often measured interms of household per capital income influence infant and child survival through access to the goods and services that affect the health of children. Such goods and services include access to adequate food supply, health and medical services, clothing, good shelter and ownership of certain goods.

Table 4.12: Distribution of Infant/Child Mortality by Income of Respondents

	INFANT MORTALITY						
	None	**I**	**II**	**III**	**IV**	**V**	**Total**
	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100
Less than 5000	(42)11.87	(10)2.83	(4)1.13	(0)0.0	(0)0.0	(0)0.0	56)15.82
5000-9,999	(44)12.43	(12)3.39	(5)1.42	(0)0.0	(0)0.0	(1)0.29	(61)17.52
10,000-14,999	(24)6.78	(3)0.85	(5)1.42	(1)0.29	(0)0.0	(0)0.0	(33)9.32
15,000-19,999	(13)3.68	(4)1.13	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(18)5.08
20,000-24,999	(16)4.52	(3)0.85	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(21)5.90
25,000-29,999	(11)3.11	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(12)3.39
30,000-34,999	(8)2.26	(5)1.42	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(13)3.67
35,000-39,999	(7)1.98	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(7)1.98
40,000- Above	(15)4.24	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(16)4.52
None	(97)27.41	(16)4.52	(4)1.13	(0)0.0	(0)0.0	(0)0.0	(117)33.05
Total	**(277)78.28**	**(277)78.28**	**(20)5.68**	**(1)0.29**	**(0)0.0**	**(1)0.29**	**354) 100**
	CHILD MORTALITY						
Less than 5000	(50)14.13	(6)1.70	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(56)15.82
5000-9,999	(51)14.41	(10)2.83	(0)0.0	(0)0.0	(0)0.0	(1)0.29	(61)17.52
10,000-14,999	(29)8.20	(3)0.85	(1)0.29	(1)0.29	(0)0.0	(0)0.0	(33)9.32
15,000-19,999	(17)4.81	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(18)5.08
20,000-24,999	(20)5.65	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(1)0.29	(21)5.90
25,000-29,999	(9)2.55	(3)0.85	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(12)3.39
30,000-34,999	(12)3.39	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(13)3.67
35,000-39,999	(7)1.98	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(7)1.98
40,000- Above	(16)4.52	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(16)4.52
None	(111)31.36	(5)1.42	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(117)33.05
Total	**(322)91.0**	**(30)8.81**	**(2)0.58**	**(1)0.29**	**(0)0.0**	**(1)0.29**	**(354) 100**

	Calculated X^2	Critical X^2 (P=0.05)	Degree of Freedom
Infant Mortality	47.443	43.773	36
Child Mortality	19.744	28.869	18

Source: Field survey, 2012

4.3.6 Infant/Child Mortality with Children Ever Born (CEB)

It is well known that the proportions of children ever born who have died are indicators of child mortality and can yield robust estimates of childhood mortality level. Tables 4.16 show the distribution of infant and child mortality by children ever born (CEB). It reveals that 24.02 percent of the respondents with two children ever born children have not experienced infant mortality while 0.29 percent of the respondents with one child ever born experienced infant mortality. Table 4.16 yields a chi-square value of 72.102. The critical X^2 value with 16 degrees of freedom at 0.05 level of significance is 26.296. The observed association between infant mortality and the children ever born is statistically significant. This implies that that children ever born is a critical determinant in infant mortality.

Also, 27.12 percent with two children ever born have not experienced child mortality, while 0.57 percent with five children ever born experienced cases of mortality of two children. As observed, those with few children ever born had more number of infants and children under five year compared to those respondents with more children ever born. The chi-square analysis in Table 4.16 yields a value of 19.744. The critical X^2 value with 18 degrees of freedom at 0.05 level of significance is 28.869. This shows there is no significant association between children ever born and child mortality, therefore we can conclude that children ever born is not a critical determinant of child mortality.

However, this high proportion with no infant mortality and child mortality among most respondents could be as a result of under reporting of death. This is consistent with United Nations (1983) findings that in certain cultures, women appear to be more likely to state duration of marriage correctly than to give correct information about their age, so the estimation procedure based on data classified by duration of marriage may be preferred.

Table 4.13: Distribution of Infant/Child Mortality by Children Ever Born (CEB) of Respondents

				INFANT MORTALITY			
	None	**I**	**II**	**III**	**IV**	**V**	**Total**
	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100
One	(75)21.19	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(1)0.29	(76)21.47
Two	(85)24.02	(12)3.39	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(97)27.40
Three	(55)15.54	(15)4.24	(4)1.13	(0)0.0	(0)0.0	(0)0.0	(74)20.90
Four	(32)9.04	(10)2.83	(5)1.42	(0)0.0	(0)0.0	(0)0.0	(47)13.28
Five	(30)8.48	(18)5.09	(11)3.11	(1)0.29	(0)0.0	(0)0.0	(60)16.95
Total	**(277)78.24**	**(55)15.55**	**(20)5.66**	**(1)0.29**	**(0)0.0**	**(1)0.29**	**(354)100**
				CHILD MORTALITY			
One	(76)21.47	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(1)0.29	(76)21.47
Two	(96)27.12	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(97)27.40
Three	(69)19.50	(5)1.42	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(74)20.90
Four	(40)11.30	(7)1.98	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(47)13.28
Five	(41)11.59	(17)4.81	(2)0.57	(0)0.0	(0)0.0	(0)0.0	(60)16.95
Total	**(322)90.98**	**(30)8.50**	**(2)0.57**	**(0)0.0**	**(0)0.0**	**(1)0.29**	**(354)100**

	Calculated X^2	**Critical X^2 (P=0.05)**	**Degree of Freedom**
Infant Mortality	47.443	43.773	36
Child Mortality	19.744	28.869	18

Source: Field survey, 2012

4.3.7 Infant/Child Mortality and Children Surviving

Child survival is closely linked to the timing, spacing and number of births and to the reproductive health of mothers. Early, late, numerous and closely spaced pregnancies are major contributors to high infant and child mortality and morbidity rate, especially where health-care facilities are scare. Tables 4.17 shows the distribution of infant and child mortality by children surviving in the study area. It reveals that 25.14 percent of the respondents with two children surviving do not experienced infant mortality, however 0.29 percent of both the respondents with one child and four children surviving experienced the highest infant mortality of five and above.

Table 4.17 yields X^2 value of 14.375. The critical X^2 value with16 degrees of freedom at 0.05 level of significance is 26.296. We can conclude therefore that the observed association between children surviving and infant mortality is statistically not significant.

For the child mortality, 29.39 percent of the respondents with two children surviving do not experience mortality, while 0.29 percent of the respondents with one child surviving have experienced the highest child mortality of five and above. The X^2value is 24.184 and the critical X^2value with 8 degrees of freedom at 0.05 level of significance is 15.507. Therefore, the observed association between children surviving and child mortality is significant statistically. This implies that child mortality is a critical determinant of child survival.

Table 4.14: Distribution of Infant/Child Mortality by Children Surviving of Respondents

	INFANT MORTALITY						
	None	**I**	**II**	**III**	**IV**	**V**	**Total**
	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100	(n=354)100
One	(75)20.9	(75)20.9	(4)1.13	(0)0.0	(0)0.0	(1)0.29	(91)25.71
Two	(89)25.14	(14)3.95	(5)1.42	(1)0.29	(0)0.0	(0)0.0	(109)30.79
Three	(61)17.23	(15)4.24	(7)1.98	(0)0.0	(0)0.0	(0)0.0	(83)24.45
Four	(34)9.60	(11)3.11	(3)0.85	(0)0.0	(0)0.0	(1)0.29	(49)13.84
Five	(19)5.37	(2)0.56	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(22)6.21
Total	**(277)78.24**	**(55)15.53**	**(20)5.67**	**(1)0.29**	**(0)0.0**	**(2)0.58**	**(354)100**
	CHILD MORTALITY						
One	(89)25.14	(2)0.56	(0)0.0	(0)0.0	(0)0.0	(1)0.29	(91)25.71
Two	(104)29.39	(5)1.42	(5)1.42	(0)0.0	(0)0.0	(0)0.0	(109)30.79
Three	(70)19.77	(12)3.39	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(83)24.45
Four	(38)10.73	(10)2.83	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(49)13.84
Five	(21)5.93	(1)0.29	(0)0.0	(0)0.0	(0)0.0	(0)0.0	(22)6.21
Total	**(322)90.96**	**(30)8.49**	**(2)0.58**	**(0)0.0**	**(0)0.0**	**(0)0.29**	**(354)100**

	Calculated X^2	**Critical X^2 (P=0.05)**	**Degree of Freedom**
Infant Mortality	14.375	26.296	16
Child Mortality	24.184	15.507	8

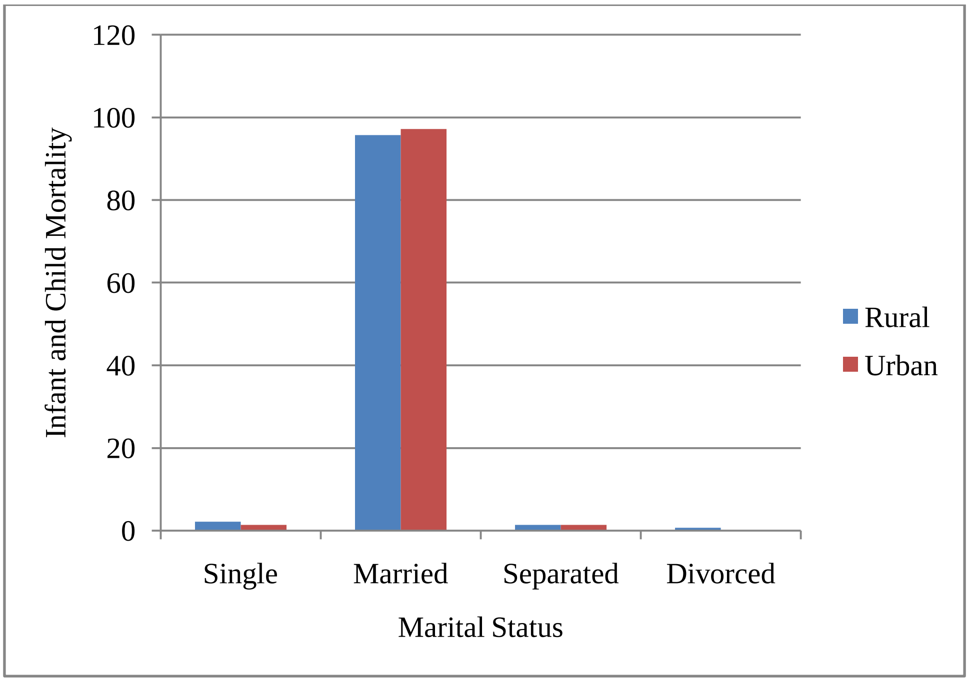
Source: Field survey, 2012

4.4 Urban-rural differential in Infant and Child Mortality

The place of residence of the mother affects the survival status and nutritional status of children. Figures 4.6 to 4.11 below depict distribution of deaths mainly by selected variables. These data provide significant evidence for the differences between urban and rural areas in socioeconomic and demographic indicators like marital status, age at first birth, educational attainment, income level, children ever born and children surviving.

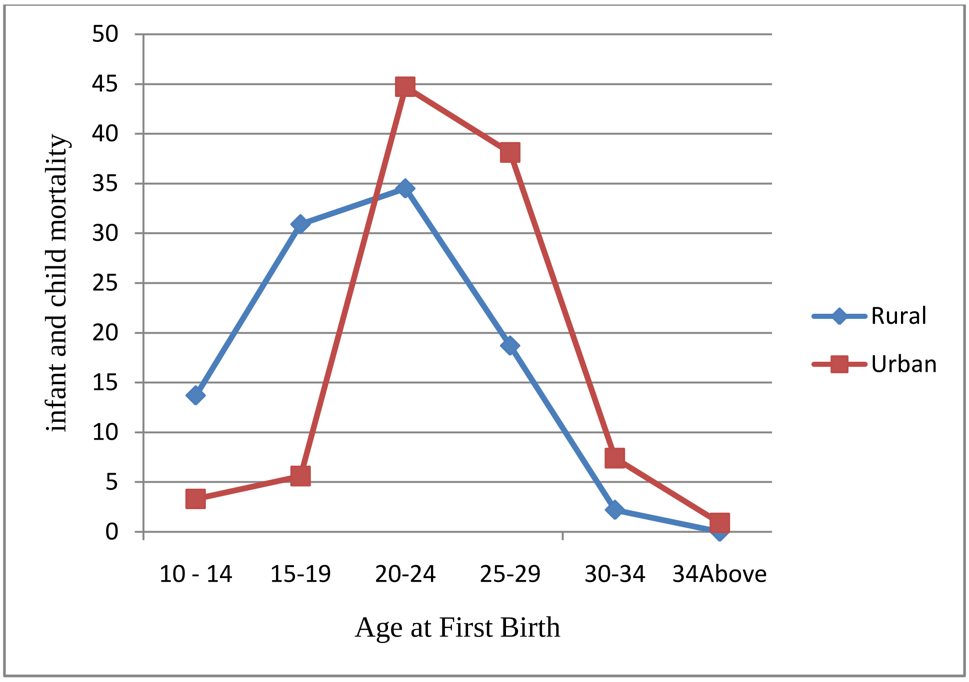
Figures 4.6 shows that infant and child mortality rate were slightly higher in the urban area (97.2 percent) than rural area (95.7 percent) among mothers who are married. The possible explanations for this result is in contrast with United Nations (2007) that socioeconomic status is higher among married women than any marital category as a result of higher family income. Widowhood and divorce are associated with substantial stress both economic and social, which in turn affect infant health and survival.

Figure 4.6 Distribution showing urban-rural differential by marital status



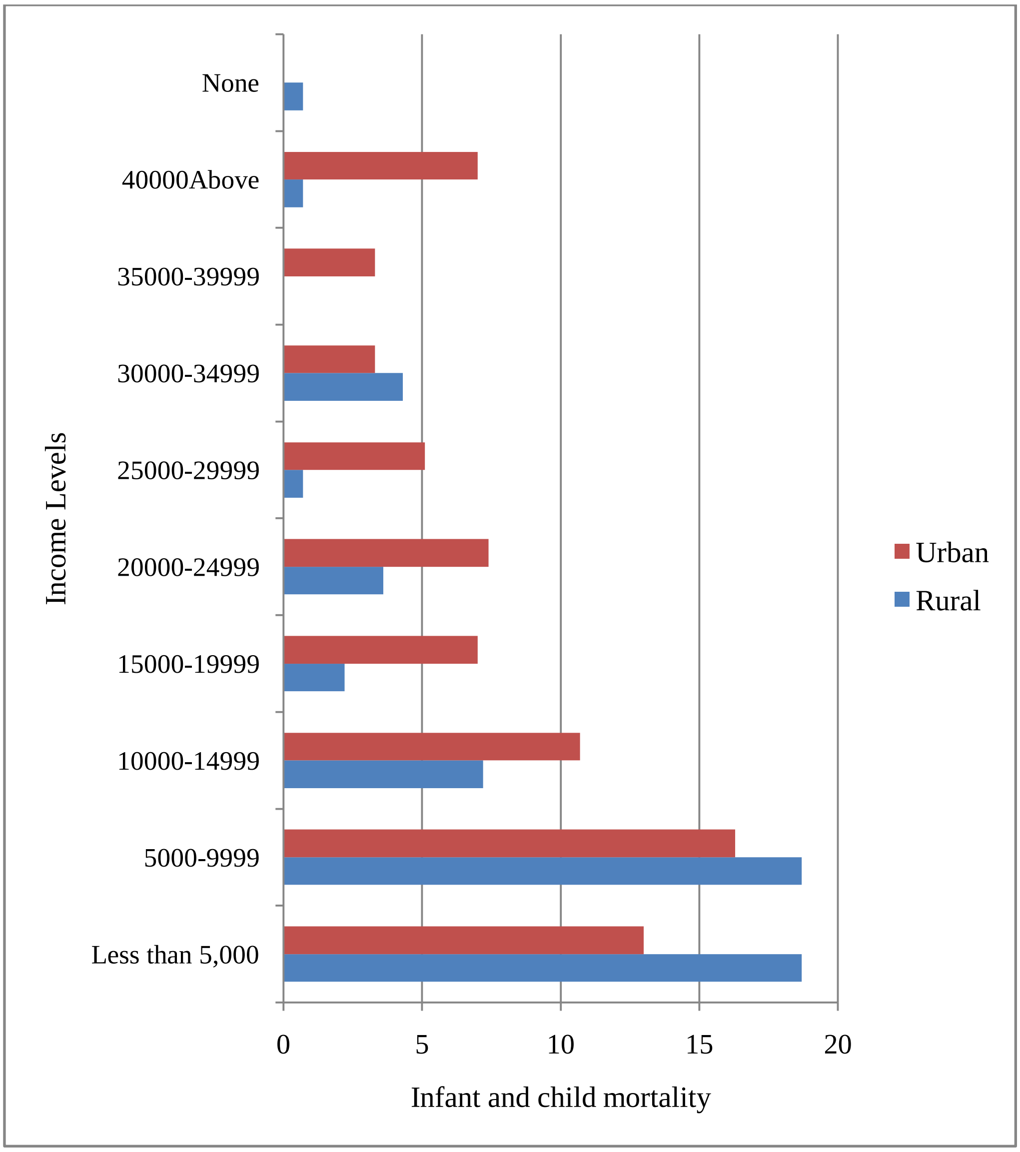
Figures 4.7reveals that infant and child mortality rate were higher in the urban area among mothers aged 20-24 years (44.7 percent). However about 44.6 percent of mortality occurred among adolescent mothers in the rural areas. It is imperative to note that in each of all the age groups identified in the analysis, children of adolescent mothers consistently have higher rates of childhood mortality compared to children of older mothers in the study location. This is consistent with the studies of Aguirre (1995), that maternal age has a U-shaped relationship with child mortality. In effect, both coefficients age and age squared are statistically significant and have the expected direction. That is, the risk of child mortality for children under age two is higher when women are either too young or too old, once parity and other reproductive factors are controlled for.

Figure 4.7 Distribution showing urban-rural differential by age at first birth



Household income is one of the most important determinants of the standard of living, economic and social welfare. In rural area, there is hardly economic venture that generate income. Therefore, one would expect high rate of mortality as seen in Figure 4.8 which shows about 37.4 percent of the mothers in rural area that earned less than N10,000 who experienced high infant and child mortality than those in the urban .

Figure 4.8 Distribution showing urban-rural differential by Income level



Generally, infant and child mortality is higher among mothers with secondary education as presented in Figure 4.9, the incidence varied with urban area to have experienced 88.9 percent higher than rural area (59.8 percent) among the mothers with post secondary education, probably due to the few number of persons with formal education in the rural area Adetunji (1995) in his studies showed that infant mortality is higher in those born to mothers with secondary education compared to uneducated mothers. He suggested that the lower maternal age at birth and less duration of breastfeeding which were associated with this group of women could be responsible for this finding.

Figure 4.9 Distribution showing urban-rural differential by educational level

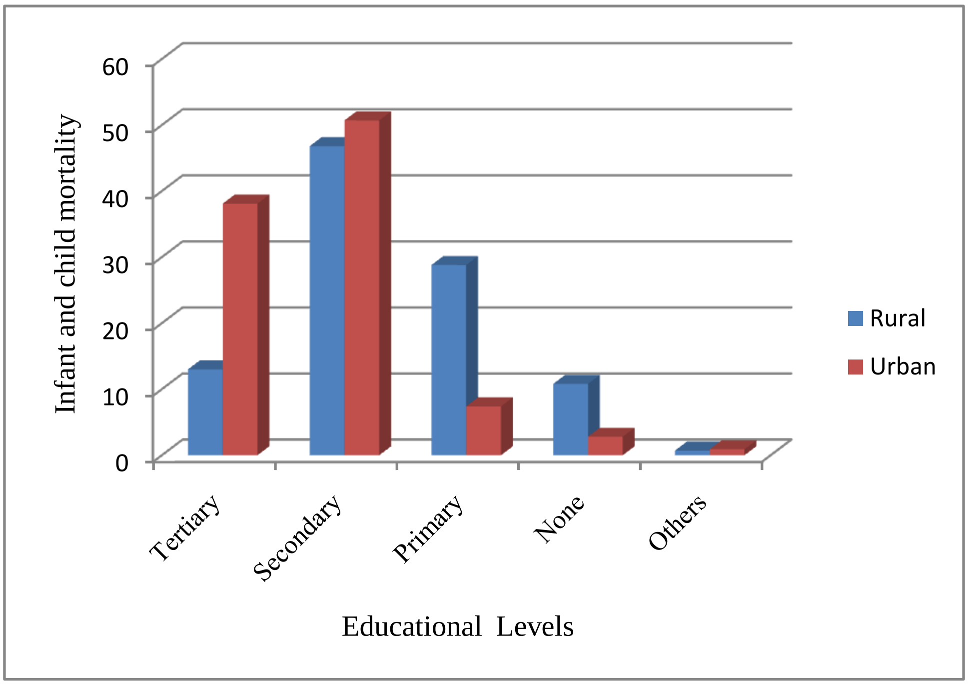


Figure 4.10 shows that 27.3 percent of the mothers who reside in the rural area, experienced more infant and child mortality of five children ever born (CEB). The parity of the mother is higher in the rural area probably due to early marriage, however, due to poor hygiene, nutrition and low living standard, children especially under-five are at risk of death.

Figure 4.10 Distribution showing urban-rural differential by Children Ever Born

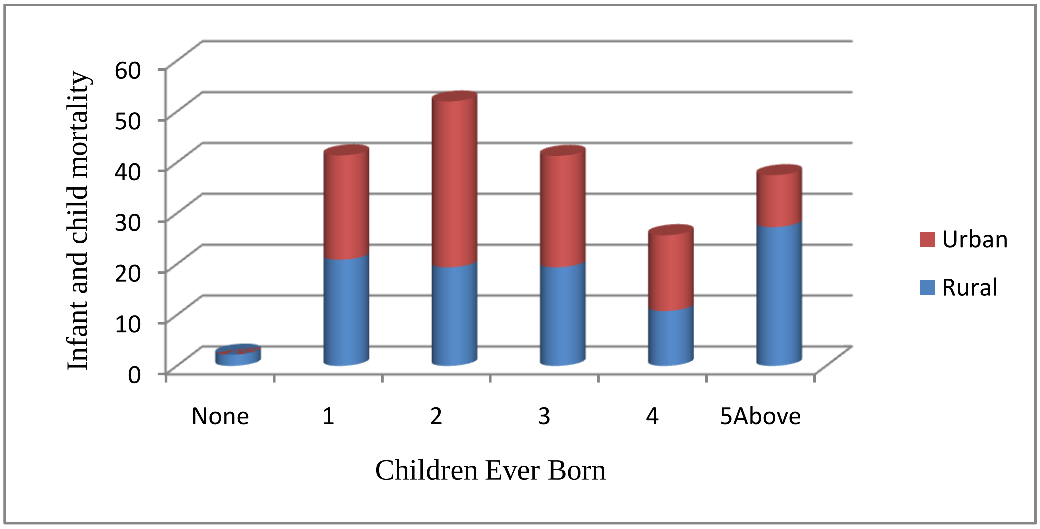
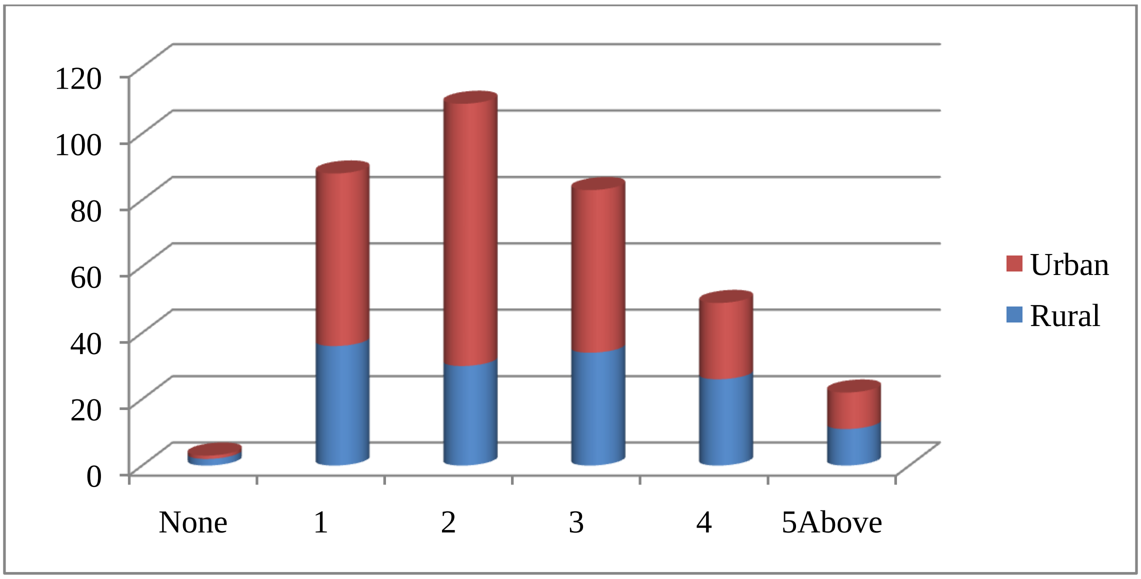


Figure 4.11 shows that for the children surviving, it is higher in the rural area with 7.9 percent compared to urban area (5.1 percent). This explains that the high parity in the rural area is probably due to early marriage as seen in Figure 4.6 where most of the infant and child mortality occurred among the adolescent who had high birth order.

Figure 4.11 Distribution showing urban-rural differential by Children Surviving



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

The study analyzed the infant and child mortality differentials in Chikun Local Government Area among socio-economic groups. The background characteristics of the respondents reveal that majority (31.1 percent) are between the age group 25-29 years. The results of the survey revealed that a significant proportion (96.6 percent) were married and most (92.1 percent) practice monogamy type of marriage. The Gbabyi's are the majority of the respondents among the ethnic groups in the study area and Christians constitutes the highest percentage (92.9).

The results of the analysis also show that 49.2 percent have secondary education while 31.9 percent are engaged in business/petty trading. The income levels revealed that 48.9 percent earn less that N5000 in a month and the most of the households have between one and five persons with 70.6 percent. For the distribution by residence, the result shows that infant mortality and child mortality is higher in rural area than urban area. These rural-urban differentials may be attributed to different health care like immunization, safe delivery of births and access to health care services.

The percentage who had accessed to antenatal care shows that majority (95.2 percent) o had accessed, though 68.6 percent of the respondents spend between one to two hours during each visit probably due to inadequate skilled attendants in the health facilities.

For the cross tabulation, the analysis and distribution by infant/child and marital status shows that mothers who are single experience highest mortality of five and above infants and two children under five years as compared to those who are married, widow and separated. For the respondents by infant/child mortality and age at first birth, the result shows that infant and child mortality was higher among teenage mother. Therefore, the excess risk of dying among children born at young maternal age is partly due to physical immaturity, lack of child care skills and access to health care services.

Among the respondents by infant/child mortality and education, the analysis revealed that those with no education had the highest mortality of five and above infants and two children under five years while those mothers post primary education do not experienced both infant and child mortality. Education is the most influenced factor in differentiating the infant and child mortality levels within all the socioeconomic factors. Mother’s education seems to be directly related with the health of a child. There is no doubt that an educated mother can provide better care of child than the mother with no education or a lower level of education. Education makes a mother socially advanced, free from traditional values and changes her pattern of behaving and attitude.

The analysis by infant/child mortality and income per month shows that respondents who earned N20,000 to N24,999 had the highest mortality of five and above infants and children who are under five years, however, respondents without income per month do not experience neither infants nor child mortality. This is a sharp contrast with Mahfouz et al (2009) that low income affect the accessibility of medical services.

For infant/child mortality and children ever born, it was observed that those with few children ever born had more number of infants and children less than five year compared to those respondents with more children ever born. However, this high proportion with no infant mortality and child mortality among most respondents could be as a result of under reporting of death. This is consistent with United Nations (1983) findings that in certain culture, women appear to be more likely to state duration of marriage correctly than to give correct information about their age, so the estimation procedure based on data classified by duration of marriage may be preferred.

For infant/child mortality and children surviving, the study revealed that the respondents with one child surviving had experienced the highest infant and children mortality while the respondents with two and above children surviving do not experienced infant and child mortality.

Mortality interms of urban-rural differentials shows that infant and child mortality rates are slightly higher in the urban areas (97.2 percent) among mothers who are married. Most (88.9 percent) of those with post secondary education in the urban area experienced mortality cases, while mothers who are adolescent (44.6 percent) in the rural area had the highest mortality.

5.2 CONCLUSION

Infant and child mortality rate in the study area varied between socioeconomic groups and between rural and urban residence. The relationship between socioeconomic factors and infant and child mortality suggest that children are more likely to die if their mothers are living in the rural areas, born by teenage mothers with no education and with low standard of living. The problem of high child mortality in the rural areas as compare with the urban areas is a reflection of the lack of health facilities and personnels

According to the findings from the study, it is apparent that education is one of the most influential factors in differentiating the infant and child mortality among all the socioeconomic factors. Mother's education seems to be directly related with the health of a child. There is no doubt that an educated mother can provide better care of child than the mother with no education or a lower level of education. Education makes a mother socially advanced, free from traditional values and changes her pattern of behaving and attitude.

Though income level is also an important determinant of the standard of living, economic and social welfare. The study found significant association between income level and infant and child mortality. About 33.05 percent were classified as group without constant income; this would definitely affect the accessibility of medical service in the study area.

Improvement in the socio-economic and development programmes is a panacea for achieving low infant and child mortality rate in the study area. The Integrated Maternal and Child Health (MCH) strategy adopted by the State government in 2007 is a positive action plan. The goal of the IMCH strategy is to reduce maternal and child morbidity and mortality at the community and health facility levels in line with the Millennium Development Goals. At full implementation, the IMCH strategy is expected to achieve a reduction of infant and child mortality, thereby reducing the rates significantly. The provision of adequate and accessible health care services is a key factor for child survival. There is high need to expand immunization of children in the rural area and also proper public enlightenment and education of mothers on best health care practices is imperative for infant and child survival.

5.3 RECOMMENDATIONS

In line with the findings that show the demographic and socioeconomic determinants of infant and child mortality differentials in the study area, the following recommendations aimed at reducing the levels of mortality are made;

Girls in the rural area should be encouraged to go to school up to at least secondary level. This will first of all increase age at first birth and therefore reduce child deaths at first birth order. It will also increase the survival of their children since child survival is found to increase with maternal age and level of education in the study area.

Health services should be brought nearer to the communities so that mothers have access to both during pregnancy and after. The impact of delivery a child with the help of a medical professional is enormous. However, this will be useless if mothers do not have access to medicines especially in high HIV/AIDS prevalence population. Administration of antiretroviral (ARVs) to pregnant mothers to prevent mother to child transmission should be enhanced and continually improved.

All policies on maternal and child health developed should be integrated with women empowerment programmes especially through education. Women with low status usually do not fully utilize the facilities provided to them. This could hamper progress even if government improves the health care system.

The government should take the findings into account to ensure sustainability. They should monitor and evaluate existing programmes regularly in order to revise or re-design programmes which are relevant to the factors which are predominant in determining child survival. Until these are applied, significant headway towards achieving Millennium Development Goal four (MDG4) which aims to reduce infant and child mortality by two-third between 1990 and 2015, might be difficult to realize.

Finally, for further studies, It is also recommended that larger samples of primary data on infant and child mortality be collected in the study area to be able to measure the impact of socioeconomic factors on both infant and child mortality. This will guide the policy makers in adopting the appropriate strategies to reduce the infant and child mortalities in the northern regions and the whole country at large

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QUESTIONNAIRE ON ANALYSIS OF INFANT AND CHILD MORTALITY DIFFERENTIALS IN CHIKUN LGA, KADUNA STATE

Dear Respondent,

This questionnaire is design as part of an M.Sc research on "**AN ANALYSIS OF INFANT AND CHILD MORTALITY DIFFERENTIALS IN CHIKUN LGA, KADUNA STATE**". This exercise is purely academic and so any information supplied would be used strictly for that purpose and thus treated strictly as confidential.

SECTION A
DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF RESPONDENT

Location of Respondent: **Gwagwada [ ]**
Kunai [ ]
Kuriga [ ]
Maraban Rido [ ]
Nassarawa [ ]
Sabon Tasha [ ]

1). Age (a) 15-19[ ] (b) 20-24[ ] (c) 25-29 [ ] (d) 30-34 [ ] (e) 35-39[ ] (f) 40-44 [ ] (g) 45-49 [ ] (h) 50 above [ ]

2). Sex (a) Male [ ] (b) Female [ ]

3). Ethnic group (a) Gbabyi [ ] (b) Hausa/Fulani [ ] (c) Igbo [ ] (d) Yoruba [ ] (e) Southern minority [ ] (f) Northern minority [ ] (g) Others (Specify)________________________

4). Religion (a) Christian [ ] (b) Muslim [ ] (c) Traditional/Pagan [ ] (d) Others (Specify) __________________________

5). Marital Status (a) Single [ ] (b) Married [ ] (c) Separated [ ] (d) Divorced [ ]

6). Age at first marriage (a) 10-14 [ ] (b) 15-19 [ ] (c) 20-24 [ ] (d) 25-29 [ ] (e) 30-34 [ ] (f) 34 + [ ]

7). Type of marital union (a) Monogamy [ ] (b) Polygamy [ ] (c) Others (Specify)

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8). Number of years in marital union (a) Less than 2years [ ] (b) 2-4years [ ] (c) 5-7years [ ]

(c) 8-10years [ ] (d) 10years + [ ]
9). Level of Educational Attainment (a) Tertiary [ ] (b) Secondary [ ] (c) Primary/Quranic
[ ] (d) None [ ] (e) Others (Specify)______________________

10). Do you have any gainful employment (a) Yes [ ] (b) No [ ]

11). If Yes (in 10 above), type of employment (a) casual labourer [ ] (b) civil service [ ] (c) Business/Petty trading [ ] (d) farmer [ ] (e) Unemployed [ ] (f) Student [ ] (g) Others (Specify)______________________

12). How long have you been in your present employment (a) Less than 2years [ ] (b) 2-4years [ ] (c) 5-7years [ ] (d) 8-10years [ ] (e) 10year + [ ]

13). Income per month (a) Less than N5000 [ ] (b) N5000-N9000 [ ] (c) N10,000-N14,000 [ ] (d)N15,000-N19,000 [ ] (e) N20,000-N24,000 [ ] (f) N25,000-N29,000 [ ] (g) N30,000 -N34,000 [ ] (h) N35,000-N39,000 [ ] (i) N40,000+ [ ]

14). What type of accommodation do you have? (a) One room [ ] (b) Two rooms [ ] (c) Compound house [ ] (d) Flat/Bungalow [ ] (e) Duplex [ ]

15). Ownership of accommodation (a) Official [ ] (b) Rented [ ] (c) Owned [ ] (d) Squatting [ ] (e) Others, (Specify)_____________________________

16). How many people are currently living in your house? (a) 1-5 [ ] (b) 6-10 [ ] (c) 11-15 [ ] (d) 15 + [ ]

SECTION B
INFANT AND CHILD MORTALITY DIFFERENTIALS

17). Do you have a child less than 5 years. (a) Yes [ ] (b) No [ ]

18). Number of children ever born. (a) None [ ] (b) 1 [ ] (c) 2 [ ] (d) 3 [ ] (e) 4 [ ] (f) 5 above [ ]

Children ever born?

Pregnancy order	Date of Birth (Year only)	Sex of the child
1st		
2nd		
3rd		
4th		

5th		

19). How many of your children have died before the age of one. (a) None [ ] (b) 1 [ ] (c) 2 [ ] (d) 3 [ ] (e) 4 [ ] (f) 5 and above [ ]

Infant mortality experience for the last 5years

Sex of children	Age at death (Month)	Cause of the death

20). How many of your children have died between the ages of 1-5years (a) None [ ] (b) 1 [ ] (c) 2 [ ] (d) 3 [ ] (e) 4 [ ] (f) 5 and above [ ]

Children mortality experience for the last 5years

Sex of children	Age at death	Cause of the death

21). Number of children surviving (a) None [ ] (b) 1 [ ] (c) 2 [ ] (d) 3 [ ] (e) 4 [ ] (f) 5 above [ ]

22). Previous birth interval (a) Less than 2years [ ] (b) 2years [ ] (c) 3years [ ] (d) 4years + [ ]

23). Succeeding birth interval (a) Less than 2years [ ] (b) 2years [ ] (c) 3years [ ] (d) 4years + [ ]

24). Did you breastfeed your last birth? (a) Yes [ ] (b) No [ ]

25). If Yes in (24) above, for how many months did you breastfeed. (a) 1-2 [ ] (b) 3-4 [ ] (c) 4-5 [ ] (d) 6 and above (e) Don't know [ ]

26). If not (24), why did you not breastfeed. (a) Mother ill/weak [ ] (b) Child ill/weak [ ] (c) Child dead [ ] (d) Nipple/breast problem [ ] (e) Not enough milk [ ] (f) Mother working [ ] (g) Child refused [ ] (h) weaning age/age to stop [ ] (i) Became pregnant [ ] (j) Started using contraception [ ] (k) Others (Specify)______________________________

SECTION C
AVAILABILITY OF HEALTH CARE SERVICES

27). Is there any healthcare centre in your place? (a) Yes [ ] (b) No [ ]

28). If Yes (in 29 above), what type is it (a) Dispensary [ ] (b) Clinic [ ] (c) Primary Health Care [ ] (d) Hospital [ ] (e) Herbal/Traditional home [ ] (f) Others (Specify)___________________

29). How far is it from your home (a) Less than 2km [ ] (b) 2-4km [ ] (c) 5-7km [ ] (d) 8-10km [ ] (e) Above 10km [ ]

30). Have you ever given birth in any of the health centre? (a) Yes [ ] (b) No [ ]

31). Where did you give birth to your last child. (a) Home [ ] (b) Health facility [ ] (c) Prayer house [ ] (d) Other (Specify)_______________________

32). Who assisted with the delivery. (a) Health professional [ ] (b) Traditional Birth Attendant [ ] (c) Relative/Friend [ ] (d) Others (Specify)________________________

33). Do the health care centre provide immunization (a) Yes [ ] (b) No [ ]

34). What is status of your child's immunization? (a) Full [ ] (b) Partial [ ] (c) Not at all [ ]

35). Has any of your child fallen sick. (a) Yes [ ] (b) No [ ]

36). How often are your children sick. (a) Always [ ] (b) Occasionally [ ] (c) Not at all [ ]

37). What are the common infant and child diseases in this community. (a) Malaria [ ] (b) Diarrhoea [ ] (c) Dysentery [ ] (d) Pneumonia [ ] (e) Measles [ ] (f) Others (Specify) _______________________

38). Did you report the case of child illness to the healthcare centre? (a) Yes [ ] (b) No

39). If No in (38) above, why? (a) No money [ ] (b) No transport [ ] (c) Healthcare centre located too far away [ ] (d) No need to report [ ] (e) Against our religion [ ] (f) Others (Specify)____

40). Did you receive prompt attention at the healthcare centre? (a) Yes [ ] (b) No [ ]

41). If No in (40) above, why? (a) No skilled health worker [ ] (b) Inadequate facilities in healthcare centre [ ] (c) Poor service delivery [ ] (d) Inconsistent government health programmes [ ]

42). Is the health care centre capable of treating the illness you reported? (a) Yes [ ] (b) No [ ]

43). If No in (42) above, why? (a) Inadequate skilled health workers [ ] (b) Inadequate basic healthcare facilities [ ] (c) Poor service delivery [ ] (d) Inconsistent government and policies [ ] (e) Others (Specify)____

44).What is your impression on how health workers treat their patients? (a) Good [ ] (b) Average [ ] (c) Poor [ ] (d) Very poor [ ]

45). In your opinion, are the health facilities adequate within the health centre. (a) Yes [ ] (b) No [ ]

46). Is there any health facility in your area that provide antenatal care? (a)Yes [ ] (b) No [ ]

47).If Yes in (46) above, during antenatal days in the health care centre, how long does it take before you are attended to during each visit. (a) Less than 30minutes [ ] (b) 1-2hrs [ ] (c) 3-4hrs [ ] (d) 5-6hrs [ ] (e) 7hrs + [ ]

48). Who decides on the treatment you take during pregnancy and childbirth. (a) Mother [ ] (b) Only husband [ ] (c) Mother and husband together [ ] (d) In-laws [ ] (e) Others (Specify) __________________________

49).Are there drugs in the health centre you attend? (a) Yes [ ] (b) No [ ]

50). If yes above, how costly are the drugs? (a) Expensive [ ] (b) Moderate [ ] (c) Cheap [ ]

51). How has the health care centre contributed to the development of your community. (a) Construction of roads [ ] (b) Provision of infrastructure [ ] (c) Improved standard of living [ ] (d) Others (Specify)_____________________

52). What is your source of information about new developments in modern health care delivery? (a) Friends [ ] (b) Mass media [ ] (c) District Head [ ] (d) Government information service [ ] (e) Religious centre [ ] (f) Other (Specify)

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53). What do you think is the problem of health system in your area? (a) Inadequate skilled health worker [ ] (b)Inadequate facilities in healthcare centre [ ] (c) Poor service delivery [ ]   (d) Inconsistent government health programmes and policies [ ]

54). How can these problems be solved. (a) Adequate skilled health worker [ ] (b) Adequate facilities in healthcare centre [ ] (c) Good service delivery [ ] (d) Consistent government health programmes and policies [ ]