THE EFFECTS OF MOTHER'S MIGRATION ON UNDER-FIVE MORTALITY IN KENYA

BY

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DECLARATION

This research project is my own original work and has not been presented to any university for an award of a degree.

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(Q50/80542/2012)

This research project is presented for examination with our approval as University Supervisors.

Dr. Anne Khasakhala …… Date: ……

Dr. Samuel Wakibi …….Date: ……..

DEDICATION

This work is dedicated to my younger sister, Ms. Prisca Achola who lost her new born baby only 20 days after delivery in June, 2014. You were a great inspiration and motivation to me while conducting this study and the memories, however sad, will forever remain with us. I also wish to dedicate the study to my mother, Mrs. Leah Achola and my siblings (Hannington, Jack, Delvine, Lydia, Tyson, Lavenda and Seth) for tirelessly supporting me through my education and motivating me to conduct this study. May God bless you all.

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ABSTRACT

Using the 2008-09 Kenya Demographic Health Survey Data for the whole country and with focus on children below age five, this paper examines the effects of mother's migration status controlling for other proximate factors (socio-economic, environmental and bio-demographic characteristics) on under-five mortality in Kenya. A total of 6079 children born 59 months before the survey are used in the analysis. Cox proportional hazard model was used to assess the effect of mother's migration status (whether migrant or non-migrant) on the survival chances of children under the age of five, controlling for other explanatory variables. The general results of multivariate analysis show that children born of migrant mothers face a higher risk of mortality compared to those of non-migrant mothers. The results of the life table reveal that the probability of death of children of migrant mothers is higher at 0.09 than that of children born of non-migrant mothers 0.07, thus supporting the hypothesis that the survival status of children under the age of five years in Kenya is associated with their mother's migration status.

Generally, mother's migration explains a considerable component of the differentials in child survival before age five in Kenya. Several other factors, including parents' education, mother's current age, birth order, wealth index, mother's, occupation, type of toilet facility and source of water have a significant predictive power on child survival. However, marital status of the mother, wealth index, type of toilet facility and education were found to only affect the migrants. On the other hand, current age of the mother, wealth index, occupation and source of water were found to affect non-migrants.

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CHAPTER ONE

INTRODUCTION

1.1 Background information

Geographic mobility, or migration, has always been an integral part of the social process of the world (Owuor, 2006b). Migration is a form of geographic or spatial mobility between one geographical unit and another, generally involving a change of usual residence from a place of origin or place of departure to the place of destination or place of arrival (Oucho & Oucho, 2010). Distinction is often made between internal migration which occurs within national boundaries and international migration in which movement crosses internationally recognized national borders. In the recent years, studies worldwide have accorded considerable research attention the effects of migration and immigration on the families, (Oucho, 2007; Kamungi, 2009; Burnham, & Hill, 2005; Owuor, 2006b). These studies show that some of the factors that have resulted in increased migration across the world include economic globalization, urbanization, natural calamities, political disasters, and fluidity of labor markets.

Migration forms part of political and social agenda across Africa, Kenya included. The spatial distribution policies adopted by the government of Kenya were aimed at slowing down the rate of rural-urban migration, promoting growth of small and medium-size urban centres, and encouraging rural development (Owuor, 2006b). Some of these policies include; selective dispersal and selective concentration strategy, service centres strategy; rural trade and production centres; district focus for rural development strategy; growth with distribution policy; rural-urban strategy; and more recently, the Local Authority Transfer Fund (LATF) and Constituency Development Fund (CDF) (Kamungi, 2009).

According to the 2009 Housing and Population Census, women dominate the lifetime in-migration stream in Western, Nyanza and Central provinces, as well as lifetime out-migration stream from Central (52%), Nairobi (51%) and Rift Valley provinces (50%).There are also more women recent in-migrants than men in Nairobi, Western and Nyanza provinces; but male recent in-migrants dominate North Eastern and eastern provinces (2009 Housing and Population Census).

This draws to the conclusion that women are highly joining the internal migration stream due to improved access to education and training opportunities; increased participation in labour force and household income generating activities; and greater social and economic empowerment and independence (Owuor, 2006b).

Under-five mortality refers to the probability of dying before the fifth birthday. The under-five mortality levels in Kenya have declined from 115 per 1000 live births in 2003 to 74 deaths in 2008-09, KDHS. The under-five mortality still remains significantly high despite the numerous interventions by the Kenyan government to help reduce the mortality rates. Such steps include the introduction of Primary Health Care (PHC), the Expanded Program on Immunization (EPI), the Integrated Management of Childhood Illness (IMCI), ownership and use of treated mosquito nets, preventive treatment of malaria during pregnancy, and treatment of childhood fever, given that malaria is one of the leading causes of death among young children in Kenya and most of sub-Saharan Africa (Division of Malaria Control, 2009).

Noticeable differences in childhood mortality are observed between rural and urban residence, with the rural under-five mortality rates being higher at 86 than those of urban at 74 deaths per 1,000 live births (KNBS and Macro, 2010). According to the 2008-09 KDHS, variations in early childhood mortality also exist across the various regions in Kenya, with Nyanza province having the highest levels of under-five mortality rate of 149 deaths per 1,000), compared to Central province with 51 deaths per 1,000), which has the lowest rate.

Migration explains a considerable component of the variance in child survival, with other factors, including parents' education, place of residence, region of residence, employment status of the mother, and birth order, among other factors (Onyango et al., 2011). Therefore, a study on the factors associated with under-five mortality with the focus on migration of mothers and the possible differentials in the mortality levels becomes of great use for policy makers, scholars and the administrators in the health sector as the country struggles to achieve the MDG 4 target of reducing childhood mortality to 33 deaths per 1,000 births.

1.2 Problem statement

It has been 14 years since the world leaders committed to Millennium Development Goal 4 (MDG 4), which sets out to reduce the under-five mortality rate by two thirds by 2015. Only less than a year is left before the 2015 deadline. The world has made substantial progress, reducing the under-five mortality rate to 41 percent, from 87 deaths per 1,000 live births in 1990 to 51 in 2011 (UNICEF, 2012). However, this progress has not been good enough, and the target risks being missed, with most Sub-Saharan countries, such as Kenya still having high alarming rates of 74 deaths per 1000 live births, against the global under-five mortality rate target of 29 deaths per 1,000 live births by 2015 (UNICEF, 2012).

With only less than one year to the 2015 MDG deadline, the possibility of meeting the under-five mortality target remains extremely thin, despite past studies having clearly documented and focused on the socio-economic and demographic determinants factors of childhood mortality. These factors include; parents' education, place of residence, region of residence, employment status of the mother, and birth order, among others (Scott et al., 2013; Ssengonzi et al., 2002; J. Kimani, 2012; Omariba, 2007). This therefore leaves the question, could focus on internal migration be the missing determining factor that will help reduce the under-five mortality rates?

Migration effects are not well known and documented, with a closely related study, focusing on the effects of mother's migration on under-two mortality conducted by Onyango et al., 2011; a study that revealed that internal migration can enhance survival chances of children by introducing the migrant mother to new job opportunities or community, good climatic region or better health services. This study therefore, seeks to expand on Onyango's contribution by expanding the scope to under-five mortality, strengthen the findings of under-five mortality differentials of various migration typologies, and to bridge the knowledge gap by generating under-five mortality rates for both migrants and non-migrants in Kenya.

1.3 Research Question

This study intends to answer the following questions:

- How does maternal migration influence under-five mortality?
- Do children of migrant mothers have a higher probability of dying than those of non-migrants?
- What factors are associated with under-five mortality among migrants and non-migrants in Kenya?

1.4 Objectives of the Study

The overall objective of this study is to determine the effect of mothers' migration on survival status of children under the age of five years in Kenya.

The specific objectives include;

(i) To establish the relationship between mothers' migration and the survival status of children up to the age of five in Kenya.

(ii) To estimate the probability of dying for children aged less five for migrants and non-migrants in Kenya.

(iii) To determine the factors associated with under-five mortality among migrants and non-migrants in Kenya.

1.5 Justification of the Study

This section delves into the relevance of the study in terms of academic contributions and practical use that might be made of the findings. It highlights the contributions of the research to other researchers, practitioners and policy makers and implementers. It describes the usage, benefits or advantages that will be derived from the study findings, conclusions and recommendations.

This study examines the effect of mother's migration of survival status of children under the age of five years. Such results are important in the estimation and analysis of regional differentials in early childhood mortality in a number of census and household surveys.

In its contributions to literature, the study seeks to fill an important information gap concerning the levels of under-five mortality for migrants and effect of mothers' migration on under-five mortality. To test for the differential effect of internal migration by stream, this study analyzes the status of migration (whether migrants or non-migrants) that have not been intensively studied before. The study of the migration status of mothers, together with the analysis of the proximate determinants of mortality on under-five in each migrant stream provides a more complete explanatory model of child survival in the country. Moreover, limited literature exists with the information on the proportions of under-five mortality among migrants and non-migrants in Kenya.

From a policy perspective, the study raises pertinent issues concerning the health of a vulnerable population group, which are the infants and children. With almost half of the Kenyan population being the young people between the age of 1 to 34 (Kenya Population and Housing Census, 2009), the health and survival of children under the age of five strongly affects the future generation of the nation. The process of migration is one that impacts the socioeconomic status of a household either positively or negatively.

This study is useful in identifying the most vulnerable group of children in the migration process. In addition, findings from the study have policy implications regarding not only the availability of medical services to the population but also the utilization of such services. Under-five

mortality patterns and differences in the prevalence of infant and child mortality among migrants compared to non-migrants can be helpful in identifying the level of utilization of healthcare services in the place of destination and whether the duration of stay in a place affects access to the health services.

Being that Kenya has no concrete migration policy, the findings from this study will play a key role in providing a justification and a motivation of the government to enact and implement migration policies. This will not only help in the regulation of migration in the country but will also help reduce exposure of migrant children to life threatening conditions due to policy free migration. Such an effort will add to the interventions put in place by the government in order to help to reduce the levels of infant mortality in Kenya. The study findings will also indicate the need to educate migrant groups on the negative impacts of migration to allow them make informed choices that will help save the lives of their children.

1.6 Scope of the study

The study is national and utilizes data drawn from the Kenya Demographic Health Survey, 2008-09. The survey provides detailed information on maternal and child health, mortality, birth histories and characteristics of eligible women within the age range of 15-49. A total of 6079 infants and children born five years before the survey are used in the analysis. The unit of analysis is the child, not the mother. Therefore, a sample of children was created from the female respondent data file in the 2008-09, Child File dataset.

1.7 Limitation of the Study

A major limitation of migration information obtained from data on place of birth is that it is only possible to get the last migrations but not all migrations. Moreover, Demographic and Health Surveys data is less appropriate for time series analysis and there are very few studies available with time varying factors (Becheret al., 2004).

The targeted KDHS data does not give comprehensive information on the exposure time for the occurrence of under-five mortality. The exposure period for under-five mortality is not known. For example, one cannot tell whether the dead children were resident in the place where the mother migrated to or whether they only came because of illness and hence died there.

Demographic and Health Surveys data is also known to be less appropriate for time series analysis and there are very few studies with time varying factors (Becheret al., 2004). It is worth noting that the main limitation of migration information obtained from data on place of birth is that we get the last migrations but not all migrations.

The KDHS data are recorded retrospectively and can therefore suffer from misreporting, for example a child who died at a very young age might not be reported. Several DHS studies show evidence of downward bias in reporting child deaths (Jacoby and Wang, 2003), that is, the longer the recall period, the more likely the possibility of the respondents to misreport the case.

The quality of mortality estimates calculated from retrospective birth histories depends upon the completeness with which births and deaths are reported and recorded. Potentially the most serious data quality problem is the selective omission of the birth histories of those who did not survive, which can lead to underestimation of mortality rates.

Other potential problems include displacement of birth dates, which may cause a distortion of mortality trends, and misreporting of the age at death, which may distort the age pattern of mortality. When selective omission of childhood death occurs, it is usually most severe for deaths in early infancy. If early neonatal deaths are selectively underreported, the result is an unusually low ratio of deaths occurring within seven days to all neonatal deaths, and an unusually low ratio of neonatal to infant deaths. Underreporting of early infant deaths is most commonly observed for births that occurred long before the survey. An examination of the ratios shows no significant number of deaths omitted in the 2008-09 KDHS.

CHAPTER TWO:

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature on the effects of mothers' migration on child survival and the related environmental and socio-economic factors associated with survival status of children of migrants and non-migrant mothers in Kenya. The first part of this chapter focuses on the theoretical background of the study, followed by related empirical findings by previous studies. This chapter also delves into the conceptual and operational frameworks that guide the study and the hypotheses tested herein.

2.2 Theoretical background

In the sub-Saharan Africa, the theories attempting to explain infant and child survival can be divided into three broad categories that include; disruption, selection and environmental (adaptation) theories.

How does the disruption theory in migration apply to child survival? It can be hypothesized that on the one hand, migration is detrimental due to the break in mothers' networks and support groups. Migrant mothers stand to lose contact with people who would otherwise give support and advice on childcare and treatment in the event of the children's illness (Tam, 1994). Migration may also disrupt networks that a mother could use to obtain financial support in case she needed it, such as a loan to pay for medical treatment (Ssengonzi et al., 2002; Goldstein & Goldstein, 1981).

On the other hand, in the absence of economic crises, migration of mothers from rural to urban areas can enhance child survival by introducing the migrant to new job opportunities, community, and better health services (Onyango et al., 2011). Since migration is more likely to reduce fertility through disruption of sexual union between partners, this may increase the birth interval between children born to the migrant, hence increasing the survival chances of children. Research has shown that urban women report shorter birth intervals than rural women (Kimani,

2012), probably due to longer duration of breastfeeding among rural mothers compared to urban mothers (Ssengonzi et al., 2002). Shorter birth intervals are associated with reduced child survival. Thus, disruption as a result of migration has a positive effect on individuals' income-generation ability and hence on their access to adequate diet, shelter, and health care services that can promote healthy life.

Because migration represents a major disruption and requires a significant period of adaptation, life style and health related behavior of individuals may be affected by the migration process itself. Some of the factors associated with disruption include, education and occupation (Tam, 1994). Indeed, a disruption during the time of economic crises tends to exacerbate the beneficial effects of health because of the migrant's exposure to harsh economic realities (Ssengonzi et al., 2002).

Migration selection theory on the other hand argues that occupation, education, and wealth explain a person's propensity to migrate (Caldwell, 1986). Rural to urban migration is related to the concept of selectivity, which in turn is beneficial to child survival. Underlying this principle of infant and child survival is the recognition that rural-to-urban migration consists of people who are, more often than not, well educated, possess better occupational skills, have considerable wealth, and are mostly young compared to non-migrants (Ssengonzi et al., 2002). As a result, rural-urban migrants have greater ability to adapt to their new environment. In the case of infant and child survival, selectivity theory suggests that as migrants adapt to their environment, health status of infants and children depend largely on access to health care services and technology (Brockerhoff, 1990).

Because selectivity theory stresses the characteristics of the migrants, it then implies that in those societies where there are economic opportunities, the beneficial effects of selection will be enhanced. A critical idea related to selectivity is the notion of homogeneity of rural populations, and this needs to be taken into account for any investigation of the phenomena (Brockerhoff, 1990). Rural population in Kenya is essentially homogeneous in terms of life style, educational level, occupation (predominantly agriculture), high fertility and little access to technology. Given

these characteristics, it is expected that selectivity may be less important than urban adaptation in the relationship between migration and infant mortality (Ssengonzi et al., 2002).

The third explanation focuses on migrant adaptation or the environmental approach. The term migrant adaptation implies contact with urban environment through social interaction and increased exposure to new ideas may lead to changes in attitudes, life style, and motivations (Caldwell, 1969; Amankwaa et al., 2002). According to this view, migrants in an urban setting may be poised to adapt to urban living conditions by changing their behavior. Such changes are deemed necessary for the enhancement of the survival of children (Brockerhoff, 1990).

In fact, previous studies suggest that maternal child-care behavior, the quality of household facilities and fertility (such as birth interval and birth order) is among the most important types of adaptation that are associated with infant mortality. For example, there is evidence to suggest that care of women during pregnancy has a positive effect on neonatal mortality (Ssengonzi et al., 2002). Yet, in developing countries where most births take place at home with little understanding of disease transmission among infants (Kimani, 2012), exposure to risk is high. Toilet facilities and type of drinking water are used as control variables to account for risk of mortality. Because unsanitary toilet facilities and drinking water are expected to be negatively associated with survival, good drinking water and sanitary toilet facilities are assumed to increase the likelihood of infant and child survival (Kimani, 2012). One manifestation of migration would be to enhance survival, particularly if the movement is from rural to urban.

Environmental theory stresses not only adaptation to urban living conditions by changes in maternal behavior but also in terms of longer birth intervals and birth order. These necessities may stem from the physical or social environment (Amankwaa et al., 2002). Some sort of maternal behavior, for example, is necessary and because of the differences in social environment to which migrants must adapt.

2.3 Previous Research

Demographic factors are important determinants of infant and child survival in developing countries in traditional societies. Demographic factors have more impact than the socioeconomic factors (Tam, 1994). However, it is concluded that demographic factors are important during infancy and childhood, but social factors such as mother's education and occupation appear to be important predictors of infant mortality risks (Tam, 1994; Amankwaa et al., 2002).

Historically, migration has been an important component of African people's lives and Kenyans are no exception (Oucho, 2007). Before the surge in population during pre-colonial times, the relative abundance of arable land facilitated regular rural-rural migrations (Ssengonzi et al., 2002). Later on, a circular pattern of migration emerged where male workers would migrate considerable distances to obtain salaried employment in places such as mines and large plantations. They would often leave their families behind, and make regular visits to their villages of origin (Scott et al., 2013).

Although this type of migration still is quite common in some parts of the country, permanent migration has become more typical (Caldwell, 1969). More rural-rural migration also continued in search of larger land as the population grew. Overtime, more females started migrating but gender differences still exist in the incidence of migration (especially over long distances), in that more males migrate than females (Agesa & Agesa, 1999).

In addition, most migrants still maintain close ties with their home area, partly through visits but mainly through remittances (Caldwell, 1969). The increased migration of men and women has a direct impact on their offspring but despite the potentially significant intersection of these two factors, few researchers have examined the relationship between migration and infant/child mortality. Brockerhoff (1990) found that rural-urban migration by Senegalese women increased the survival probabilities of their children between 16 and 59 months of age. He attributes this finding mainly to urban-rural differentials in the availability of health services such that women who move from rural areas gain access to better health services for their children than they would have had in rural settings (Brockerhoff, 1990).

Brockerhoff (1990) also reports that the disparity in infant and child mortality persists between children of urban natives and those born to urban migrants, irrespective of the migrants' duration of residence in the urban area in Senegal and other Sub-Saharan countries (Brockerhoff, 1990).

Likewise, Tam (1994) found that the mortality risk of children born to rural migrant mothers in Peru and Bolivia was below that of children born to rural non-migrants, but higher than that of children born to urban natives. These finding confirms the hierarchical structure of infant mortality risk by residence in many developing countries as first noted by Brockerhoff, 1990. Large differentials in child mortality by region (rural versus urban) were also recorded in a number of developing countries where the World Fertility Surveys were conducted (Ssengonzi et al., 2002), perhaps due to differences in childcare, socioeconomic status, and health seeking behavior. However, very little work (to my knowledge) has considered the relationship between migration status of the mother and child survival up to age five, as well as estimating the probabilities of under-five mortality for migrants and non-migrants in Kenya. This study seeks to contribute to this research gap.

One source of hypotheses about relationships between migration and vital events is the fertility literature, which shows that differences between migrants and non-migrants are explained by the selection, disruption, and acculturation/adaptation theoretical framework. Generally, a strong negative relationship between rural-urban migration and fertility has been observed, where rural-urban migrant women are more likely to report lower fertility levels than their rural counterparts, although not as low as those of urban natives (Kimani, 2012). Although little work has been done in regard to how other streams (rural-rural, urban-rural, urban-urban) of migration influence mortality, it can be expected that the mortality out-comes of children in these migrations would be different from those of non-migrants.

2.4 Socio-economic factors on under-five mortality

The roles of socioeconomic status, cultural orientation, health habits, and health care utilization in accounting for differences in infants' survival chances by maternal migration status are assessed.

2.4.1 Socio-economic status of the mother (Wealth Index)

Socioeconomic status is positively related to favourable birth outcomes among the socioeconomic paradigm remains central to efforts to understand and improve maternal and infant health (Mutunga, 2007). Consequently, I discuss potential links between socioeconomic status and infant mortality befire considering arguments regarding conditions under which the influence of socioeconomic position may be attenuated.

Numerous studies demonstrate that maternal education is associated negatively with the risk of infant death (Ssengonzi et al., 2002); Onyango et al., 2011). The role of income has been studied less extensively because most available data sources (e.g., vital records-based files) lack information on individual or family income. However, a few investigations show the expected negative relationship between income and infant mortality (Mutunga, 2007). A fundamental issue is how these relationships occur. Clearly, socioeconomic position affects exposure to and vulnerability to risk factors for poor infant health. While some of these risk factors maybe social, others must be directly linked to biological processes that compromise survival chances. In the words of Kimani (2012), "Poverty must alter health through biological mechanism, and much of the work of epidemiology consists of decoding the "biological expression of so.

Economic position must be linked to infant health through a set of proximate determinants (Mosley and Chen, 1984). These proximate determinants include; maternal health, maternal lifestyle, maternal knowledge, and access to medical care. Specifically, low socioeconomic status is associated with health problems, such as chronic hypertension, diabetes, and sexually transmitted diseases that may compromise infant health. In addition, disadvantaged women often experience difficult life circumstances that may influence their lifestyles during pregnancy (Kimani, 2012).

For example, high levels of stress contribute to poor health behaviors that directly affect the growth and development of the fetus. Examples of such behaviors include inadequate nutrition, smoking and drinking (Mutunga, 2007).

2.4.2 Maternal Education

Limited knowledge may further exacerbate the elevated risks of poor birth outcomes among disadvantaged women. Clearly, education increases knowledge about general health practises (e.g., hygiene, nutrition) and healthy behaviour during pregnancy. Education also increases women's ability to access information and is associated with autonomy in making decisions regarding appropriate actions (Kimani, 2012).

A number of studies demonstrate that low-income women face significant barriers to prenatal care (Scott et al., 2013; Ssengonzi et al., 2002; Amankwaa et al., 2002). Programs like Medicaid provide access to medical care for those without adequate resources, but Medicaid recipients typically enter prenatal care later and receive fewer prenatal visits than do women with private health insurance (Kimani, 2012). Still, women with more education are likely to be better able to navigate the system and overcome obstacles to prenatal care.

The socioeconomic argument implies that maternal education and family income are negatively related to infant mortality. Moreover, differences in socioeconomic status may play a key role in explaining variation in infant mortality by maternal migration status. Nonetheless, a woman's socioeconomic position does not necessarily determine her children's destiny (Mutunga, 2007).

2.5 Environmental factors

Environmental health risks can fall into two broad categories. The first are the traditional hazards related to poverty and lack of development, such as lack of safe water, inadequate sanitation and waste disposal, indoor air pollution, and vector-borne diseases. The second category is the modern hazards such as rural air pollution and exposure to agro-industrial chemicals and wastes that are caused by development that lacks environmental safeguards (Shyamsundar, 2002).

According to Mutunga (2007), environmental characteristics such as safe source of drinking water supply have a significantly negative effect on child mortality. The same holds true for those with sanitation, which in most cases is taken to be access to a flush toilet or a ventilated improved pit latrine. Differentials by urban/rural residence have commonly been observed, with urban areas having more advantages due to ease of access to safe drinking water, sanitation facilities and low polluting fuels as their main source of cooking and therefore better child survival prospects (Mutunga, 2007)

2.6 Description of Conceptual Framework

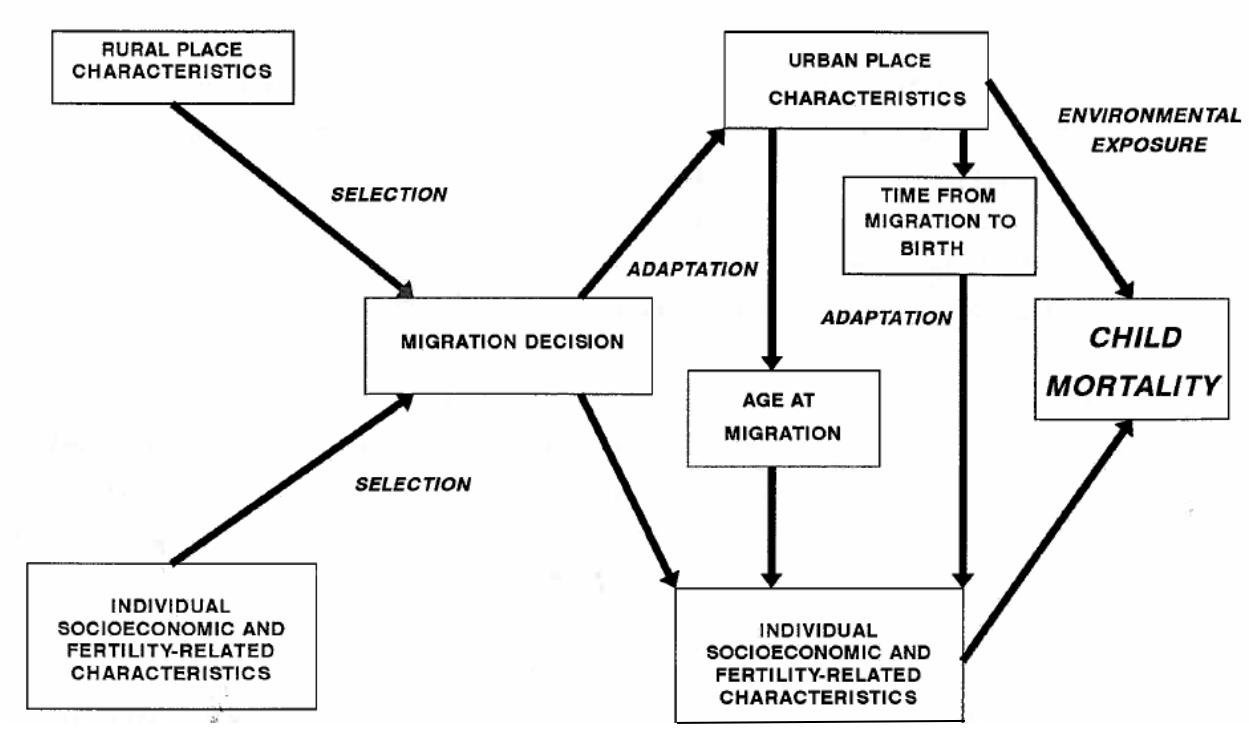
The conceptual framework used in this study is represented in Figure 1 below and it applies the Brockerhoff model to present the mortality relationships with various socio-economic, environmetal, and demographic factors, as to how they affect child survival in low and middle income countries such as Kenya (Brockerhoff, 1990). Given that rural to urban migrants are often more educated, the proportion of more of more occupationally skilled and wealthier young adults is greater in the urban population than in the rural population. This migrant selection per se may partly account for child mortality differentials between urban migants and non-migrants. Without considering the effects of living in urban environment (Tam, 1994).

Another variable to be included in the model for mortality analysis is migrant adaptation (Brockerhoff, 1990), i.e the contact with the urban environment will eventually lead to a change in the attidues, motivations and lifestyle of migrants ("acculturation") and their partial or complete occupational and residential intergration into the host society ("structural assimilation"). The adaptations of greatest impantance of child survival are those associated with maternal-child care behaviour, quality of household faccilities, and fertility (Tam, 1994).

Asper the model, even in the absence of positive migrant selection and adaptation, migration can also promote child survival if invloves relocating to a more favourable epidemiological environment or if certain health-related benefits of the urban place, such as climate and topography, extend to all residents. They will be calssified as environmetal exposure factors.

Figure 1 illustrates these pathways to child mortality among women migrants in Kenya.

Figure 1: Conceptual framework for the under-five mortality relationships



Adapted from Brockerhoff (1990)

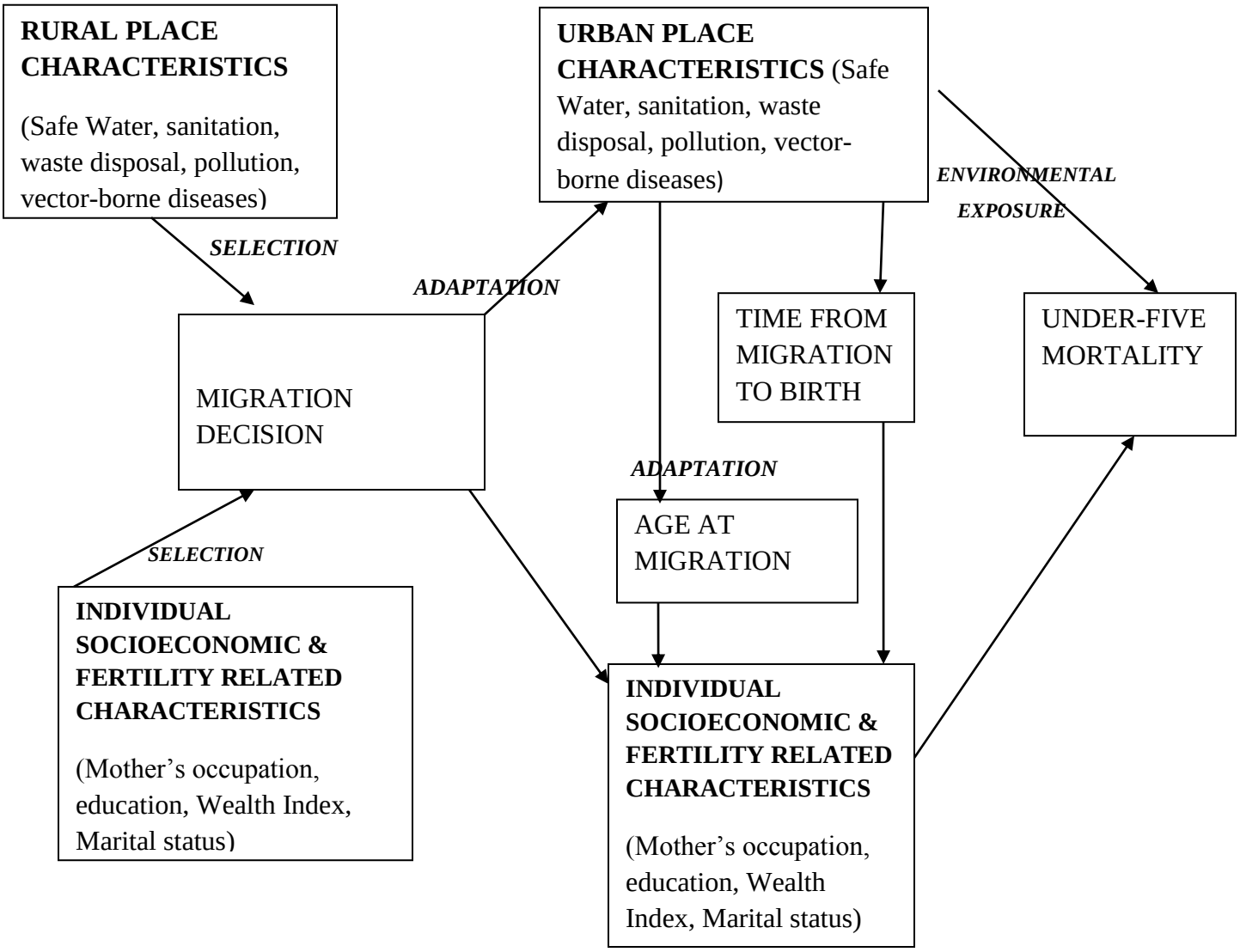


Figure 2: Operational framework for the under-five mortality relationships

Adapted from Brockerhoff (1990)

2.7 Hypothesis

Ho

The survival status of children under the age of five years in Kenya is not associated with their mother's migration status.

H_1

The survival status of children under the age of five years in Kenya is associated with their mother's migration status.

CHAPTER THREE

DATA AND METHODOLOGY

3.1 Introduction

This chapter presents a description of the data sources, the variables and the methods of data analysis used in this study.

3.2 Sources of data

This study used secondary data from the 2008-09 Kenya Demographic and Health Survey that contains data on demographic and health characteristics of men, women, children and the general household. The survey provides detailed information on maternal and child health, mortality, birth histories and characteristics of eligible women within the age range of 15-49. This study is limited to children born during the 59 months before the interview and will use the Child File dataset. A total sample of 6079 children under the age of five years was used in the study.

3.3 Operationalization of the Variables

In this study, the dependent variable is the child survival status, whether the child is alive or not (for ages 0–59 months). The independent variables are; migration stream, migration status of the mother, mothers current age, mother's education, mother's occupation, economic status of the mother, birth order, water source, type of toilet facility and the mother's marital status.

3.3.1 Dependent variable

The dependent variable in this study is the survival status of the child and it measures whether the child is dead or alive by age 5. It is categorized into; Dead= 0; Alive =1.

3.3.2 Independent Variables

Mother's Migration Status

Migration status of the mother is measured using the information on the previous place of residence, usual place of residence and duration of stay of the mother. This is the migration of mother after the birth of child (Caldwell, 1986). This study focuses on recent migrants who have only lived in their current place of residence for less than five years, and the non-migrants who have lived in current place for more than five years. The variable is categorized as; Migrant=0; Non-migrant=1.

Migration Stream

Migration streams refer to the migration typology that include, urban-rural, rural-urban, urban-urban and rural-rural. The data on the streams is obtained from the information on the previous place of residence and usual place of residence. They are coded as; Rural-urban=0; urban-rural=1; rural-rural=2; urban-urban=3.

Mothers' Education

The variable measures the level of education that the respondent has attained. It is categorized into three groups as follows; no education=0, primary=1, secondary +=2.

Mothers' Occupation

The variable measurers' respondent's type of work. The responses were categorized as professional, no work, and agricultural/manual/others. The coding was done as; No Work=0; Agric/Manual/Others= 1; Professional = 2.

Mother's marital status

This variable measures the respondents' marital status. The variable is coded as; Never married=0; Married= 1; Widowed=2, Divorced/Separated =3.

Mother's current age

The variable measures the current age of the mother and it is coded as; <24=0; 24-34 =1; 35+ =2

Wealth Index

This variable measures the socio-economic status of the family. It is categorized as: Poorest=0; Poorer=1; Middle =2; Richer= 3; Richest=4.

Type of toilet facility

This variable measures the type of toilet facility for the family. It is coded as; Pit Latrines=0; Flush=1; None/Others= 2.

Source of water

The variable measures the water source for family use. It is coded as, Well=0; Surface/Others=1; Piped=2.

Table 1.List of variables used in the analysis

Variable Name	**Measurement**
Dependent Variable	
Survival Status of the child (for ages 0–59 months)	Dead=0 Alive=1
Independent Variables	
Migration status	Migrant=0 Non migrant= 1
Migration stream	Rural-urban=0 Urban-Rural=1 Rural-Rural=2 Urban-Urban=3
Marital status of the mother	Never married =0 Married =1 Widowed =2 Divorced/Separated =3
Mother's education	No education = 0 Primary education = 1 Secondary education + = 2
Mother's occupation	No Work=0 Professional = 1 Agric/Manual/Others= 2
Mother's current age	<24 = 0 24-34 = 1 35+ = 2
Wealth index	Poorest = 0 Poorer = 1 Middle = 2 Richer= 3 Richest= 4

Birth order	First birth = 0 2-3 = 1 4-6 = 2 7+ = 3
Type of toilet facility	Flush = 0 Pit latrine = 1 None/Others = 2
Source of water	Pipe= 0 Well = 1 Surface/others = 2

3.4 Method of data analysis

The study used descriptive (Univariate and and Bivariate analysis) and multivariate analysis (Cox proportional hazard model). The Descriptive analysis was used to describe the background characteristics of the study sample while the Bivariate analysis was used to determine the association between the dependent and independent variables, and the possible effects of the factors on the under-five survival status. Life tables were used to estimate the probability of child death before age five for migrants and non-migrants.

The multivariate Cox proportional hazards regression was used to show the predictors of child survival and migration status. The equation states;

$$h(tX) = h_o(t)\, exp(\beta_i X_i)$$

$$\log \frac{h(t\mathbf{X})}{h_0(t)} = \exp(\boldsymbol{\beta}_i \mathbf{X}_i)$$

where, $h_o(t)$ is the baseline hazard function when $\mathbf{X=0}$; $\mathbf{X}$ is a vector of covariates

$\boldsymbol{\beta}_i$ is a vector of unknown parameters to be estimated in the model

CHAPTER FOUR

BACKGROUND CHARACTERISTICS OF RESPONDENTS

4.1 Introduction

This chapter presents the background characteristics of the study population and the results of cross tabulation and the Chi Square Tests. Cross-tabulation and Chi Square tests show the level of association between survival status of the children and the selected background variables.

4.2 Characteristics of the study population

Table 2 below presents the background characteristics of the study population. Out of the 6079 children analyzed, 6.1 percent had died before attaining their fifth birthday while 93.9 percent survived within the same period. 34 percent of the children were born to women who migrated, while 65.6 percent of the children were born to women non-migrants. 85 percent of the mothers of the children were married while about 6 percent were never married and approximately 3 percent and 6 percent were widowed and divorced/separated respectively. Approximately 56 percent of the mothers had primary level of education, 21 percent no education, and 23 percent had attained secondary education and higher.

Children of mothers in professional employment constituted 25 percent, 43 percent of the mothers were unemployed and 32 percent were in agriculture or other menial jobs. With regard to the economic status of the mother of the children, 47 percent were poor, 37 percent rich, and 16 percent falling in the middle. Out of the 6079 births, a high proportion, (38%) of children were of birth order 2-3; 23 percent of the births were first births with birth orders of 4 and above at almost 40 percent. On the type of toilet facility, the majority (63.3%) of children were born of women who used pit latrines, 10 percent from households using flush toilets, while those with no toilet facility formed about 27 percent. Majority (45.8%) of the children were from households that used water from the surface and other sources while 27.8 percent used piped water and 26.4 percent having used water from wells.

Table 2: The distribution of the study population and their characteristics

Characteristics	Number /Frequency	Percent
Survival Status of the child (0–59 months)		
Dead	373	6.1
Alive	5706	93.9
Migration Status		
Migrants	2093	34.4
Non Migrants	3986	65.6
Migration Stream		
Rural-urban	387	18.6
Urban-rural	316	15.2
Rural-rural	1005	48.4
Urban-urban	370	17.8
Marital status of the mother		
Never Married	383	6.3
Married	5181	85.2
Widowed	166	2.7
Divorced/Separated	349	5.7
Mother's education		
No education	1300	21.4
Primary	3430	56.4
Secondary +	1349	22.2
Mother's occupation		
No work	2588	42.6
Professional	1523	25.1
Agric/Manual/Others	1968	32.4
Mother's current age		
<24 years	1639	27
24-34	3280	54

35+	1160	19
Wealth index		
Poorest	1777	29.2
Poorer	1079	17.7
Middle class	985	16.2
Richer	985	16.2
Richest	1253	20.6
Birth Order		
First birth	1387	22.8
2-3	2284	37.6
4-6	1705	28.0
7+	703	11.6
Type of toilet facility		
Pit latrine	3847	63.3
None/Others	1629	26.8
Flush	603	9.9
Source of water		
Pipe	1688	27.8
Well	1607	26.4
Surface/others	2784	45.8

Source: KDHS, 2008/09

4.3 Bivariate analysis

4.3.1 Introduction

In this section, cross tabulation and the Chi Square Tests were used to show the level of association between the survival status of the children and the selected background variables. Life tables were applied in the estimation of probabilities of under-five mortality for migrants and non-migrants. The results in this section respond to objective (ii) that sought to estimate the probabilities of under-five mortality for migrants and non-migrants.

From the results displayed in table 3, it can be observed from the bivariate results that migration status, marital status of the mother, mother's current age and birth order number are associated with child survival up to age of five years in Kenya. According to the results, mother's migration status was significantly associated with child survival with a P-value of 5% thus confirming the hypothesis that states that survival chances of children up to the age of five is affected by mother's migration status.

The findings show differentials in proportions of under-five mortality for migrants and non-migrants. From the proportions shown in Table 3, under-five mortality for migrants is higher (7.1%) than that of non-migrants (5.6%). The differentials show that children of non-migrant migrant mothers are more likely to survive up to age of five as compared to those of migrant mothers.

Furthermore, from the results of the life table (See Appendix A), reveals that the probability of death of children of migrant mothers is higher at 0.09 than that of children born of non-migrant mothers 0.07. Therefore, this supports the hypothesis that the survival status of children under the age of five years in Kenya is associated with their mother's migration status.

Table 3: Association between migration status, migration stream and child survival.

Variables	Survival status		Chi Square Tests	
	Dead	**Alive**	**Value**	**P-Value**
Migration Status			4.848	0.028*
Migrants	148 **(7.1%)**	1945 **(92.9%)**		
Non Migrants	225 **(5.6%)**	3761 **(94.4%)**		
Migration Stream			4.250	0.236
Rural-urban	23 **(5.9%)**	364 **(94.1%)**		
Urban-rural	26 **(8.2%)**	290 **(91.8%)**		
Rural-rural	78 **(7.8%)**	927 **(92.2%)**		
Urban-urban	19 **(5.1%)**	351 **(94.9%)**		

*P< 0.05, **P<0.01, ***P<0.001

With regard to other variables and their association with survival status of migrant and non-migrant children , the results of bivariate analysis displayed in Table 4 reveals that marital status of the mother of the children was significantly associated with child survival for both migrants and non-migrants with a P-value of 1%. Birth order number also had an association with child survival for both migrants and non-migrants in Kenya with a P-value of 5%. This shows that birth order is significantly associated with child survival, therefore confirming findings from other studies that revealed the same kind of relationship (Onyango et al., 2011). The study further reveals that mother's occupation was strongly associated with survival status of only non-migrant children at a P-value of 1%. Wealth index had a strong influence on child survival for only migrants with a P-value of 1%. Mother's current age depicted a significant association with child survival for non-migrants only with a P-value of 5%. Type of toilet facility was found to be associated with child survival for only the migrant children at a P-value of 5%.

Table 4: Association between migration status, child survival and the background variables

	Migrants		**Non-migrants**	
	Survival Status		**Survival Status**	
Characteristics	**Dead**	**Alive**	**Dead**	**Alive**
Marital status of the mother				
Never Married	5 (4.0%)	119 (96.0%)	8 (5.0%)	251 (95.0%)
Married	117(6.5%)	1677 (93.5%)	192 (5.7%)	3195 (94.3%)
Widowed	12(24.5%)	37 (75.5%)	10 (8.5%)	107 (91.5%)
Divorced/Separated	14(11.1%)	112 (88.9%)	15 (6.7%)	208 (93.3%)
Total	148	1945	225	3761
Chi-Sq	**P-Value : 0.028*** **Value: 4.848**			
Mother's education				
No education	15 (5.7%)	246 (94.3%)	65 (6.3%	974 (93.7%)
Primary	98(7.9%)	1145 (92.1%)	124 (5.7%)	2063(94.3%)
Secondary +	35 (5.9%)	554 (94.1%)	36 (5.7%)	724 (95.3%)
Total	148	1945	225	3761
Chi-Sq	**P-Value : 0.292** **Value: 2.459**			
Mother's occupation				
No work	63 (7.4%)	785 (92.6%)	76 (4.4%)	1664 (95.4%)
Professional	32 (5.9%)	514 (94.1%)	67 (6.9%)	910 (93.1%)
Agric/Manual/Others	53 (7.6%)	646 (92.4%)	82 (6.5%)	1187 (93.5%)
Total	148	1945	225	3761
Chi-Sq	**P-Value : 0.092** **Value: 4.771**			
Mother's current age				
Under 24 years				
24-34	40 (7.4%)	502 (92.6%)	72 (6.6%)	1025 (93.4%)
35+	77 (6.7%)	1071 (93.3%)	96 (4.5%)	2036 (95.5%)
	31 (7.7%)	372 (92.3%)	57 (7.5%)	700 (92.5%)
Total	148	1945	225	3761
Chi-Sq	**P-Value : 0.026*** **Value: 7.283**			

Wealth index				
Poorest	27 (6.5%)	386 (93.5%)	82 (6.0%)	1282 (94.0%)
Poorer	32 (4.7%)	241 (88.3%)	40 (5.0%)	766 (95.0%)
Middle class	24 (8.6%)	255 (91.4%)	49 (7.0%)	657 (93.0%)
Richer	28 (6.6%)	396 (93.4%)	19 (3.4%)	542 (96.6%)
Richest	37 (5.3%)	667 (94.7%)	35 (6.4%)	514 (93.6%)
Total	148	1945	225	3761
Chi-Sq	**P-Value : 0.145 Value: 6.835**			
Birth Order				
First birth	49 (6.3%)	725 (93/7%)	24 (3.9%)	589 (96.1%)
2-3	60 (6.5%)	867 (93.5%)	72 (5.3%)	1285 (94.7%)
4-6	30 (9.3%)	291 (90.7%)	81 (5.9%)	1303 (94.1%)
7+	9 (12.7%)	62 (87.3%)	48 (7.6%)	584 (92.4%)
Total	148	1945	225	3761
Chi-Sq	**P-Value :0.050* Value: 7.501**			
Type of toilet facility				
Pit latrine	12 (4.0%)	289 (96.0%)	17 (5.3%)	302 (94.7%)
None/Others	98 (7.0%)	1294 (93.0%)	132 (5.1%)	2455 (94.9%)
Flush	35 (9.3%)	343 (90.7%)	74 (6.0%)	1162 (94.0%)
Total	148	1945	225	3761
Chi-Sq	**P-Value : 0.128 Value: 4.111**			
Source of water				
Pipe	44 (6.0%)	700 (94.0%)	66 (7.0%)	878 (93.0%)
Well	31 (6.2%)	466 (93.8%)	61 (5.5%)	1049 (94.5%)
Surface/others	70 (8.4%)	760 (91.6%)	96 (5.1%)	1769 (94.9%)
Total	148	1945	225	3761
Chi-Sq	**P-Value : 0.639 Value: 0.896**			

*P< 0.05, **P<0.01, ***P<0.001

4.4 Multivariate Analysis

4.4.1 Fitting of the models

Having examined the association between child survival and each independent variable and found that some variables were significantly associated with child survival at bivariate level while some variables not significant, the next step was to fit the hazard proportional models for the variables so as to establish the net effects of the other explanatory variables on the survival and migration status.

Five models were fitted, with the first model only having the gross effect of migration status. The second had the socio-economic variables such as the wealth index, mother's occupation and mother's education. The third model was fitted with the environmental variables that included water source and type of toilet facility. The fourth model had the bio-demographic variables that included; current age of the mother, mother's marital status and birth order number. The fifth model was fitted with all the variables that included the socio-economic, environmental and bio-demographic variables. The explanatory variables include; marital status of the mother, mother's current age, migration status, water source and birth order number. The association was measured differently for migrants and non-migrants to help determine the factors that cause the under-five mortality differentials among migrants and non-migrants.

Table 5 shows the results of the first model, where migration status was found to have a statistically significant effect in influencing survival status of children under the age of five years. The results reveal that children born of non-migrant mothers were 0.8 times less likely to die within the first 59 months after birth compared to those born of migrant mothers. The relationship was significant at 5%. This confirms that children born of non-migrant mothers are more likely to survive up to age five than those born of migrant mothers.

Table 5: A multivariate hazard model of child survival by migration status

Variables in the model	Coefficient (ß)	Standard Error (SE)	Exp (ß)
Migration Status			
Migrants			
Non Migrants	-0.246	0.106	0.782*

Source, KDHS, 2008-09

**P<0.05, **P<0.01, ***P<0.001*

In the second model, Wealth index was found to have a statistically significant association to child survival for the migrants at significance level of 5%. For instance, for the migrants, children born to poorer households were found to be 1.7 times more likely to die before age five as compared to those from poorest households, at a significance level of 5%.

For the non-migrants, mother's education was found to be significant to child survival at significance level of 1%. The results of this model show that children born of non-migrant mothers who worked as professionals were 1.7 times more likely to die before age five as compared to the children born to non-migrant mothers who never worked. Furthermore, for the non-migrants, the children born of mothers who worked in the agricultural sector or in semi-skilled or manual jobs were 1.6 times more likely to die before age five compared to those children born of mothers who never worked.

Table 6a: A multivariate hazard model of child survival for migrants and non-migrants by mother's education, mother's marital status and wealth index.

Migration Status	Variables in the model	Coefficient (ß)	Standard Error (SE)	Exp (ß)
Migrants	**Wealth index**			
	Poorest			
	Poorer	0.552	0.268	1.737*
	Middle class	0.199	0.289	1.220
	Richer	-0.056	0.281	0.945
	Richest	-0.263	0.274	0.769
	Mother's occupation			
	No work			
	Professional	-0.255	0.222	0.775
	Agric/Manual/Others	-0.133	0.189	0.875
	Mother's education			
	No education			
	Primary	0.360	0.291	1.433
	Secondary +	0.258	0.334	1.295
Non-migrants	**Wealth index**			
	Poorest			
	Poorer	-0.164	0.206	0.849
	Middle class	0.196	0.196	1.217
	Richer	0.484	0.270	0.616
	Richest	0.213	0.238	1.237
	Mother's occupation			
	No work			
	Professional	0.505	0.173	1.656*
	Agric/Manual/Others	0.452	0.167	1.571*
	Mother's education			
	No education			
	Primary	-0.215	0.177	0.807
	Secondary +	0.468	0.250	0.626

Source, KDHS, 2008-09

**P<0.05, **P<0.01, ***P<0.001*

The overall model two predicts an association of significance at 5% between wealth index and mother's education and occupation to survival status of children under the age of five years. The model is significant to both migrants and non-migrants.

Table 6b: Omnibus Test of Model Coefficients[a]

Migration status	-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
		Chi-square	Df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
Migrants	2203.071	16.905	8	.031	15.641	8	.048	15.641	8	.048
Non-migrants	3652.494	21.510	8	.006	22.519	8	.004	22.519	8	.004

Model three was fitted with water source and type of toilet facility for both migrants and non-migrants. The results shown in Table 7a reveals that source of water was only associated with child survival for non-migrants at a significance level of 5%. For the non-migrants, children born from households that used water from the surface or other sources such as dams, lakes, springs were 0.6 times less likely to die before age five as compared to those born in households that use piped water.

Type of toilet facility was found to be associated with child survival for migrants only, at a statistical significance of 5%. The results show that children born from households that used flushed toilets were 3 times less likely to die before age five as compared to those from households that use pit latrines.

Table 7a: A multivariate hazard model of child survival for migrants and non-migrants by source of water and type of toilet facility

Migration Status	Variables in the model	Coefficient (ß)	Standard Error (SE)	Exp (ß)
Migrants	**Source of Water**			
	Piped			
	Well	-0.200	0.258	0.819
	Surface/others	0.575	0.239	1.077
	Type of toilet facility			
	Pit Latrine			
	None/Others	0.496	0.354	1.643
	Flush	-1.006	0.428	2.735*
Non-migrants	**Source of Water**			
	Piped			
	Well	-0.364	0.200	0.695
	Surface/others	-0.488	0.192	0.614*
	Type of toilet facility			
	Pit Latrine			
	None/Others	0.223	0.330	1.250
	Flush	0.346	0.375	1.414

Source, KDHS, 2008-09

**P<0.05, **P<0.01, ***P<0.001*

Model three in overall reveals significance between the environmental factors (type of toilet facility and water source) and child survival for both migrants and non-migrants. The level of significance is at 5% for migrants and 1% for the non-migrants.

Table 7b: Omnibus Test of Model Coefficients[a]

Migration status	-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
		Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
Migrants	2149.448	24.538	12	.017	7.771	4	.100	7.771	4	.100
Non-migrants	3604.003	30.237	12	.003	6.957	4	.138	6.957	4	.138

Model four was fitted with three variables which are; mother's current age, marital status of the mother and birth order number. From the results shown in table 8a, current age of the mother was only significant for non-migrants. The variable generally was highly significant at 1%. However, children born of mothers aged 24 to 34 years were found to be 0.7 times less likely to die before age five as compared to those born of mothers aged less than 24 years old at 5% level of significance.

Birth order number on the other hand was also found to be significant for only the non-migrants. For the non-migrants, children of birth order number 7 and above were 2 times more likely to die before age five than those of the first birth, at a statistically significance level of 5%.

Marital status of the mother was found to be a highly significant factor only to the migrants at significance level of 1%. The children born of widowed migrant women were found to be 4 times more likely to die before age five as compared to those born to never married migrant women. The relationship was significant at 5% level. Mother's marital status was not significant to the non-migrants.

Table 8a: A multivariate hazard model of child survival for migrants and non-migrants by current age of the mother, marital status of the mother and birth order number

Migration Status	**Variables in the model**	**Coefficient (ß)**	**Standard Error (SE)**	**Exp (ß)**
Migrants	**Current age of the mother**			
	Under 24 years			
	24-34	-0.038	0.198	0.962
	35+	0.031	0.245	0.969

	Marital status of the mother			
	Never Married	0.315	0.465	1.370
	Married	1.399	0.558	4.051*
	Widowed	0.843	0.537	2.324
	Divorced/Separated			
	Birth Order			
	First birth			
	2-3	0.013	0.199	1.013
	4-6	0.365	0.248	1.440
	7+	0.487	0.390	1.627
Non-migrants	**Current age of the mother**			
	Under 24 years			
	24-34	-0.375	0.158	0.687*
	35+	0.206	0.179	1.229
	Marital status of the mother			
	Never Married			
	Married	0.333	0.381	1.395
	Widowed	0.618	0.498	1.855
	Divorced/Separated	0.517	0.450	1.677
	Birth Order			
	First birth			
	2-3	0.172	0.253	1.188
	4-6	0.296	0.257	1.344
	7+	0.546	0.279	1.726*

Source, KDHS, 2008-09

**P<0.05, **P<0.01, ***P<0.001*

The model summary shown in table 8b below depicts a high degree of significance with the P-values at 1% for both migrants and non-migrants. This shows that the predictor variables (current age of the mother, birth order and marital status) are well placed to make accurate predictions for child survival for both migrants and non-migrants. The model is therefore a good predictor of the survival status of the children and the results suggest that current age of the mother, birth order and marital status are significantly associated to child survival up to age of five years for both the migrants and the non-migrants in Kenya.

Table 8b: Omnibus Test of Model Coefficients[a]

Migration status	-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
		Chi-square	Df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
Migrants	2129.951	52.697	20	.000	19.496	8	.012	19.496	8	.012
Non-migrants	3583.133	51.246	20	.002	20.870	8	.008	20.870	8	.008

Multivariate analysis results of the final full model are represented in Table 9a. Eight variables were fitted in the model and they include, current age of the mother, wealth index, birth order, mothers occupation, water source and type of toilet facility. The variables have varying significant associations with survival status of children born of both migrants and non-migrant children. Variables that were found to be significant for migrants include; marital status of the mother, wealth index, type of toilet facility and mother's education.

For the migrants, children born of widowed mothers were 4 times more likely to die before age five as compared to children of never married women. The association was at a significance level of 5%. In regard to wealth index, children born from poorer households were 2 times more likely to die before attaining the age of five as compared to those born in poorest households. The association was at 5% level of significance. Type of toilet facility was found to have an association with survival status of children of migrants at a significance level of 5%. Children from households that used flush toilets were found to be 2 times less likely to die than those from households that used pit latrines. For education, children of mothers who had primary education were 2 times more likely to die before age five than those of mothers with no education. The association was at significance level of 5%.

On the other hand, child survival for non-migrants was affected by current age of the mother, wealth index, occupation of the mother and water source. For instance, children born of non-migrant mothers aged between 24 years to 34 years were found to be 0.7 times less likely to die before attaining age five as compared with the children born of mothers aged below 24 years. The association was at a significance level of 5%. Also, children from the richer households were found to be 0.6 times less likely to die before attaining age five, at a significance level of 5% than the children from the poorest households. Children born of non-migrant mothers who worked as professionals were found to be 0.7 times more likely to die before age five compared to those of mothers who never worked. This association was at a significance level of 5%. Furthermore, children born of non-migrant mothers who worked in agricultural fields and in other casual jobs were found to be 0.6 times more likely to die before age five as compared to those born of mothers who never worked. The association was at a significance level of 1%.

Further, the result reveals that children from households that use water from Wells were 0.7 times less likely to die at under the age of five years as compared to children from households that use piped water. The association was found to be at a significant level of 5%. Moreover, children from households that used surface water were 0.6 times less likely to die than those that used pied water. The association was at a significance level of 1%.

Table 9a: A multivariate hazard model of child survival for migrants and non-migrants by mother's marital status, current age of the mother, wealth index, birth order, mother's education, mother's occupation, type of toilet facility and source of water.

Migration Status	**Variables in the model**	**Coefficient (ß)**	**Standard Error (SE)**	**Exp (ß)**
Migrants	**Marital status of the mother**			
	Never Married			
	Married	0.315	0.465	1.370
	Widowed	1.399	0.558	4.051*
	Divorced/Separated	0.843	0.537	2.324
	Current age of the mother			
	Under 24 years			
	24-34	-0.038	0.198	0.962
	35+	-0.031	0.245	0.969
	Wealth index			
	Poorest			
	Poorer	0.707	0.288	2.028*
	Middle class	0.400	0.313	1.491
	Richer	0.122	0.326	1.130
	Richest	0.236	0.354	1.266

	Birth Order			
	First birth			
	2-3	0.013	0.199	1.013
	4-6	0.365	0.248	1.440
	7+	0.487	0.390	1.627
	Type of toilet facility			
	Pit Latrine			
	None/Others	0.489	0.354	1.631
	Flush	0.993	0.429	1.699*
	Source of water			
	Pipe			
	Well	-0.215	0.259	0.806
	Surface/others	0.063	0.239	1.065
	Mothers Occupation			
	No Work			
	Professional	-0.303	0.227	0.738
	Agric/Manual/Others	-0.139	0.194	0.971
	Mother's education			
	No education			
	Primary	0.630	0.315	1.878*
	Secondary +	0.710	0.364	2.033
Non-Migrants	**Marital status of the mother**			
	Never Married			
	Married	0.333	0.384	1.395
	Widowed	0.618	0.498	1.855
	Divorced/Separated	0.517	0.450	1.677
	Current age of the mother			
	Under 24 years			
	24-34	-0.375	0.158	0.687*

	35+	0.206	0.179	1.229
	Wealth index			
	Poorest			
	Poorer	-0.187	0.216	0.829
	Middle class	0.179	0.214	1.196
	Richer	-0.597	0.299	0.551*
	Richest	0.124	0.321	1.132
	Birth Order			
	First birth			
	2-3	0.172	0.253	1.204
	4-6	0.296	0.257	1.373
	7+	0.546	0.279	1.787
	Type of toilet facility			
	Pit Latrine			
	None/Others	0.183	0.331	1.201
	Flush	0.309	0.376	1.362
	Source of water			
	Pipe			
	Well	-0.407	0.199	0.666*
	Surface/others	-0.552	0.191	0.576**
	Mothers Occupation			
	No Work			
	Professional	0.400	0.200	0.670*
	Agric/Manual/Others	0.538	0.192	0.584**
	Mother's education			
	No education			
	Primary	-0.099	0.188	0.905
	Secondary +	-0.271	0.266	0.763

Source, KDHS, 2008-09
*P<0.05, **P<0.01, ***P<0.001

The model summary shown in Table 9b below depicts a high degree of significance with the P-values of 0.000 for migrants and non-migrants. This shows that the predictor variables are well placed to make accurate predictions. The -2Loglikelihoods of the equations are 2134.7 (df=18, $p<0.05$) for migrants and 3584.5 (df=18, $p<0.05$) for the non-migrants. The model is therefore a good predictor of the survival status of the children and the results suggest that migration is significantly related to child survival up to age of five years for both the migrants and the non-migrants.

Table 9b: Omnibus Test of Model Coefficients[a]

Migration status	-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
		Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
Migrants	2134.739	47.194	18	.000	37.334	18	.005	37.334	18	.005
Non-migrants	3584.503	50.195	18	.000	50.861	18	.001	50.861	18	.000

4.5 Discussion

The bivariate analysis results shows that the mother's migration status, marital status of the mother and birth order were significantly associated with child survival up to age five in Kenya. Multivariate results gave further evidence about the results of the bivariate analysis. Out of the seven variables fitted in the hazard model, five were found to have statistically net effects on survival status of children up to the age of five years for both migrants and non-migrants. For the migrants, type of toilet facility was found to be significant in the final model, while the other variables such as current age of the mother, birth order number, water source, marital status and wealth index were found to have significant effects on the non-migrants.

An important association of maternal migration with under-five mortality in Kenya has been found in this study. Children of non-migrant mothers had a mortality risk (5.6%) lower than children born of migrant mothers (7.1%). These findings confirm with other previous studies that migration status of the mother is likely to influence survival chances of children (Onyango et al., 2011: Ssengonzi et al., 2002, Tam, 1994).

Additionally, the results conforms with studies in informal settlements in Nairobi the largest city in Kenya that effect of mother's migration on childhood mortality is a persistent disadvantage of children born to migrant mothers irrespective of the length of stay in the receiving zone (Adama et al., 2004). A number of literatures indicate that many people who move to other areas, either to urban or rural areas do so with expectations of higher earnings and an improved life cycle but eventually end up in worse off states than their places of origin (Onyango et al., 2011; Davis, 1973; Brokerhoff, 1990). However, it may be the fact that majority of migrants end up settling in a similar or even worse off condition than that of their previous residence.

The observed elevated risk of death among children of mothers who migrate lends support to the findings that rapid in-migration to towns and cities of developing countries may lead not only to such well-known problems as shortages of housing, jobs and social services, and to environmental degradation (UNICEF, 2012), but also to increased threats to the health of children of migrants population (Tam, 1994).

Various factors may be responsible for the high proportions migrant child mortality than those of non-migrants. Immediate exposure to new environment may partly explain the relative difference particularly when act of migration may have disrupted the usual life cycle behaviors such as temporary residence in more crowded housing (moving to informal urban settlements); mother adjustment to new economic and social constraints which might further disrupt feeding patterns of newborn (Onyango et al., 2011).

The observed better survival chances of children born in richer families confirms the previous findings that better socio-economic status enhance survival chances of the children, by exposing them to better healthcare and nutrition (Ssengonzi et al., 2002). Tam (1994) underscored the importance of social circumstances in which the mother lives and concluded that in poorer settings, mothers were far greater disadvantaged with respect to survival chances of their children compared to those in richer settings.

CHAPTER FIVE: SUMMARY, CONCLUSSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the whole research project, outlines major study findings on the association between mothers migration and under-five survival in Kenya. This section delves into the conclusions made from the findings, as well as recommendations for policy and for future research.

5.5 Summary

This study set out to analyze the effects of mothers' migration and other factors on under-five mortality in Kenya. The whole study was carried out with the overall objective of examining the effect of mothers' migration on survival status of children under the age of five years. Specifically, it sought to estimate proportions of under-five mortality rates for migrants and non-migrants in Kenya, and to determine the factors associated with under-five mortality among migrants and non-migrants in Kenya.

To achieve the objectives, an hypothesis was tested by fitting a model to data drawn from the 2008/09 Kenya Demographic and Health Survey. Child Survival status was taken as the dependent variable. Ten explanatory variables were used in the study and they include; mother' marital status, migration status, migration stream, current age of the mother, wealth index, mother's education, mother's occupation, birth order, source of drinking water, and toilet facility.

For the migrants, marital status of the mother, wealth index, type of toilet, mother's education were found to have significant effects on child survival up to age of five years.

On the other hand, child survival for non-migrants was affected by current age of the mother, wealth index, occupation of the mother and water source.

5.6 Conclusions

Most of the results from the significant variables show the expected direction. The mortality risks of children under the age of five years for non-migrant mothers fall below that of migrant mothers. Additionally, bivariate and multivariate results are indicative of gross effects of the selected variables on the risk of death before 59 months of life.

Children whose mothers were married have higher survival chances compared to those with higher education. The same can be noted of other factors such as the effect of marital status, birth order, water source and wealth index, as they have been found to affect the survival status of children up to age five for both migrants and non-migrants.

5.7 Recommendations

5.7.1 Policy recommendations

From a policy perspective, these findings are useful for the design and implementation of maternal and child health programs for the migrant and non-migrant populations in Kenya. The results highlight the need to come up with concrete migration policies to help regulate migration in the country, especially for mothers with children under the age of five years. Such policies will help initiate programs that will guarantee the mother better healthcare facilities, jobs, more opportunities for business that will eventually discourage them from migrating.

Furthermore, there should be policies targeted at migrant groups especially mothers and the children with the provision of health care services and other social services. Furthermore, the disruptive effect may be severely undermining the survival status of many migrant children hence the need to develop educative programs to mitigate the negative factors associated with migration.

5.7.2 Recommendations for further research

There is need for further study on the various migration streams to determine the differentials in under-five mortality for both the migrants and non-migrants. This study only focused on the state of migration without going deeper to explore the explanatory factors for under-five mortality differentials for the various migration streams such as rural-rural, rural- urban, urban- urban and urban-rural.

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APPENDIX

Appendix A

Life table results for the estimation of the probability of death before age five for migrants and non-migrants in Kenya.

Life Table					
First-order Controls		Interval Start Time	Cumulative Proportion Surviving at End of Interval	Std. Error of Cumulative Proportion Surviving at End of Interval	Probability Density
Migration Status	Migrants	0	.95	.00	.008
		6	.94	.01	.002
		12	.93	.01	.002
		18	.92	.01	.001
		24	.92	.01	.001
		30	.92	.01	.000
		36	.91	.01	.000
		42	.91	.01	.000
		48	.91	.01	.000
		54	.91	.01	.000
	Non-migrants	0	.96	.00	.007
		6	.95	.00	.001
		12	.94	.00	.001
		18	.94	.00	.000
		24	.94	.00	.000
		30	.94	.00	.000
		36	.93	.00	.001
		42	.93	.00	.000
		48	.93	.00	.000
		54	.93	.00	.000

Source, KDHS, 2008-09