DEMOGRAPHIC AND SOCIOECONOMIC FACTORS ASSOCIATED WITH UNDER-5 MORTALITY IN KWAZULU-NATAL, SOUTH AFRICA

A RESEARCH REPORT SUBMITTED TO THE FACULTY OF HUMANITIES, SCHOOL OF SOCIAL SCIENCES, UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN THE FIELD OF DEMOGRAPHY AND POPULATION STUDIES

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DECLARATION

I, **Mbuzeleni N. Hlongwa** hereby declare that this research report is my own work. It is submitted for the degree of Master of Arts in Demography and Population Studies at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination in any other university.

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I would like to thank God who guided me throughout this journey.

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I would like to thank my family for the support, love, encouragement and belief in me. May God bless you!

DEDICATION

This research report is dedicated to the Almighty God and my family.

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ACRONYMS AND ABBREVIATIONS

AOR	Adjusted Odds Ratio
CI	Confidence Interval
DOH	Department of Health
DSD	Department of Social Development
IMR	Infant Mortality Rate
KZN	KwaZulu-Natal
MRC	Medical Research Council
NDP	National Development Plan
NHI	National Health Insurance
OR	Odds Ratio
SA	South Africa
Stats SA	Statistics South Africa
UOR	Unadjusted Odds Ratio
U5MR	Under-5 Mortality Rate

ABSTRACT

BACKGROUND: Under-5 children in KwaZulu-Natal are highly exposed to dying before reaching five years of life. Studies have been conducted to understand the demographic and socioeconomic factors that influence under-5 mortality, both nationally and internationally, with some contradicting findings on the association between some socioeconomic and demographic factors and under-5 mortality. While some studies found child mortality to be significantly associated with rural geographical place of residence, the reverse has also been established. The purpose of this study was to examine the association between socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal, South Africa.

DESIGN: The study was cross-sectional, and utilises 2011 Census secondary data set from Statistics SA. Overall, the census revealed that 55 476 children under the age of 5 had died in the 12 months prior to the census nationally. In KwaZulu-Natal this figure was 15 356. The 10% sample showed that 1 474 under-5 children had died in the same period in KwaZulu-Natal. STATA 12.0 was used for the analysis. Binary logistic regression model was used to examine the association between under-5 mortality and the independent variables.

RESULTS: The major findings of the study indicated that (i) male children were 1.22 times more likely to die compared to female children under the age of 5 years; (ii) mothers who had no schooling (AOR=1.82); mothers with primary level of education (AOR=2.43); and mothers with secondary level of education (AOR=1.77), were more likely to experience under-5 mortality compared to mothers with tertiary level education; (iii) mothers whose age at first birth was between 15-19 years (AOR=1.47) and those whose age at first birth was between 25-34 years (AOR=2.14) were more likely to experience under-5 mortality compared to mothers whose age at first birth was between 35-49 years; (iv) Black mothers were more likely to experience under-5 mortality compared to Indian mothers (AOR=5.99); (v) mothers who were employed were 1.22 times more likely to experience under-5 mortality compared to unemployed mothers. Lastly, under-5 mortality was less likely amongst mothers in the medium households compared to those from low income households (AOR=0.65).

CONCLUSION: This study found that socioeconomic and demographic factors substantively determine under-5 mortality in KwaZulu-Natal. Evidence from this study suggest that interventions aimed at reducing under-5 mortality should focus on black women, the younger women, the less educated and those with low household income.

KEYWORDS: Under-5 mortality – Socioeconomic factors – Demographic factors - Education level - Employment status – Age of child – Sex of child – Maternal age – Place of residence – Annual household income.

Chapter One: INTRODUCTION

1.1 BACKGROUND

Under-5 mortality levels are a reflection of the country's socio-economic conditions, and are indicative of the country's health care system and economic development, amongst other things (Rajaratnam et al, 2010). Children in South Africa and Southern African countries are at high risk of dying before their fifth year of life. In South Africa alone, thousands of children under the age of five years die each year (You et al., 2014). Estimates indicated that more than 7 million under-5 children died in 2010 worldwide, with at least 74% of these occurring among infants; and more than 50 000 child deaths were recorded in the South African Census 2011 (Rajaratnam et al, 2010; Statistics SA, 2012). Sub-Saharan African countries are the worst affected, and contribute 35% of all global deaths of children under the age of five years (Sanders, 2010). The Sub-Saharan African region reported an increase of under-5 deaths from 125 to 146 deaths per 1000 live births between the period 1990 and 2006, a 17% increase (UNICEF, 2008).

Diseases such as pneumonia (18%), diarrhoea (9%), malaria (7%), and meningitis and tetanus (6%) remain the leading causes of death among under-5 children globally (Statistics SA, 2013). In South Africa, HIV/AIDS, diarrhoeal diseases, lower respiratory infections, and low birth weight remain at the forefront of the diseases associated with child death in KwaZulu-Natal (SA Medical Research Council, 2000). In order to reduce high under-5 mortality levels in the country, the South African government has invested significant financial and other resources aimed at improving child health. Before the implementation of the National Development Plan, South Africa worked towards achieving Millennium Development Goal 4, which aimed to reduce child mortality by two-thirds. Some initiatives introduced by the government towards these aims were programmes such as the Negotiated Service Delivery Agreement 2010–2024, the Strategic Plan for Maternal, Newborn, Child and Women's Health, and the Campaign for Accelerated Reduction of Maternal and Child Mortality (Statistics SA, 2013). However, by 2013, little progress had been made as child mortality rates were still as high as 47 deaths per 1000 children under 5 years (Sanders, 2010; Statistics SA, 2013).

The literature shows that, in general, socioeconomic factors such as mother's level of education, employment status and annual household income are significant predictors of under-5 mortality. The Demographic factors such as mother's place of residence, maternal age and race have also been shown to be significantly associated with under-5 mortality.

In South Africa high unemployment rates (24% in the final quarter of 2014), low income levels, and high levels of poverty contribute to children within these households being deprived of basic services required for survival and optimal health, including having nutritious foods and basic healthcare services (Ester et al., 2011). The South African province of KwaZulu-Natal is particularly affected, with over 30% of households residing in rural areas, high unemployment rates (33%), illiteracy rates (22%), and higher under-5 mortality rates than in South Africa in general (Statistics SA, 2015). Out of a total of 55 476 under-5 deaths in South Africa in 2011, KwaZulu-Natal contributed the highest proportion (28%) of all deaths; followed by Gauteng (17%), Eastern Cape (14%), Limpopo (10%), Mpumalanga (9%), and the North West (9%). While the provinces of the Free State (7%), Western Cape (4%) and Northern Cape (2%) contributed the least (Statistics SA, 2012).

1.2 PROBLEM STATEMENT

High child mortality has negative implications for the country's developmental goals, and is often used as an indicator for population health in general. Furthermore, high under-five mortality contributes to lower life expectancies at birth. The South African 2011 Census showed that more than 50 000 children died in 2011 in the country, with more than 80% of these deaths occurring among infants. KwaZulu-Natal recorded more than 15 000 of these under-5 deaths during the same period, an increase from just above 8 000 in 1997 (Statistics SA, 2012; Nannan et al., 2012) – the highest amongst all the provinces in South Africa.

High under-5 mortality levels have proven to be a particular burden in KwaZulu-Natal, the South African province that also has the highest levels of unemployment and poverty in the country. The potential socioeconomic development is likely to be affected if such high infant and under-5 mortality rates remain. South Africa needs its population to participate in the developmental interventions and the labour force for it to succeed. The South African government is currently implementing programmes aimed at understanding and reducing child mortality, and at least R100 million a year will be used by the KwaZulu-Natal's Department of Social Development, over the next five years.

Studies have been conducted in similar areas both nationally and internationally, with some contradicting findings on the association between some socioeconomic and demographic factors

and under-5 mortality. While some studies found child mortality to be significantly associated with rural geographical place of residence, the reverse has also been established (Ettarh & Kimani, 2014; Kamniki et al, 2014). Likewise, some results have indicated that children born from younger mothers (below 20 years) were highly exposed (52%) to dying before reaching their fifth year of life (Ayotunde et al, 2009). Contrary to such findings, a study in Ghana found that children born from older mothers (35 years and above) were more at risk of dying before reaching five years (Kamniki et al, 2014). However, no studies that specifically focused in the KwaZulu-Natal province were found in the literature.

The purpose of this study was to examine the association between socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal, South Africa. The study focused on the following independent variables: namely; maternal race, maternal age at first birth, sex of child, mother's level of education, mother's employment status, household income and geographical place of residence (rural/urban); and the dependent variable was under-5 mortality.

1.3 JUSTIFICATION

KwaZulu-Natal experienced an extremely high number of deaths among under-5 children, according to the results of the 2011 South African Census. The province recorded more than 15 000 under-5 deaths in just a single year period (Statistics SA, 2012), which occurred despite the many initiatives implemented and a vast amount of financial and other resources spent by the government in an attempt to decrease the levels of under-five mortality in the province. Therefore, attempts aimed at fast-tracking child death reduction and investigating the root causes associated with such high mortality levels are crucial (Kanmiki et al., 2014). This is particularly true of KwaZulu-Natal – which has recorded both the highest levels of under-five mortality in the country; but also the high levels of illiteracy, unemployment and poverty.

This study will further contribute to Chapter 10 of South Africa's National Development Plan, which aims to "significantly" reduce the burden of mortality among under-5 children by 2030 (NDP, 2013). This Chapter further targets a reduction of infant mortality, currently at 34 deaths per 1000 live births, to less than 20 deaths per 1000 live births by 2030 (NDP, 2013). As part of the contribution to the country's development goals, this study's results will contribute to strategic

interventions aimed at addressing the challenges related to mother's socioeconomic and demographic factors viz-a-viz under-5 mortality.

1.4 RESEARCH QUESTION

Is there an association between mother's socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal, South Africa?

1.5 RESEARCH OBJECTIVE

Main Objective: To examine the association between mother's socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal, South Africa.

Specific Objectives

- To determine levels of under-5 mortality in KwaZulu-Natal, South Africa.
- To identify mother's socioeconomic and demographic factors associated with under-5 mortality in KwaZulu-Natal, South Africa.

1.6 DEFINITION OF TERMS

Under-5 mortality rate (U5MR): refers to the number of deaths of person/s in the first four years of life (0-4 years old) per 1000 live births. (Statistics SA, 2014; Sartorius et al., 2011).

Socioeconomic status: an individual or household's measure of economic status (wealth) and social position in relation to other members of the community and is based on level of education, employment status and individual or household income (Birken and Macarthur, 2004).

Age of child: refers to the length of time that a child has lived (Statistics SA, 2014). This indicator is measured by the number of days, months and years.

Sex of child: refers to the biological status of a child (Statistics SA, 2012). Typically, persons are classified as either male or female.

Mother's level of education: refers to the highest level of education that a mother has completed (Statistics SA, 2012). South Africa has twelve years of formal schooling, from grade 1 to grade 12. Therefore, the number of grades completed is used to refer to one's level of education at primary and secondary levels. At tertiary level the degree(s), diploma(s) or certificate(s) obtained are used to refer to tertiary level of education (Statistics SA, 2012).

Mother's employment status: refers to classification of whether a mother is participating in any economic activity or not (Statistics SA, 2012). For example, a mother may or may not have a regular job, a contract or a piece job.

Maternal age at first birth: refers to the age of the mother when the first child was born, even if the child died soon after birth (Statistics SA, 2012). This indicator excludes stillborns and miscarriages.

Geographical place of residence: refers to a geographical place (home, dwelling, and house) which a person reside in (Statistics SA, 2012). This indicator is typically classified as rural or urban.

Annual household income: the annual income for households is calculated by adding together the individual incomes of all members within a household (Statistics SA, 2012). This indicator includes all forms of income within a household such as salaries and wages, pension, retirement income, investment gains, etc.

Maternal race: refers to the mother's population group on the basis of various sets of physical characteristics (which usually result from genetic ancestry) (Birken and Macarthur, 2004). The South African population is typically classified as Black African, White, Indian or Coloured.

Chapter Two: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 LITERATURE REVIEW

This chapter aims to bring together the key results of literature that has focused on the contributing factors and levels of under-5 mortality in South Africa and internationally. The study purports to examine the association between socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal with a focus on geographical place of residence, biological mother's level of education, mother's employment status, household income, maternal age at first birth, maternal race and sex of child.

Children born and raised in sufficiently resourced urban areas are less likely to experience deaths when compared to children born and raised in inadequately resourced rural areas (Bbaale, 2011). Furthermore, in Sub-Saharan Africa, more than a million under-5 children die every year due to drinking unsafe water and poor sanitation (Ester et al., 2011; Sartorius et al., 2011). In rural areas, only 30% and 54% of the residents have access to basic sanitation and clean drinking water, respectively (Ester et al., 2011). Alternatively, urban residents have 52% and 83% of basic sanitation and clean drinking water, respectively (Ester et al., 2011).

Studies conducted by Woldemicael (2001), Wang (2003), and Azab et al (2014) revealed that children residing in the rural areas are at higher risk of being infected with diseases such as diarrhoea, compared to their urban counterparts. Such diseases have been known to influence child survival in sub-Saharan African countries. In South Africa there have been a disproportionately high number of cases of deaths associated with diseases such as diarrhoea in rural parts of Limpopo, North West and KwaZulu-Natal provinces. This may be due to differences in the provision of healthcare services and the burden of disease between urban and rural residents - hence it is importance of accounting for demographic factors such as place of residence when looking at socioeconomic differences in Sub-Saharan African countries viz-a-viz under-5 mortality (Zwane, 2007). In fact, studies conducted in South Africa have found differences in child mortality between urban and rural areas (Kanmiki et al., 2014; Garrib et al., 2011).

Although many studies have found under-5 mortality to be significantly associated with rural geographical place of residence, there has been some researchers who have found contradicting results to these. For example, the findings from a study conducted by Amouzou and Hill (2004)

found that under-5 children from semi-urban disadvantaged backgrounds are highly exposed to dying before reaching five years of survival compared to those residing in rural areas. South Africa is characterised with high volumes of urbanisation - and the shacks built nearby cities due to congestion in cities may have the influence on children residing in semi-urban areas being prone to mortality compared to rural dwellers (Amouzou and Hill, 2004).

Research shows that access to educational opportunities plays a critical role in improving one's economic status, hence improving children's chances of survival (Mosley & Chen, 1984; Kanmiki et al., 2014). Young children from mothers with formal and higher education (secondary, tertiary) are 45% and 76% respectively, less exposed to having their children die before the age of five compared to uneducated mothers (Kanmiki et al., 2014; Amouzou & Hill, 2004).

Additionally, mothers who have no formal education are more likely to remain unemployed, to get pregnant at a younger age, to have more babies, and to have little access to family planning programmes and medical care during pregnancy – therefore, they are less knowledgeable regarding the health and wellbeing of their children (Nattey et al., 2013; El-Zanaty, 2001; Sartorius et al, 2010). In Egypt only 17% of uneducated mothers receive maternal care regularly; while close to 80% of educated mothers with formal or higher education receive maternal care (Nattey et al., 2013). That being the case, mothers with higher level of education are mostly employed and are also able to influence child survival status by making the right choices related to nutrition, hygiene and illness prevention treatment (Nattey et al., 2013).

Furthermore, a person's level of education is also associated to their employment status and income level. Mothers who work away from home could be at a higher risk of having their child die before the age of five, as they are unable to care for their children. This has been found to negatively contribute to child survival status (Hobcraft et al, 1984; Kishor and Parasuraman, 1998). While this is the case, mothers who are able to care for their children and breastfeed regularly have been found to be less exposed to under-5 mortality (Mihrshahi et al., 2008). In South Africa, it is not uncommon for women to work or study away from their children, often leaving children in the care of relatives. The demand and value of education and employment has become increasingly over the years, with more and more women relocating to seek such opportunities. As a result, such mothers may not be able to breastfeed their children regularly. A study conducted (Worku, 2011) revealed that under-5 children who are not breastfed for at least first six months of life are 3.09 more times likely to die compared to their breastfed counterparts. Although mother's inability to breastfeed their children has been largely attributed to mothers

working away from home, the literature shows that uneducated mothers, mostly from rural areas, are unaware of the benefits of exclusive breastfeeding on their child's survival (Worku, 2011).

The impact of household income to under-5 mortality has been examined by many studies, with some contradicting findings. While some studies have shown household income as a significant predictor of under-5 mortality globally and in Africa, the reverse has also been revealed (O'Hare et al., 2013; Birchenall, 2007; Nattey et al., 2013; Awoonor-Williams et al., 2013; Swenson et al., 1993; Rahman et al., 2010; Welaga et al., 2013).

Children born to poor households, and in particular those in rural areas, have shown to have high disease burdens which ultimately lead to death when compared with their wealthier counterparts (O'Hare et al., 2013; Birchenall, 2007). Some of the diseases are related to malnutrition given the household's insufficient levels of income to buy nutritious foods (Birchenall, 2007). Poor households are well known to be residing in the environments that are characterised by overcrowding, poor health facilities and limited access to basic sanitation and services (Owusu and Kuitunen, 2005). Such conditions are likely to impact negatively on under-5 children's well-being and growth progress due to vulnerability to avoidable infections such children are exposed on (Birchenall, 2007).

Furthermore, children under-5 years of age who live in poor households are 40% to 50% more likely to die compared than those living in wealthier households (Nattey et al., 2013). Similar associations were also identified in studies conducted in Nigeria (Doctor, 2011) and Taiwan. In Taiwan it was found that children from poor households were significantly in higher risk of death within the first four years of life (Chiang, 1999).

However, a study conducted in Tanzania and another one in Ghana found that household income levels were not significantly associated with under-5 mortality (Awoonor-Williams et al., 2013; Swenson et al., 1993; Rahman et al., 2010; Welaga et al., 2013). Similar findings were also revealed in a study conducted in Southwest Nigeria and another one in South Africa (Okechukwu, 2015; Heaton & Amoateng, 2007). In support of such findings, the researcher has argued that household income may not necessarily have significant influence on infant mortality due to financial and moral support the mother is likely to receive from family members, friends and neighbours to ensure a healthy well-being for the mother and the child (Okechukwu, 2015). It is also important to note that financially stable families have the ability to support children through provision of basic healthcare services and nutritious foods (Heaton & Amoateng, 2007).

In South Africa, it is not uncommon that mothers receive social grant benefits from the government. Such grants are perceived to play an important role among poor households because mothers are able to provide nutritional foods for their children, which is likely to contribute to their children's well-being and survival status. Likewise, an increase in the household income has been shown to translate to the increased resource availability within the household, leading to declined under-5 mortality levels, due to improved exposure to basic needs necessary for the child survival (Charmabagwala et al., 2004).

Maternal age at first birth is crucial for understanding and predicting mortality risks of under-5 children (Ayotunde et al, 2009). Children born by younger mothers (whose age at first birth is below 20 years) are at a higher risk (52%) of dying before reaching five years of life (Ayotunde et al, 2009). Another study conducted in Ghana showed a significant association between infant mortality and mothers who were teenagers at first birth (Ssewanyana and Younger, 2007). Similar findings were also observed in another study, although no association was observed between under-5 mortality and mothers above the age of 34 years (Hobcraft et al, 1984).

Some of the explanations given for high infant and under-5 mortality rates among younger mothers relate to the fact that such mothers (less than 20 years) are most likely to give birth to children that experience preterm birth, low birth weight and asphyxia, conditions that falter child growth (Patton et al., 2009). Furthermore, adequate knowledge regarding pre- and post-natal health practices among teenage mothers is minimal (Heaton & Amoateng, 2007). Such practices such as proper medical attention and feeding practices are critical to under-5 survival and development status. Proper pre- and post-natal health care significantly decrease under-5 mortality (Heaton & Amoateng, 2007).

Contrary to such findings, a study in Ghana found that children born from older mothers (whose age at first birth was 35 years and above) were more at risk of dying before reaching five years of survival (Kamniki et al, 2014). Mothers whose age at first birth were 35 years and above were also found to experience more under-5 deaths compared to younger mothers in a study conducted by Charmabagwala et al. (2004). While this is alarming, the risks become worse for under-5 children of mothers with lower levels of education, low income, live in rural areas and who are unemployed (Singh and Tripathi, 2013; Ayotunde et al., 2009).

Comparing such contradicting findings from different studies suggest that in some settings both younger and/or older mothers may be expected to more likely experience under-5 mortality compared to mothers in the age group 20-34.

Disparities among different racial groups have also been reported in some studies. A study by Bradshaw et al. (1992) revealed that South African children under the age of 5 born of Black mothers were more at risk of dying than those born to mothers of other races (Coloured, White and Indian). Factors such as poverty, unemployment, lower levels of education, low income households, poor water and sanitation, and poor healthcare services are typically associated with the Black population (Burgard and Treiman, 2004). As such these factors contribute to Black mothers being highly exposed to under-5 mortality compared to their counterparts due to low access to quality of healthcare services and nutrition (Bradshaw et al., 1992).

South Africa is characterised with large households among the Black population. Large rural and poor families usually experience difficulty in managing demands of widespread impoverishment (Heaton & Amoateng, 2007). The living conditions among large families are likely to weaken child health due to malnutrition, insufficient parental attention given to children and poor illness recognition among under 5 children (Heaton & Amoateng, 2007). Infections are likely to spread easily as well among family members in such close proximity settings. As such, Black children are highly disadvantaged when compared to other racial categories.

A study conducted in India revealed that female children are more at risk (52%) of dying before reaching five years of life compared to their male counterparts, due to high preference for health care services given to boys (Claeson et al., 2000). A girl child is only taken to healthcare facilities when illness is at advanced stage, while the reverse is true for their male counterparts (Claeson et al., 2000).

Furthermore, male children are also shown preference with regards to food and feeding practices such as provision of nutritious foods - practices that may impact on female mortality superseding that of male mortality (Chen et al, 1981; Arokiasamy, 2002). In Africa and historically male children have been generally perceived as the future leaders and the heads of the households (Claeson et al., 2000; Krishnaji, 1995).

Another study conducted in India revealed sex differentials among under-5 mortality, particularly among working versus not-working mothers – where working mothers experienced more male

child mortality compared to their female counterparts (Krishnaji, 1995). The researcher justified that although more preference is given to male children in India, working mothers may have withdrawn such favouritism which may have had a significant influence on male children being exposed to mortality.

However, a study conducted by Sartorius et al (2011) revealed that male children are at a higher risk of under-five mortality than female children. Studies conducted in other parts of Africa found similar results, that male children were more likely to die before the age of five than females (Ssewanyana and Younger, 2007; Charmabagwala et al, 2004). In a study conducted by Richards et al., (2011), the researchers concluded that high favouritism towards female children may be due to traditional beliefs that bride money can bring wealth to the family. Biologically, female children are also known to live longer than their male counterparts (Ssewanyana and Younger, 2004).

Although the literature has shown that socioeconomic factors such as such as employment, income and education; and demographic factors such as maternal age, race and sex of the child are significant predictors for under-5 mortality, there have also been some contradicting findings on the association between some socioeconomic and demographic factors and under-5 mortality in Africa. This study aimed to examine the association between socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal province, South Africa.

2.2 THEORETICAL AND CONCEPTUAL FRAMEWORKS

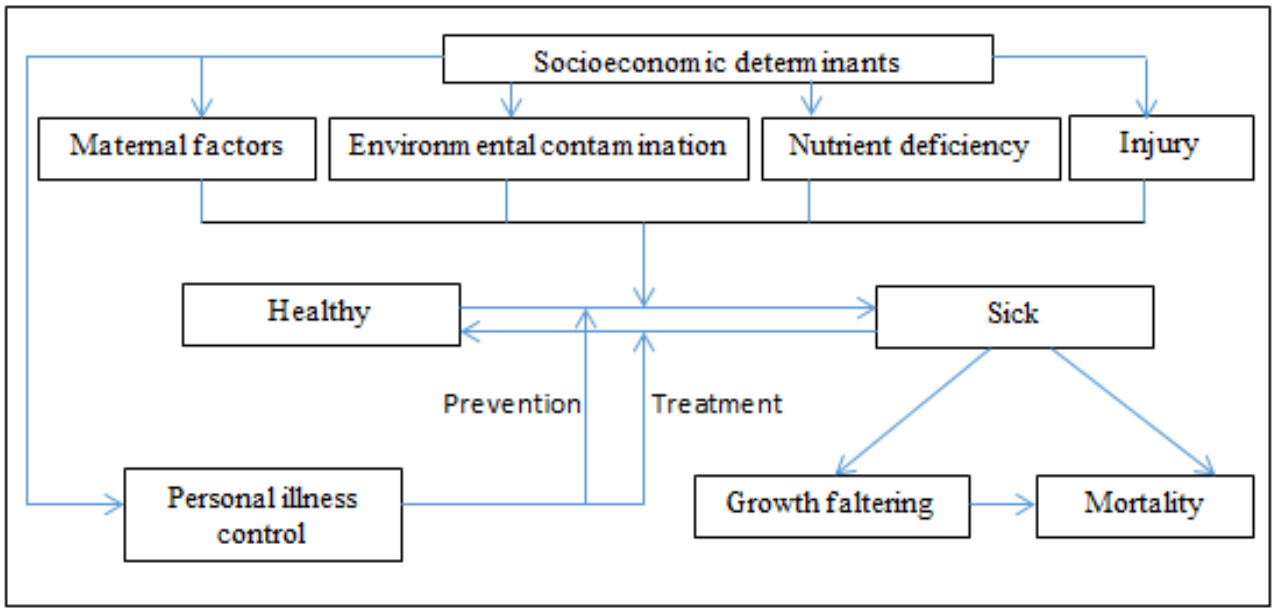
2.2.1 Theoretical Framework

Mosley and Chen's (1984) analytical framework discusses how proximate and intermediate factors contribute to child deaths among African countries. The framework further portrays socioeconomic factors and environmental factors as the determinants which are directly related to child mortality or survival. This study adopted Mosley and Chen's framework because the factors it describes as related to child mortality are relevant to what this study aims to examine.

Figure 2.1 shows a set of economic and social factors that contribute to child mortality. The Figure further indicates that biological and socioeconomic mechanisms play a significant role on child survival status. For example, maternal, biological environmental, nutritional and health seeking

behaviour factors have been shown to be the determinants that contribute to a child being healthy or sick. Maternal factors such as the age of the mother has been shown to either contribute to a child being sick or healthy. Depending on mother's knowledge, the child can benefit or disadvantaged when it comes to nutrition intake or access to better health services. If the latter is true, the child is highly exposed to sickness, growth faltering and even death. To understand the framework further, please refer to Figure 2.1 below.

Figure 2.1: Theoretical Framework for child survival in the developing countries, 1984

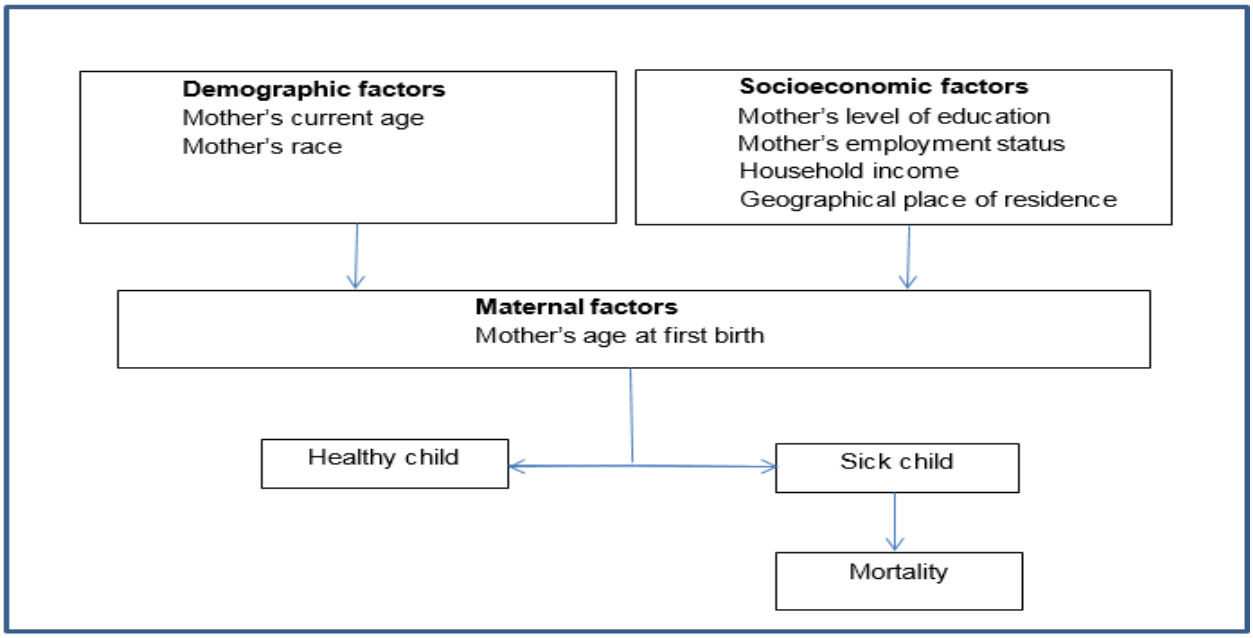


Source: Mosley & Chen, 1984

2.2.2 Conceptual Framework

Figure 2.2 describes how under-5 mortality is affected through demographic, socioeconomic and maternal factors. The connection between socioeconomic and demographic factors and under-5 mortality has been established in many studies. This study analysed how mothers' characteristics affect under-5 mortality, hence the adoption of Mosley and Chen's framework. Younger mothers, mostly Black mothers, and those residing in rural areas are characterised by poor socioeconomic factors such as low education levels, poor income, and unemployment (Singh et al., 2001). It is important to note that child care is the main responsibility of mothers, therefore when mothers are empowered through education and employment opportunities they become able to provide better healthcare and nutrition which plays an important role for their child survival (Singh et al., 2001).

Figure 2.2: Conceptual Framework for under-5 mortality in KwaZulu-Natal, 2011



Adopted from: Mosley & Chen, 1984

Furthermore, due to inexperience and lack of knowledge and guidance children born to younger mothers are at a higher risk of death before the age of five (Ayotunde et al., 2009). Children of younger mothers (below 20 years), whom reside in rural areas are especially at risk compared to those living in urban area (Ayotunde et al., 2009). This study adopted Mosley and Chen's (1984) framework by examining the biological mother's socioeconomic and demographic factors that may influence under-5 mortality in KwaZulu-Natal.

Chapter Three: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter provides detailed information on the study setting, study design, study population, as well as on the sample size and description of the study variables. The chapter further elaborates on techniques used to manage and analyse the data. The last section of the chapter highlights ethical issues pertaining to the study.

3.2 STUDY SETTING

KwaZulu-Natal province is located in the South Eastern part of South Africa. The province has the second largest population in the country (10 267 300), which is 19.8% of the country's estimated population (Statistics SA, 2012). The province has a higher illiteracy rate (21.8%) than the national rate (19.1%) for persons aged 15 years and older (Statistics SA, 2012). Furthermore, the province also has a higher unemployment rate than that of the national population – KwaZulu-Natal's unemployment rate was 33% in 2012, compared to the national unemployment rate of 29.8% (Statistics SA, 2012). The average annual household income of people living in KwaZulu-Natal is R83 053.00 (Statistics SA, 2012), and more than 30% of households in KwaZulu-Natal are situated in rural areas (Statistics SA, 2012).

3.3 STUDY DESIGN

The 10% sample of the South African 2011 Census, conducted by Statistics South Africa, was used for this study. The data sets were downloaded from the Statistics South Africa's database. The Census provides basic population and housing statistics essential for policy interventions, social and economic development, as well as monitoring and evaluation (Statistics SA, 2012). The 2011 Census was South Africa's third census since the country became a democratic republic in 1994; the two previous censuses were conducted in 1996 and 2001. Information gathered during the census pertains to people's demographics, migration patterns, education levels and status, health, employment, fertility, and information regarding the households in which they live (Statistics SA, 2012).

The 2011 Census was conducted from 9th to 31st October 2011. Three different types of questionnaires were used during the census, dependant on whether people were found in a (1) household, (2) transit or tourist hotel, or (3) an institution on the day they were interviewed (Statistics SA, 2012). The household questionnaire (see Appendix B) was used to collect information on all individuals found within a household. This questionnaire was divided into information pertaining to the person and the household. For the purpose of this study, the household questionnaire was utilised because it has all the variables this study aimed to analyse.

3.4 SAMPLE SIZE AND STUDY POPULATION

A total of 14 450 161 households were successfully interviewed across the country, 2 539 429 of these households were in KwaZulu-Natal (Statistics SA, 2012). The population size for the 2011 Census was 51 770 560. A total of 604 545 deaths were recorded in the mortality section. Overall, the census revealed that 55 476 children under the age of 5 had died in the 12 months prior to the census nationally. In KwaZulu-Natal this figure was 15 356, as reported by the mothers whose children had died. The information from KwaZulu-Natal also reported 777 288 under-5 children were alive (Statistics SA, 2012). The 10% sample showed that 1 474 under-5 children had died in the same period. The 10% sample further showed that the number of women who had their last child during the 5 years preceding the census, whether they experienced under-5 mortality or not, was 65 349.

3.5 DATA COLLECTION

Numerous procedures were utilised by Statistics South Africa aimed at collecting accurate information from households and individuals. A total of 120 000 enumerators were recruited for the census (Statistics SA, 2012). These enumerators went through trainings aimed at informing them regarding professional and ethical interviewing, as well as assuring questionnaire completion. Most interviews conducted by the enumerators were conducted on face-to-face. Follow-up visits were conducted with selected households in order to verify the information collected, and identify any errors that could have been made (Statistics SA, 2012). There were, however, some households that opted to self-administer the questionnaire. Such households

were provided with self-enumeration guides, which were written in different languages. Furthermore, a group of professionals carried out independent monitoring of census 2011 field activities.

3.6 QUESTIONNAIRE DESIGN

Rigorous tests and consultations were conducted by Statistics South Africa and relevant experts to ensure data collection tools (questionnaires) were well designed, easily understood and collected relevant information about the population (Statistics SA, 2012). Questionnaire development was determined by four quality dimensions (accuracy, relevance, interpretability and coherence) (Statistics SA, 2012).

3.7 DATA QUALITY

A series of quality assurance processes were implemented to ensure data quality was maintained. Such quality assurance processes were inclusive of data validation, data cleaning, and questionnaire verification (Statistics SA, 2012). Questionnaires were checked for consistency and were edited where necessary. Data was edited in collaboration with a group of experts and programmers. Fertility and mortality questions were asked of biological mothers between 12 and 50 years (Statistics SA, 2012). Mothers provided information regarding their children.

The mortality section was the last section on the questionnaire. As a result, respondents may have been exhausted at that time. This can be supported by the fact that a considerable amount of questionnaires were returned with non-responses in this section (Statistics SA, 2012). As such, this section is likely to have more errors than the others. Furthermore, fewer people responded to this section (compared to other sections), which could also be due to negative perceptions regarding mortality and its causes (Statistics SA, 2012).

The 2011 Census collected information on deaths that occurred in a household in the past 12 months prior to the census (Statistics SA, 2012). This section, however, had less than 5% of data on child's age at death missing. Although some errors were recognised during the recording of mortality data, these were attributed to scanning errors during the data capturing process

(Statistics SA, 2012). To solve this issue and reduce errors, cases with missing age at death had to be recaptured manually (Statistics SA, 2012). Such issues of data quality suggest that the findings of this study should be interpreted with caution (Kamangira, 2014).

3.8 SOCIOECONOMIC AND DEMOGRAPHIC VARIABLES

3.8.1 Dependent Variable

The dependent variable 'under-5 mortality' was derived by recoding and merging two variables:

(i) "*When was (name's) last child born, even if the child died soon after birth?*" If mothers could not remember the last child's birth day or month, they were encouraged to give the year at least. In cases where the mother had multiple births, only the last child was recorded. This question aimed to establish the age of the last child born. Responses were given in the form of days (01-31), months (01-12), and years.

(ii) "*Is (name's) last child born still alive?*" This question aimed to establish the last child's survival status at the time of the census. Respondents would indicate 'yes' if the child was still alive; 'no' if the child was dead; or 'do not know' if they did not know their last child's survival status.

Although responses to the above questions were inclusive of different age groups, this study's dependent variable has been recoded to focus only on responses referring to children under-5 years. To do this, only children born between the years 2006-2011 were kept in this study. All mortality cases were inclusive of both natural and unnatural deaths. The dependent variable is dichotomous, and as such was coded as 0=alive and 1=dead.

3.8.2 Independent Variables

Selection of the following independent variables was guided by the reviewed literature and the hypothetical foundation established from the reviewed literature. Many studies have revealed contradictory findings on the relationship between under-5 mortality and some of these selected variables. This study examined the variables at the individual level which included the characteristics of the mother and child.

Table 3.1 shows the list of independent variables used in this study, as well as the categories used and how they were coded.

Table 3.1 Description of independent variables, coding and measurement

Variable code	Variable name	How coded in this study	Measurement
Demographic variables			
P39_LASTCHILDSEX	Sex of child	Female (1) Male (2)	Nominal
P33_AGEFIRSTBIRTH	Maternal age at first birth	15-19 years (1) 20-24 years (2) 25-34 years (3) 35+ years (4)	Ordinal
P05_POP_GROUP	Maternal race	Black African (1) Coloured (2) Indian (3) White (4)	Nominal
P_GEOTYPE	Place of residence	Rural (1) Urban (2)	Nominal
Socioeconomic variables			
DERP_EDUCATIONAL_LEVEL	Mother's level of education	No schooling (0) Primary (1) Secondary (2) Tertiary (3)	Ordinal
DERP_EMPLOY_STATUS_OFFICIAL	Mother's employment status	Unemployed (1) Employed (2)	Nominal
DERH_INCOME_CLASS	Annual household income	Low (1) Medium (2) High (3)	Ordinal

3.8.2.1 Demographic variables

i. Sex of child

This variable referred to the sex of the last born child. In cases where the mother had given birth to twins or multiple births, only the child born last was recorded. This variable has two categories and was coded as 1=female and 2=male. Female was the reference category.

ii. Maternal age at first birth

This variable refers to the age of the mother when the first child was born alive, even if the child died soon after birth. As such, miscarriages and stillborns were excluded. Four categories were assigned to this variable and were coded as: 1=15-19; 2=20-24; 3=25-34 and 4=35-49 years. Mothers from age-group 35-49 years were used as the reference category.

iii. Maternal race

This variable referred to the racial category of the mothers. Four categories were assigned to this variable and coded as: 1=Black; 2=Coloured; 3=Indian and 4=White. Indian was the reference category.

iv. Geographical place of residence

This variable has two categories and it referred to the current place of residence of the mother. This variable was coded as 1=rural and 2=urban. Rural was the reference category.

3.8.2.2 *Socioeconomic variables:*

i. Mother's level of education

This variable referred to the highest level of education that the mother had completed. This variable comprised of four categories and was coded as follows: 0=no education, 1=primary, 2=secondary and 3=tertiary. Mothers who reported to have "tertiary education" were the reference category.

ii. Mother's employment status

This variable aimed to determine whether the mother was economically active. The questions asked only referred to employment status in the last seven (7) days prior to the census. This is a dichotomous variable and was coded as: 1=unemployed and 2=employed. Unemployed was the reference category.

iii. Annual household income

The calculation of annual household income involved adding together all individual members' income within a household. Respondents were required to rather give their income figures within a band/category instead of giving their exact income figures. Three categories were assigned to this variable and coded as: 1=low (band 1-6); 2=medium (band 7-9) and 3=high (band 10-12). Band 1-6 is made of R0 - R76800; 7-9 (R76 801 – R614 400) and 10-12 (R614 401 – or more) annual household incomes. Mothers from low annual income households were a reference category.

3.9 RESEARCH HYPOTHESIS

Socioeconomic and demographic factors are significant predictors of under-5 mortality in KwaZulu-Natal province, South Africa.

This hypothesis is supported by the empirical evidence that has revealed that mothers who are teenagers at first birth, have no formal education, are unemployed, come from poor households and/or reside in rural areas are highly likely to experience under-5 mortality compared to their counterparts (Kanmiki et al., 2014; Amouzou & Hill, 2004; Nattey et al., 2013; El-Zanaty, 2001; Sartorius et al, 2010; O'Hare et al., 2013; Birchenall, 2007; Singh and Tripathi, 2013; Ayotunde et al, 2009).

3.10 DATA ANALYSIS

The individual Person and the household data sets were merged to ensure that variables of interest are in one data set. STATA 12.0 was used for the analysis. The analysis only focused on this study's targeted population, which was the women residing in KwaZulu-Natal who had their last child during the 5 years preceding the census, whether they experienced under-5 mortality or not. The analysis was carried out in three stages or levels.

The first level of analysis performed was descriptive analysis (univariate) of under-5 mortality, demographic and socioeconomic variables. In this step the background characteristics of

respondents were described and summarised, and patterns between variables were discussed. In so doing, the frequency distribution and cross tabulations of each independent and dependent variable was carried out.

To estimate under-5 deaths in KwaZulu-Natal, the under-5 mortality rate (U5MR) formula was employed. The formula used was as follows:

$$\textbf{Under-5 mortality rate (U5MR)=} \frac{\text{Number of <5 year deaths in a given period}}{\text{Population of under-5 children in the same period}} * 1000$$

Source: Indrayan (2012)

The second step of analysis comprised of bivariate analysis, in which a binary logistic regression model was applied. These were used to estimate the probability of the association between each independent variable and the dependent variable. The odds ratios were used to interpret the results from this model. Pearson chi square (chi^2) was also performed to verify and confirm the level of significance between the dependent and each independent variable.

The third and final step of the analysis performed in this study was multivariate analysis, in which a logistic regression model was applied. This model was used to analyse variables that proved to be significantly associated ($p<0.05$) during the bivariate stage of analysis. Before performing the full logistic regression model, a pairwise correlation test was conducted to test for correlations between independent variables in the 2011 Census data. Pairwise correlation is used to assess whether correlations between independent variables are high or low. If the correlations between the independent variables are high, multicollinearity is said to occur. Therefore, it is recommended to conduct such tests before the logistic regression model is applied. Although minor multicollinearity may be accepted, severe multicollinearity is likely to make estimates sensitive even to moderate variations in the model due to the increase in the variance of coefficient estimates (Frost, 2013). This leads to coefficients being unstable and difficult to interpret (Frost, 2013).

The pairwise correlation test showed no issues of highly correlated independent variables (i.e. more than 0.5 coefficients) (see Appendix A2). Although statistically significant correlations were present between a few pairs of variables (e.g. mother's employment status and annual household income; mother's education level and annual household income; geographical place of residence

and annual household income), it was very weak. The highest correlation was observed between mother's employment status and annual household income, with a correlation coefficient of 0.2991*. This means that since the coefficients were below 0.5 there are no concerns of multicollinearity among independent variables.

The formula used in the logistic regression model was as follows:

$L_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_k X_{ki}$

The above formula can be explained as follows, where:

- L_i =dependent variable
- α = constant
- β_k = regression coefficients
- X = independent variables

Source: Freedman (2009)

The benefit of using the logistic regression model is that it does not assume a linear relationship between predictor and outcome variables. The model overcomes the limitations of a linear regression model when the dependent variable is dichotomous (Salkind, 2011).

For all the analysis the significance level was kept at the 0.05 ($p<0.05$) or lower, and at a confidence interval of 95%. Odds ratios (OR) were used to interpret the probability of the associations between the variables tested in this study. The adjusted and un-adjusted odds ratios were used to explain the probability of under-5 mortality occurring in KwaZulu-Natal. These were displayed on the models alongside p-values to show the level of significance among variables.

3.11 ETHICAL CONSIDERATIONS

No approval from the ethics board was necessary for this study since the study utilised a secondary dataset. To ensure confidentiality of respondents, no personal identifiers formed part of the dataset. Enumerators were asked to take an oath of confidentiality before enumeration (Statistics SA, 2012). Furthermore, informed consent was obtained from the respondents.

Chapter Four: RESULTS

4.1 INTRODUCTION

This chapter shows the results of the study based on univariate, bivariate and multivariate analyses. The first part of this chapter is comprised of descriptive statistics (univariate analysis), in which background characteristics of participants are described. Pearson chi square (chi^2) was also performed and is demonstrated in the results. Inferential statistics were done using binary logistic regression models for both bivariate and multivariate analyses. At bivariate level, logistic regression with one independent variable was performed and associations between variables were explored. Before performing the full logistic regression model, a pairwise correlation test was conducted to test for correlations between independent variables in the 2011 Census data. Odds ratios were used to interpret the results from adjusted and unadjusted logistic regression models.

4.2 DESCRIPTIVE STATISTICS

Table 4.1 shows that the proportion of children under 5 years of age in KwaZulu-Natal comprised of 50% males and 49% females. This suggests that the sample had a relatively equal distribution of male and female children.

Table 4.1: Background characteristics of under-5 children and mothers, KwaZulu-Natal, 2011

Background characteristics of respondents	Categories	Frequency (N=803 843)	Percent (%) of respondents by characteristic (Unweighted)
Sex of child	Female	392,566	48.84
	Male	404,538	50.33
	Missing	6,739	0.83
Total		**803,843**	**100.00**
Mother's education level	No schooling	37,881	4.71
	Primary	91,084	11.34
	Secondary	613,747	76.35
	Tertiary	60,163	7.48
	Missing	968	0.12
Total		**803,843**	**100.00**

Mother's employment status	Unemployed	598,123	74.41
	Employed	205,720	25.59
Total		**803,843**	**100.00**
Maternal age at first birth	15-19 years	335,645	41.76
	20-24 years	294,226	36.60
	25-34 years	127,432	15.85
	35+ years	9,054	1.13
	Missing	37,486	4.66
Total		**803,843**	**100.00**
Maternal race	Black	743,518	92.50
	Coloured	8,420	1.05
	Indian	34,086	4.24
	White	16,105	2.00
	Missing	1713	0.21
Total		**803,843**	**100.00**
Place of residence	Rural	435,660	54.20
	Urban	368,183	45.80
Total		**803,843**	**100.00**
Annual household income	Low	642,821	81.42
	Medium	135,824	17.20
	High	10,918	1.38
Total		**789,563**	**100.00**

The majority of the mothers (76%) in the sample had completed at least secondary school, while only 7% of the mothers had completed tertiary education. Fifteen percent (15%) of the mothers had either completed primary or no schooling at all. Zero percent (0.12%) were missing. Furthermore, only 26% of mothers in the sample were employed.

In Kwa-Zulu Natal province, the proportion of women whose age at first birth was between 15 and 19 years; had their last birth during the 5 years preceding the census was the highest (42%). Furthermore, almost all (94%) children under-5 years were born to mothers whose age at first birth was between 15 and 34 years. Five percent (5%) were missing.

The majority (93%) of mothers in the sample were Black, while only 1% were Coloured. Indian and White mothers accounted for 4% and 2% of the entire sample, respectively. Furthermore, more mothers in the sample lived in rural areas (54%) than urban areas (46%).

Most mothers (81%) belong to households categorised as low income households. This finding could be explained by the high levels (74%) of unemployment figures shown in the sample.

The first objective of this study was to determine levels of under-5 mortality in KwaZulu-Natal, South Africa. Table 4.2 shows the unweighted and weighted figures of age distribution of deaths under-5 years from the 10% sample of the Census 2011 in KwaZulu-Natal. Twenty percent of children who died in the sample were infants. Using the under-5 mortality rate (U5MR) formula to determine the levels of under-5 deaths in KwaZulu-Natal, calculations from the table figures revealed that the under-5 mortality rate (U5MR) was 22.65 per 1000 live births.

Table 4.2: Age distribution of deaths under-5 years, KwaZulu-Natal, 2011

	Unweighted (n=1,474)		Weighted (N=18,214)	
Survival status	**Frequency**	**Percent (%)**	**Frequency**	**Percent (%)**
Age of child (dead)				
0-11 months	291	19.74	3,590	19.71
1 years	368	24.97	4,564	25.06
2 years	307	20.83	3,779	20.75
3 years	252	17.10	3,129	17.18
4 years	256	17.37	3,152	17.31
	1,474	**100.00**	**18,214**	**100.00**

4.3 BIVARIATE ANALYSIS

At the bivariate level, the analysis tested the association between each variable in the study with under-5 mortality in KwaZulu-Natal.

Table 4.3 shows that there is a significant association between a child's gender and their survival status (p-value=0.000).

Table 4.3: Pearson chi square test between under-5 mortality and demographic and socioeconomic variables, KwaZulu-Natal, 2011

Determinants	Categories	Alive	Dead	p-value
Sex of child	Female	31,192 (49.04%)	639 (43.35%)	
	Male	31,980 (52.77%)	804 (54.55%)	
				Pr = 0.000
	Missing	433 (0.68%)	31 (2.10%)	
Total		**63,605 (100.00%)**	**1,474 (100.00%)**	

Mother's education level	No schooling	3,078 (4.84%)	73 (4.95%)	Pr =0.000
	Primary	7,203 (11.32%)	247 (16.76%)	
	Secondary	48,425 (76.13%)	1,110 (75.31%)	
	Tertiary	4,820 (7.58%)	44 (2.99%)	
	Missing	79 (0.12%)	0 (0.00%)	
Total		**63,605 (100.00%)**	**1,474 (100.00%)**	
Mother's employment status	Unemployed	47,546 (74.75%)	1,114 (75.58%)	Pr = 0.471
	Employed	16,059 (25.25%)	360 (24.42%)	
Total		**63,605 (100.00%)**	**1,474 (100.00%)**	
Maternal age at first birth	15-19 years	26,458 (41.60%)	726 (49.25%)	Pr = 0.000
	20-24 years	23,250 (36.55%)	478 (32.43%)	
	25-34 years	10,224 (16.07%)	152 (10.31%)	
	35+ years	740 (1.16%)	23 (1.56%)	
	Missing	1,554 (2.44%)	53 (3.60%)	
Total		**63,605 (100.00%)**	**1,474 (100.00%)**	
Maternal race	Black	58,542 (92.04%)	1,456 (98.78%)	Pr = 0.000
	Coloured	716 (1.13%)	5 (0.34%)	
	Indian	2,898 (4.56%)	8 (0.54%)	
	White	1,313 (2.06%)	3 (0.20%)	
	Missing	136 (0.21%)	2 (0.14%)	
Total		**63,605 (100.00%)**	**1,474 (100.00%)**	
Place of residence	Rural	35,003 (55.03%)	852 (57.80%)	Pr = 0.035
	Urban	28,602 (44.97%)	622 (42.20%)	
Total		**63,605 (100.00%)**	**1,474 (100.00%)**	
Annual household income	Low	50,756 (81.20%)	1,309 (90.46%)	Pr = 0.000
	Medium	10,867 (17.38%)	133 (9.19%)	
	High	886 (1.42%)	5 (0.35%)	
Total		**62,509 (100.00%)**	**1,447 (100.00%)**	

Table 4.3 shows that there is a significant association between mother's level of education and under-5 mortality (p-value=0.000). There was also a significant association between mothers' age at first birth and under-5 mortality (p-value=0.000). Mothers whose age at first birth was between 15 and 19 years were the most affected by deaths among under-5 children in KwaZulu-Natal (42%).

Table 4.3 shows that there was a significant association between maternal race and under-5 mortality (p-value=0.000). There was also significant association between geographical place of residence and under-5 mortality (p-value=0.035).

Lastly, Table 4.3 further shows that there was a significant association between annual household income and under-5 mortality (p-value=0.000). However, there is no association between mother's employment status and under-5 mortality (p-value=0.471).

Table 4.4 shows the unadjusted odds ratios between the dependent variable and each independent variable. For the results in Table 4.4 the reference categories were assigned as follows: sex of child (ref. = female); mother's education level (ref. = tertiary); mother's employment status (ref. = unemployed); maternal age at first birth (ref. = 35+ years); maternal race (ref. = Indian); place of residence (ref. = rural) and annual household income (ref. = low).

Table 4.4 shows that male children were 1.23 times more likely to die compared to a female child under the age of 5 years (95% CI 1.10 – 1.36).

Table 4.4: Model 1 - The unadjusted odds ratios for all variables in the study: logistic regression model with one independent variable, KwaZulu-Natal, 2011

Determinants	Categories	Odds ratios (Unadjusted)	P-value	95% conf. interval	
Sex of child (Ref.: Female)	Male	1.23	0.000	1.10	1.36
Mother's education level (Ref: Tertiary)	No schooling	2.60	0.000	1.78	3.79
	Primary	3.76	0.000	2.72	5.19
	Secondary	2.51	0.000	0.01	0.01
Mother's employment status (Ref: Unemployed)	Employed	0.96	0.471	0.85	1.08
Maternal age at first birth (Ref: 35+ years)	15-19 years	1.85	0.000	1.55	2.20
	20-24 years	1.38	0.001	1.15	1.66
	25-34 years	2.09	0.001	1.34	3.26
Maternal race (Ref: Indian)	Black	9.01	0.000	4.49	18.07
	Coloured	2.53	0.104	0.83	7.76
	White	0.83	0.780	0.22	3.12
Place of residence (Ref: Rural)	Urban	0.89	0.035	0.80	0.99

Annual household income	Medium	0.47	0.000	0.40	0.57
(Ref: Low)	High	0.22	0.001	0.09	0.53

* Ref=reference category

The mother's education level was significantly associated with under-5 mortality. The results show that under-5 mortality was 2.60 times more likely in mothers with no schooling compared to mothers with tertiary education (95% CI 1.78 – 3.79). In contrast, under-5 mortality was 3.76 times more likely in mothers with primary education compared to mothers with tertiary education (95% CI, 2.72 – 5.19). Finally, under-5 mortality is 2.51 times more likely amongst mothers with secondary schooling compared to mothers with a tertiary qualification (95% CI 0.01 – 0.01).

Table 4.4 shows that maternal age at first birth was significantly associated with under-5 mortality. Under-5 mortality was 1.85 times more likely amongst mothers whose age at first birth was between 15 -19 years compared to mothers whose age at first birth was 35 years and above (95% CI, 1.55 – 2.20). Furthermore, under-5 mortality was 1.38 times more likely amongst mothers whose age at first birth was between 20 - 24 years compared to mothers whose age at first birth was 35 years and above (95% CI, 1.15 – 1.66). Finally, under-5 mortality was 2.09 times more likely among mothers whose age at first birth was between 25 - 34 years compared to mothers whose age at first birth was 35 years and above (95% CI, 1.34 – 3.26).

The results show that under-5 mortality was 9.01 times more likely amongst Black mothers compared to Indian mothers (95% CI, 4.49 – 18.07). However, there was no significant association amongst White (p=0.780) and Coloured (p=0.104) mothers with under-5 mortality.

The results also show that geographical place of residence was significantly associated with under-5 mortality. Table 4.4 shows that under-5 mortality was 0.89 times less likely in mothers residing in urban areas compared to those from rural areas (95% CI, 0.80 – 0.99).

Lastly, the results from Table 4.4 show that annual household income is significantly associated with under-5 mortality in the KwaZulu-Natal province. The table shows that under-5 mortality was 0.47 times less likely amongst mothers in medium income households compared to those from low income households (95% CI, 0.40 – 0.57). The table further shows that under-5 mortality was 0.22 times less likely amongst mothers in the high income households compared to those from low income households (95% CI, 0.09 – 0.53).

There was no association between mother's employment status and under-5 mortality in the KwaZulu-Natal province (p=0.471).

4.4 MULTIVARIATE ANALYSIS

The second objective of this study was to identify mother's socioeconomic and demographic factors associated with under-5 mortality in KwaZulu-Natal, South Africa. These will be revealed in the tables below. Multivariate analyses are shown in the Tables 4.5 and 4.6. Both tables show the adjusted odds ratios between the dependent variable and the independent variables.

Model 2 is all-inclusive as it assesses all variables in the study; those that proved to be significantly associated with under-5 mortality at bivariate level; and those that showed no significant influence on under-5 mortality in KwaZulu-Natal.

Model 3 only assesses variables that proved to be significantly associated with under-5 mortality at bivariate level. These variables were: sex of child, mother's level of education, maternal age at first birth, maternal race, place of residence and annual household income. Mother's employment status was not significant predictor of under-5 mortality at bivariate level. However, this variable became an important variable in Model 2.

For the results shown in Table 4.5 and Table 4.6 reference categories were assigned as follows: sex of child (ref. = female); mother's education level (ref. = tertiary); mother's employment status (ref. = unemployed); maternal age at first birth (ref. = 35+ years); maternal race (ref. = Indian); place of residence (ref. = rural) and annual household income (ref. = low).

Table 4.5 shows that male children were 1.22 times more likely to die compared to female children under the age of 5 years (95% CI 1.10 – 1.37).

Table 4.5: Model 2 - The adjusted odds ratios for all variables in the study, KwaZulu-Natal, 2011

Determinants	Categories	Odds ratios (Adjusted)	P-value	95% interval	conf.
Sex of child (Ref.: Female)	Male	1.22	0.000	1.10	1.37

Mother's education level (Ref: Tertiary)	No schooling	1.90	0.002	1.26	2.89
	Primary	2.47	0.000	1.72	3.56
	Secondary	1.79	0.001	1.28	2.51
Mother's employment status (Ref: Unemployed)	Employed	1.21	0.005	1.06	1.39
Maternal age at first birth (Ref: 35+ years)	15-19 years	1.47	0.000	1.22	1.77
	20-24 years	1.16	0.124	0.96	1.40
	25-34 years	2.14	0.001	1.34	3.42
Maternal race (Ref: Indian)	Black	6.18	0.000	3.06	12.48
	Coloured	1.76	0.355	0.53	5.88
	White	0.70	0.649	0.15	3.30
Place of residence (Ref: Rural)	Urban	1.08	0.203	0.96	1.21
Annual household income (Ref: Low)	Medium	0.65	0.000	0.53	0.79
	High	0.47	0.100	0.19	1.16

The results from Table 4.5 show that mothers who had no schooling were 1.90 times more likely to experience under-5 mortality, compared to mothers with tertiary education (95% CI, 1.26 – 2.89). Mothers with a primary education were 2.47 times more likely to experience under-5 mortality, compared to mothers with tertiary education (95% CI, 1.72 – 3.56). Finally, mothers with a secondary education were also more likely (AOR=1.79) to experience under-5 mortality, compared to mothers with tertiary education (95% CI, 1.28 – 2.51).

Mothers who were employed were 1.21 times more likely to experience under-5 mortality, compared to unemployed mothers, in KwaZulu-Natal (95% CI, 1.06 – 1.39). Moreover, under-5 mortality was 1.47 times more likely amongst mothers whose age at first birth was between 15 - 20 years compared to mothers whose age at first birth was between the ages of 35 and 49 (95% CI, 1.22 – 1.77). Under-5 mortality was 2.14 times more likely amongst mothers whose age at first birth was between 25 - 34 years compared to mothers whose age at first birth was between the ages of 35 and 49 (95% CI, 1.34 – 3.42). However, no significant association was shown between mothers whose age at first birth was between 20 – 24 age group and under-5 mortality in KwaZulu-Natal (p=0.124).

Under-5 mortality was 6.18 times more likely amongst Black mothers compared to the Indian mothers (95% CI, 3.06 – 12.48). However, no significant association was shown between coloured mothers (p=0.355) and white mothers (p=0.649), and under-5 mortality in KwaZulu-Natal. No significant association was shown between place of residence and under-5 mortality at multivariate level (p=0.203).

Lastly, under-5 mortality was 0.65 times less likely in mothers in medium income households compared to those from low income households (95% CI, 0.53 – 0.79). However, no association was shown between mothers belonging to high income households compared to those from low income households at multivariate level (p=0.100).

Although mother's employment status was not statistically significant at bivariate level using chi-square and regression, it came as a significant variable on model 2. It should also be noted that place of residence became an insignificant variable on model 2, although this variable was statistically significant at bivariate level using chi-square and regression.

Table 4.6: Model 3 - The adjusted odds ratios for variables significantly associated with under-5 mortality at bivariate level, KwaZulu-Natal, 2011

Determinants	Categories	Odds ratios (Adjusted)	P-value	95% conf. interval	
Sex of child (Ref.: Female)	Male	1.22	0.000	1.10	1.37
Mother's education level (Ref: Tertiary)	No schooling	1.85	0.003	1.23	2.80
	Primary	2.43	0.000	1.69	3.45
	Secondary	1.77	0.001	1.27	2.49
Maternal age at first birth (Ref: 35+ years)	15-19 years	1.47	0.000	1.22	1.76
	20-24 years	1.16	0.132	0.96	1.40
	25-34 years	2.14	0.001	1.34	3.42
Maternal race (Ref: Indian)	Black	5.99	0.000	2.97	12.07
	Coloured	1.77	0.354	0.53	5.89
	White	0.69	0.641	0.15	3.27
Mother's employment status (Ref: Unemployed)	Employed	1.22	0.003	1.07	1.39

Annual household income	Medium	0.65	0.000	0.53	0.79
(Ref: Low)	High	0.48	0.106	0.20	1.17

* Ref=reference category

Table 4.6 shows that male children were 1.22 times more likely to die compared to female child under the age of 5 years (95% CI, 1.10 – 1.37) in Model 3.

The results further show that mothers who had no schooling were 1.82 times more likely to experience under-5 mortality (95% CI, 1.23 – 2.80), compared to mothers with a tertiary level education. Mothers with primary level of education were also more likely (AOR=2.43) to experience under-5 mortality compared with those with a tertiary education (95% CI, 1.69 – 3.45). Furthermore, mothers with secondary level of education were also more likely (AOR=1.77) to experience under-5 mortality compared to those with a tertiary education (95% CI, 1.27 – 2.49).

Under-5 mortality was 1.47 times more likely amongst mothers whose age at first birth was between 15 - 19 years, compared to mothers whose age at first birth was between 35 – 49 age group (95% CI, 1.22 – 1.76). Under-5 mortality was also 2.14 times more likely amongst mothers whose age at first birth was between 25 - 34 years, compared to mothers whose age at first birth was between 35 – 49 age group (95% CI, 1.34 – 3.42). However, no significant association was shown between mothers whose age at first birth was between the ages 20 - 24 years and under-5 mortality in KwaZulu-Natal (p=0.132).

Under-5 mortality was 5.99 times more likely amongst Black mothers compared to Indian mothers (95% CI, 2.97 – 12.07). However, no significant association was shown between Coloured (p=0.354) and White (p=0.641) mothers, and under-5 mortality in KwaZulu-Natal.

Mothers who were employed were 1.22 times more likely to experience under-5 mortality, compared to unemployed mothers, in KwaZulu-Natal (95% CI, 1.07 – 1.39).

Lastly, under-5 mortality was 0.65 times less likely amongst mothers in medium income households compared to those from low income households (95% CI, 0.53 – 0.79). No association was shown between mothers belonging to high income households compared to those from low income households at multivariate level (p=0.106).

Chapter Five: DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

This study examined the association between socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal, South Africa. The results revealed that socioeconomic and demographic factors are significant predictors of under-5 mortality in KwaZulu-Natal. The socioeconomic factors that were examined are mother's level of education, mother's employment status and annual household income. The study also examined demographic factors such as the sex of the child, maternal age at first birth, the racial category of the mother, as well as whether the mother resided in an urban or rural setting. This chapter aims to elaborate on what may be the contributing factors to the study's main findings.

5.2 DISCUSSION

5.2.1 Sex of child and under-5 mortality

This study revealed that sex of child was a significant predictor of under-5 mortality in KwaZulu-Natal. The results showed that under-5 male children are 1.22 more likely to die than their female counterparts at multivariate level. This study supports the findings from other studies which showed that infants and under-5 male children are more likely to die compared to female children (Singh and Tripathi, 2013; Nasejje et al., 2015; Krishnaji, 1995). Furthermore, these findings were consistent with the pattern of under-5 mortality by sex found both in the KwaZulu-Natal province as well as nationally (Statistics SA, 2012).

However, this contradicted findings from other studies conducted in India and in some African countries, which concluded that due to a high preference in some countries for male children, health care services are often prioritised for male children than for female children as they are perceived as the future leaders and the heads of the households (Claeson et al., 2000; Chen et al, 1981; Arokiasamy, 2002; Ssewanyana and Younger, 2007; Charmabagwala et al, 2004; Sartorius et al., 2011; Krishnaji, 1995).

The reasons for this study's finding may be due to the traditional practice of bride price – in which there is a preference toward the girl-child because it is believed that bride price can bring wealth

to the household, which may result in the neglect of male children (Richards et al., 2011). This finding is important for social planners and government interventions because it reveals issues of preferential treatment of certain children due to their sex. Biologically, male children have also been widely shown as highly likely to die before reaching five years of life compared to their female counterparts (Ssewanyana and Younger, 2007). Such sex differentials in under-5 mortality have remained a serious concern for many countries to achieving gender equality (Arokiasamy, 2004). Furthermore, sex bias in general may contribute to development failures of the province due to unequal allocation of resources and limited opportunities provided to women to contribute to development goals (Arokiasamy, 2004).

5.2.2 Mother's level of education and under-5 mortality

Another finding that supports the literature was that children under the age of five years born to mothers who had formal and high levels of education are less likely to die before reaching the age of five, compared to those born to mothers who have lower or no formal education at all. These results were significant predictors in both the adjusted and unadjusted models. Similar findings were also found in a study conducted by Owusu and Kuitunen (2005). The results of this study further supported Mosley and Chen's (1984) framework which revealed mother's level of education as a significant predictor of under-5 mortality in developing countries. More studies have also revealed that mother's education is a significant predictor of child mortality (Cleland, 1990; Hobcraft, 1993; Hobcraft, et al., 1984).

The reasons for these findings may be due to the fact that more educated mothers are better equipped and knowledgeable about antenatal care, better feeding practices and, in general, – educated mothers are more alert regarding preventive measures of diseases that may contribute to their children's death (Barrera, A. 1990 Nattey et al., 2013; El-Zanaty, 2001; Sartorius et al, 2010). Uneducated mothers are more likely to lack knowledge regarding the health benefits that vaccinations may have on a child's survival status, for example (Sartorius et al, 2010). Such mothers further utilise public health services more frequently than mothers with less or no schooling (Caldwell, 1981; Sartorius et al, 2010).

In spite of the substantial progress South Africa has made in providing educational opportunities for women, KwaZulu-Natal is still performing below the required standard (Statistics SA, 2012). Such findings suggest the importance of encouraging and empowering women through provision of equal education opportunities. This finding is important for social planners and government

structures because it reveals the importance of strategically aligning resources and improving interventions aimed at increasing access to education for women. The higher the educational level of the mother, the less the risk that her under-5 child will die (Kanmiki et al., 2014; Amouzou & Hill, 2004). The result further suggests that policies aimed at keeping women at schools should not only be strengthened at lower (primary) and secondary levels of education, but also at tertiary level for, inter alia, reducing child mortality in KwaZulu-Natal.

5.2.3 Maternal age at first birth and under-5 mortality

Significant associations were revealed among mother's age at first birth and under-5 mortality in KwaZulu-Natal. However, there have been contradictory findings from different countries regarding the association between mother's age at first birth and under-5 mortality. Some studies have found that children, born by mothers whose age at first birth is 15-19 years (teenagers), are most likely to die before reaching five years; while others have found that mothers whose age at first birth is 35 years and above are the ones highly associated with under-5 mortality (Ayotunde, et al, 2009; Kamniki et al, 2014).

This study found that teenage mothers (mothers whose age at first birth was in the 15 – 19 age group) and mothers in the 25 – 34 age group were the groups most likely to experience under-5 mortality in KwaZulu-Natal when compared to mothers whose age at first birth was 35 to 49 years. Mothers whose age at first birth was between 20 - 24 age group showed no significant association with under-5 mortality in KwaZulu-Natal.

The issue of teenage pregnancy has been a serious social and public health concern in South Africa for many years – because this age group lacks knowledge regarding the care of their children which contributes to high under-5 mortality. It has been raised in previous studies that under-5 mortality is more likely among mothers with lower level of education and those that reside in the rural areas due to lack of knowledge regarding antenatal care, better feeding practices, and lack of healthcare utilisation (Barrera, 1990; Caldwell, 1981; Mosley and Chen's, 1984; Caldwell, 1981; Sartorius et al, 2010).

This finding may be beneficial to social institutions such as the Department of Social Development because it reveals the significance of encouraging and retaining the girl child in school. Further research should be conducted to investigate the underlying causes between the association of

under-five mortality amongst mothers whose age at first birth is between 25 – 34 age group in KwaZulu-Natal, as this result is inconsistent with what has been found in the literature.

5.2.4 Annual household income and under-5 mortality

The results of this study regarding the association between under five mortality and annual household income are similar to those revealed by other studies (Ujunwa and Ezeonu, 2014; Owusu and Kuitunen, 2005; Birchenall, 2007). This study showed that mothers belonging to middle annual income households are less likely to experience under-5 mortality compared to those from lower/poor annual income households. No association was shown between mothers belonging to high income households compared to those from low income households at multivariate analysis stage, although significant association was revealed between this category and under-5 mortality at bivariate stage.

Poor households mostly reside in crowded environments with limited or no access to basic sanitation and services, and limited access to health facilities (Owusu and Kuitunen, 2005). Poor households have sub-optimal access and provision of healthcare services and often cannot afford nutritious foods, increasing the likelihood that under five children living in these environments are malnourished compared to children from richer households (Doctor, 2011). As such, under-5 children from such households become more vulnerable to infections that may contribute to their death (Birchenall, 2007).

This finding is important and beneficial for government structures because it suggests the importance of improving and strengthening of healthcare systems to escalate access to quality of health for poor households. The results from other studies show that household income may have alarming consequences for under-5 population health such as malnutrition, sickness and access to quality healthcare services (Ettarh and Kimani, 2012). Fast-tracking the National Health Insurance (NHI), a government initiative aimed at ensuring that all South African citizens have access to appropriate, efficient and quality health services, is key to addressing healthcare challenges.

Improving the provision of social grants (Child Support Grant) and employment opportunities to mothers/women may be necessary to improve the annual household status among poor families. This, in turn may help mothers provide nutritious foods for their children despite dire financial circumstances and unemployment among poor families.

5.3 CONCLUSIONS

This study found that socioeconomic and demographic factors substantively determine under-5 mortality in KwaZulu-Natal. Evidence from this study suggests that there is a higher risk of under-5 mortality among women who are less educated, younger, black, poor and reside in rural areas.

The findings of this study may draw interest to the KwaZulu-Natal's Department of Social Development, the Department of Health and the South African government at large because the issues pertaining to the association between socioeconomic and demographic factors and under-5 mortality in KwaZulu-Natal may be relevant to other provinces. Understanding of these factors and their contribution to the high infant and under-5 mortality levels in KwaZulu-Natal is critical for addressing the challenges and improving child health and survival status.

This study's findings may further provide indications to policy and decision makers regarding the necessary programmes/interventions to be prioritised to reduce the burden of under-5 mortality in KwaZulu-Natal. Government policies such as the National Health Insurance (NHI) and the National Development Plan (NDP) may also benefit. Interventions aimed at addressing the enormous socioeconomic differences in KwaZulu-Natal, and South Africa in general remain paramount to reducing high under-5 mortality levels in the country. For example, keeping women at schools should not only be strengthened at lower (primary) and secondary levels of education, but also at tertiary levels. Social issues such as women empowerment and gender equality remain important for child survival status.

5.4 STUDY LIMITATIONS

The study is not based on death records but on self-reported data from mothers. Therefore, the information obtained from the mother could be incorrect due to incorrect recalling of the child's birth or death date, especially if no death certificate is referred to. Furthermore, there was some missing data observed in the data set. Although this is the case, the missing data was minimal (except for *maternal age at first birth* - 5%); therefore it is unlikely to have significant influence on this study's findings (if any). Although still relevant, the data source used in this study is not recent. There may have been some changes since the Census 2011 was conducted. Furthermore, this study was not able to establish a cause-effect relationship since it is cross-sectional.

Chapter Six: RECOMMENDATIONS AND POLICY IMPLICATIONS

This study revealed some findings which the KwaZulu-Natal government, social planners, researchers and policy makers may need to consider to improve child survival status. Due to such high significant associations between mother's education level and under-5 mortality in KwaZulu-Natal, enriching policies aimed at improving access and keeping women at schools should not only be strengthened at lower (primary) and secondary levels of education but also at tertiary levels.

Studies by Hobcraft, et al. (1984), Cleland (1990) and Hobcraft (1993) also revealed the importance of educating mothers in relation to child survival status. As such, women empowerment through education is of utmost importance in relation to income, maternal age at first birth, employment status and the general provision of healthcare services and nutritious foods important for child survival (Ujunwa and Ezeonu, 2014). Because higher educated women have been shown to utilise healthcare services more compared to those with less or no education, it is important that women empowerment interventions be aligned with education.

Rural community development strategies and programmes should be strengthened and the progress monitored in KwaZulu-Natal for the purpose of fighting against poverty while providing opportunities for growth. Government's collaborations with local businesses to improve employment and educational opportunities for Black women residing in rural areas should be regularly evaluated to inform interventions and ensure successful implementation of programmes. This may also improve annual household income. As a result, this may improve the chances of children getting better healthcare services and nutrition which would positively influence their survival status (Birchenall, 2007).

Healthcare services should be improved and brought closer to the rural communities. Although building such services closer to the communities is important, it is also vital that clinics be stocked with sufficient medication and adequately staffed with human resources. This study's findings also suggest the importance of pre-and post-natal health education among mothers.

It is essential to further investigate the effect of mother's employment status on under-5 mortality in KwaZulu-Natal. It is also recommended that further research be conducted to investigate the association between under-5 mortality and mothers in the 20 – 24 age group.

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APPENDICES

Appendix A1: Two-sample t test with equal variances

```
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
   Alive |   61882    803.8707    2.067638    514.3476    799.8181    807.9233
    Dead |    1413    797.9115    13.51861     508.163    771.3928    824.4303
---------+--------------------------------------------------------------------
combined |   63295    803.7377    2.043871    514.2072    799.7317    807.7437
---------+--------------------------------------------------------------------
    diff |             5.95917    13.83478               -21.15703    33.07537
------------------------------------------------------------------------------
    diff = mean(Alive) - mean(Dead)                               t =   0.4307
Ho: diff = 0                                     degrees of freedom =    63293

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.6667         Pr(|T| > |t|) = 0.6667          Pr(T > t) = 0.3333
```

Appendix A2: Correlation between independent variables in Census 2011 data, KZN, 2011

	Sex of child	Mother's education level	Mother's employment status	Maternal age	Race	Residence	Household income
Sex of child	1.0000	-0.0005	0.0092*	0.0014	-0.0058	0.0095*	0.0039
Mother's education level		1.0000	-0.1708*	0.0777*	-0.0840*	-0.0552*	-0.2581*
Mother's employment status			1.0000	-0.0666*	0.0569*	0.2345*	0.2991*
Maternal age				1.0000	-0.0297*	-0.0587*	-0.0880*
Race					1.0000	0.0025	0.0997*
Place of residence						1.0000	0.2380*
Household income							1.0000

Appendix A3: Model 2 - The adjusted odds ratios for all variables in the study, KwaZulu-Natal, 2011

```
Logistic regression                               Number of obs   =      60359
                                                  LR chi2(18)     =     257.18
                                                  Prob > chi2     =     0.0000
Log likelihood = -6226.6063                       Pseudo R2       =     0.0202

------------------------------------------------------------------------------
 U5_mortality | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
_ISex_Child_2 |   1.224696   .0686846     3.61   0.000     1.097212    1.366993
_IEducation_1 |   1.912376   .4044535     3.07   0.002     1.263428    2.894651
_IEducation_2 |   2.478602   .4589157     4.90   0.000     1.724273    3.562933
_IEducation_3 |   1.789221    .309079     3.37   0.001     1.275331    2.510179
_IEmploymen_2 |   1.211388   .0835965     2.78   0.005     1.058139    1.386832
   _Iagecat_2 |   1.469932   .1378541     4.11   0.000      1.22312    1.766546
   _Iagecat_3 |   1.161222   .1128551     1.54   0.124     .9598206    1.404885
   _Iagecat_4 |   2.141323   .5102874     3.20   0.001     1.342261    3.416076
   _Irace_m_2 |    6.17615   2.216431     5.07   0.000     3.056664    12.47924
   _Irace_m_3 |   1.764776   1.084227     0.92   0.355     .5293414    5.883601
   _Irace_m_4 |   .6968615   .5527064    -0.46   0.649     .1472405    3.298113
    _Iurban_2 |   1.077897   .0635479     1.27   0.203     .9602725     1.20993
_Ihh_income_2 |   .6455901   .0653177    -4.33   0.000     .5294639     .787186
_Ihh_income_3 |   .4740006   .2154145    -1.64   0.100     .1945098    1.155091
        _cons |   .0014527   .0005934   -16.00   0.000     .0006524     .003235
------------------------------------------------------------------------------
```

Appendix A4: Model 3 - The adjusted odds ratios for variables significantly associated with under-5 mortality at bivariate level, KwaZulu-Natal, 2011

```
Logistic regression                                     Number of obs   =      60359
                                                        LR chi2(13)     =     253.98
                                                        Prob > chi2     =     0.0000
Log likelihood = -6228.2049                             Pseudo R2       =     0.0200

------------------------------------------------------------------------------
 U5_mortality | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------+---------------------------------------------------------------
_ISex_Child_2 |   1.224314   .0686565     3.61   0.000     1.096881    1.366552
_IEducation_1 |   1.854117   .3900622     2.93   0.003     1.227622    2.800334
_IEducation_2 |   2.428148   .4481082     4.81   0.000     1.691173    3.486278
_IEducation_3 |   1.774828    .306331     3.32   0.001     1.265439    2.489268
_IEmploymen_2 |   1.220145   .0827437     2.93   0.003     1.068286    1.393591
   _Iagecat_2 |   1.466821   .1375215     4.09   0.000     1.220599    1.762712
   _Iagecat_3 |   1.15758    .1124523     1.51   0.132     .9568892    1.400362
   _Iagecat_4 |   2.143677   .5108013     3.20   0.001     1.343794    3.419684
   _Irace_m_2 |   5.986222    2.14287     5.00   0.000     2.967911     12.0741
   _Irace_m_3 |   1.768005   1.086194     0.93   0.354     .5303199    5.894254
   _Irace_m_4 |   .6904914   .5476006    -0.47   0.641     .1459167    3.267469
_Ihh_income_2 |   .6517274    .065785    -4.24   0.000     .5347443    .7943023
_Ihh_income_3 |   .4798241   .2180127    -1.62   0.106     .1969384    1.169052
        _cons |   .0015542   .0006223   -16.15   0.000      .000709    .0034068
------------------------------------------------------------------------------
```

Appendix A5: Linktest

```
Logistic regression                                     Number of obs   =      60359
                                                        LR chi2(2)      =     107.91
                                                        Prob > chi2     =     0.0000
Log likelihood =  -6301.243                             Pseudo R2       =     0.0085

------------------------------------------------------------------------------
U5_mortality |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        _hat |   .3839445   2.029176     0.19   0.850    -3.593167    4.361056
      _hatsq |  -.0761985   .2507735    -0.30   0.761    -.5677056    .4153086
       _cons |  -1.233895    4.07673    -0.30   0.762    -9.224139    6.756349
------------------------------------------------------------------------------
```

Appendix A6: Hosmer & Lemeshow's goodness-of-fit

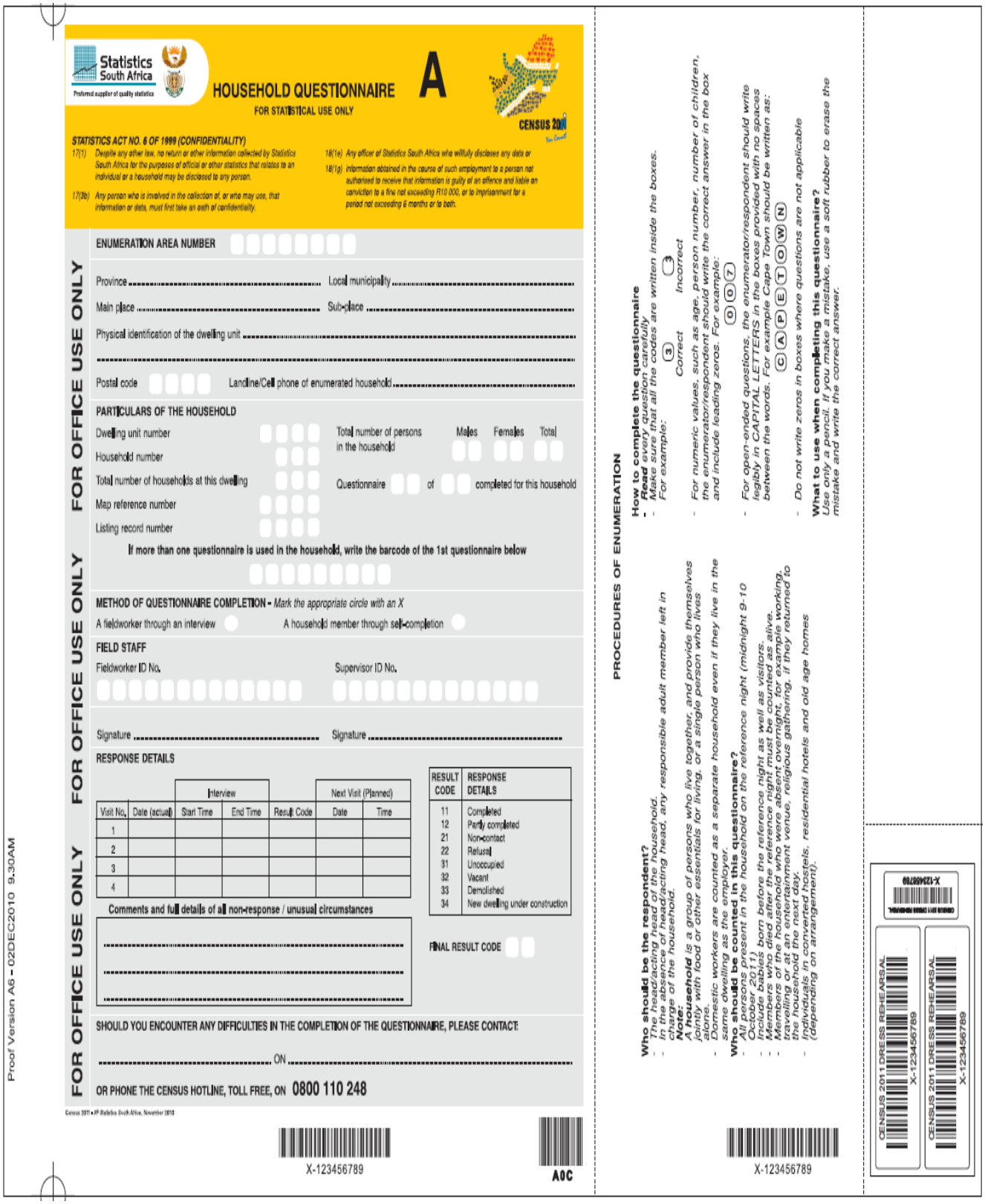
Logistic model for U5_mortality, goodness-of-fit test

(Table collapsed on quantiles of estimated probabilities)

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.0116	56	58.8	5986	5983.2	6042
2	0.0194	87	83.4	5984	5987.6	6071
3	0.0212	131	123.5	5866	5873.5	5997
4	0.0220	130	130.4	5905	5904.6	6035
5	0.0228	134	140.0	6115	6109.0	6249
6	0.0245	146	137.4	5694	5702.6	5840
7	0.0257	155	152.3	5897	5899.7	6052
8	0.0267	138	161.7	6021	5997.3	6159
9	0.0277	188	171.1	6096	6112.9	6284
10	0.0328	156	162.4	5474	5467.6	5630

number of observations = 60359
number of groups = 10
Hosmer-Lemeshow chi2(8) = 7.16
Prob > chi2 = 0.5190

APPENDIX B: Census 2011 Household Questionnaire



Statistics South Africa
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HOUSEHOLD QUESTIONNAIRE

FOR STATISTICAL USE ONLY

A

CENSUS 2011

STATISTICS ACT NO. 6 OF 1999 (CONFIDENTIALITY)

17(1) Despite any other law, no return or other information collected by Statistics South Africa for the purposes of official or other statistics that relates to an individual or a household may be disclosed to any person.

17(3b) Any person who is involved in the collection of, or who may use, that information or data, must first take an oath of confidentiality.

18(1e) Any officer of Statistics South Africa who wilfully discloses any data or

18(1g) information obtained in the course of such employment to a person not authorised to receive that information is guilty of an offence and liable on conviction to a fine not exceeding R10 000, or to imprisonment for a period not exceeding 6 months or to both.

FOR OFFICE USE ONLY

ENUMERATION AREA NUMBER

Province ..... Local municipality .....

Main place ..... Sub-place .....

Physical identification of the dwelling unit .....

.....

Postal code Landline/Cell phone of enumerated household .....

PARTICULARS OF THE HOUSEHOLD

Dwelling unit number

Household number

Total number of households at this dwelling

Map reference number

Listing record number

Total number of persons in the household — Males Females Total

Questionnaire of completed for this household

If more than one questionnaire is used in the household, write the barcode of the 1st questionnaire below

METHOD OF QUESTIONNAIRE COMPLETION - *Mark the appropriate circle with an X*

A fieldworker through an interview ○ A household member through self-completion ○

FIELD STAFF

Fieldworker ID No. Supervisor ID No.

Signature ..... Signature .....

RESPONSE DETAILS

	Interview				Next Visit (Planned)	
Visit No.	Date (actual)	Start Time	End Time	Result Code	Date	Time
1						
2						
3						
4						

RESULT CODE	RESPONSE DETAILS
11	Completed
12	Partly completed
21	Non-contact
22	Refusal
31	Unoccupied
32	Vacant
33	Demolished
34	New dwelling under construction

Comments and full details of all non-response / unusual circumstances

.....

.....

.....

FINAL RESULT CODE

SHOULD YOU ENCOUNTER ANY DIFFICULTIES IN THE COMPLETION OF THE QUESTIONNAIRE, PLEASE CONTACT:

..... ON .....

OR PHONE THE CENSUS HOTLINE, TOLL FREE, ON **0800 110 248**

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A0C

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PROCEDURES OF ENUMERATION

How to complete the questionnaire

- *Read every question carefully*
- *Make sure that all the codes are written inside the boxes.*
- *For example:*

(3) Correct (3 Incorrect

- *For numeric values, such as age, person number, number of children, the enumerator/respondent should write the correct answer in the box and include leading zeros. For example:*

(0)(0)(7)

- *For open-ended questions, the enumerator/respondent should write legibly in CAPITAL LETTERS in the boxes provided with no spaces between the words. For example Cape Town should be written as:*

(C)(A)(P)(E)(T)(O)(W)(N)

- *Do not write zeros in boxes where questions are not applicable*

What to use when completing this questionnaire?

Use only a pencil. If you make a mistake, use a soft rubber to erase the mistake and write the correct answer.

Who should be the respondent?

- *The head/acting head of the household.*
- *In the absence of head/acting head, any responsible adult member left in charge of the household.*

Note:

***A household** is a group of persons who live together, and provide themselves jointly with food or other essentials for living, or a single person who lives alone.*

- *Domestic workers are counted as a separate household even if they live in the same dwelling as the employer.*

Who should be counted in this questionnaire?

- *All persons present in the household on the reference night (midnight 9-10 October 2011)*
- *Include babies born before the reference night as well as visitors.*
- *Members who died after the reference night must be counted as alive.*
- *Members of the household who were absent overnight, for example working, travelling or at an entertainment venue, religious gathering, if they returned to the household the next day.*
- *Individuals in converted hostels, residential hotels and old age homes (depending on arrangement).*

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CENSUS 2011 DRESS REHEARSAL X-123456789

CENSUS 2011 DRESS REHEARSAL X-123456789

FLAP: PARTICULARS OF ALL INDIVIDUALS

Please write the name and surname of the household head and first names of every person who was present in this household on the census night (midnight 9–10 October 2011)
One name on each row. Start with head or acting head of household.

The head or acting head is the person who is the main decision-maker of the household. If people are equally decision-makers, then take the oldest person as the household head.
For babies with no name, write BABY.

Please include babies, small children, old people and visitors who were present in this household on the census night (9–10 October 2011)

F-00 PERSON NUMBER	F-01 PERSON NAME	F-02 AGE IN COMPLETED YEARS	F-03 SEX 1 = Male 2 = Female
Write 0 or 1 in the first box for all persons listed on the flap. Example: Row 1: 0 1 Row 10: 1 0	Example: J O H N M A L U / L E K E	Example 1: 0 3 1 / Example 2 (Child less than 1 year): 0 0 0	Example: X 1 Male / 2 Female. Mark the appropriate circle with an X.
1			1 Male / 2 Female
2			1 Male / 2 Female
3			1 Male / 2 Female
4			1 Male / 2 Female
5			1 Male / 2 Female
6			1 Male / 2 Female
7			1 Male / 2 Female
8			1 Male / 2 Female
9			1 Male / 2 Female
0			1 Male / 2 Female

A0F

SECTION A: DEMOGRAPHICS • ASK OF EVERYONE LISTED ON THE FLAP

P-01 DATE OF BIRTH	P-02 RELATIONSHIP	P-03 MARITAL STATUS	P-04 SPOUSE OR PARTNER	P-05 POPULATION GROUP	P-06 LANGUAGE
What is *(name's)* date of birth? Example: 1 9 / 0 4 / 1 9 7 9	**What is *(name's)* relationship to the head or acting head of the household?** *The head or acting head is the person listed in row 1 of the first questionnaire, if more than one questionnaire has been completed for this household.* 01 = Head/Acting Head; 02 = Husband/Wife/Partner; 03 = Son/Daughter; 04 = Adopted Son/Daughter; 05 = Stepchild; 06 = Brother/Sister; 07 = Parent (Mother/Father); 08 = Parent-in-law; 09 = Grand/Great Grandchild; 10 = Son/Daughter-in-law; 11 = Brother/Sister-in-law; 12 = Grandmother/Father; 13 = Other relative; 14 = Non-related person. *Write the appropriate code in the boxes.*	**What is *(name's)* PRESENT marital status?** 1 = Married; 2 = Living together like married partners; 3 = Never married; 4 = Widower/widow; 5 = Separated; 6 = Divorced. *Write the appropriate code in the box.* ***If 3-6, Go to P-05***	**Who in this household is *(name's)* spouse or partner?** *Write the **person number** of the spouse or partner in the appropriate boxes. If the spouse or partner does not reside in the household, **write 98.*** ***Note:** Refer to person on flap e.g. 02*	**How would *(name)* describe him/herself in terms of population group?** 1 = Black African; 2 = Coloured; 3 = Indian or Asian; 4 = White; 5 = Other. *Write the appropriate code in the box.*	**Which two languages does *(name)* speak most often in this household?** 01 = Afrikaans; 02 = English; 03 = IsiNdebele; 04 = IsiXhosa; 05 = IsiZulu; 06 = Sepedi; 07 = Sesotho; 08 = Setswana; 09 = SiSwati; 10 = Tshivenda; 11 = Xitsonga; 12 = Sign language; 13 = Other. *Write the appropriate code in the boxes. If no other language, write 00 in the second box.*
					First / Second
					First / Second
					First / Second
					First / Second
					First / Second
					First / Second
					First / Second
					First / Second
					First / Second
					First / Second

A01

SECTION B: MIGRATION - ASK OF EVERYONE LISTED ON THE FLAP

P-07 PROVINCE OF BIRTH	P-08 COUNTRY OF BIRTH	P-08a YEAR MOVED TO SOUTH AFRICA	P-09 SOUTH AFRICAN CITIZENSHIP	P-10 USUAL RESIDENCE	P-10a PROVINCE OF USUAL RESIDENCE	P-10b MUNICIPALITY/ MAGISTERIAL DISTRICT OF USUAL RESIDENCE
In which province was *(name)* **born?** 01 = Western Cape 02 = Eastern Cape 03 = Northern Cape 04 = Free State 05 = Kwa-Zulu Natal 06 = North West 07 = Gauteng 08 = Mpumalanga 09 = Limpopo 10 = Outside South Africa 11 = Do not know *Write the appropriate code in the boxes.* ***If 01-09 or 11, Go to P-09***	**In which country was** *(name)* **born?** *Use CAPITAL LETTERS only* *Examples: NEWZEALAND, BOTSWANA, SIERRALEONE*	**In which year did** *(name)* **move to South Africa?** *If moved more than once into South Africa, please indicate the year of last move.* **Example** 1 9 9 8	**Is** *(name)* **a South African citizen?** 1 = Yes 2 = No *Mark the appropriate circle with an X.*	**Does** *(name)* **usually live in this household for at least four nights a week and has done so for the last six months? OR intends to live in this household for at least four nights a week for the next six months?** 1 = Yes 2 = No *Mark the appropriate circle with an X.* ***If 1, Go to P-11***	**In which province does** *(name)* **usually live?** 01 = Western Cape 02 = Eastern Cape 03 = Northern Cape 04 = Free State 05 = Kwa-Zulu Natal 06 = North West 07 = Gauteng 08 = Mpumalanga 09 = Limpopo 10 = Outside South Africa 11 = Do not know *Write the appropriate code in the boxes.* ***If 10, Go to P-11***	**In which municipality or magisterial district does** *(name)* **usually live?** *Use CAPITAL LETTERS only* **Example** J O B U R G M E T R O
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		
			1 Yes 2 No	1 Yes 2 No		

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A02

SECTION B: MIGRATION (Continued)

P•10c CITY/TOWN OF USUAL RESIDENCE	P•11 SINCE 2001	P•11a MONTH AND YEAR MOVED	P•11b PROVINCE OF PREVIOUS RESIDENCE	P•11c MUNICIPALITY/ MAGISTERIAL DISTRICT OF PREVIOUS RESIDENCE	P•11d CITY/TOWN OF PREVIOUS RESIDENCE
In which city/town does *(name)* usually live or what is the nearest city/town? *Use CAPITAL LETTERS only*	**Has *(name)* been living in this place since October 2001?** 1 = Yes 2 = No 3 = Born after October 2001 but never moved 4 = Born after October 2001 and moved *Write the appropriate code in the box.* ***If 1 or 3, Go to P-12***	**When did *(name)* move to this place?** *Write the month and year in the appropriate boxes.* **Example** 0 4 2 0 0 2	**In which province did *(name)* live before moving to this place?** 01 = Western Cape 02 = Eastern Cape 03 = Northern Cape 04 = Free State 05 = Kwa-Zulu Natal 06 = North West 07 = Gauteng 08 = Mpumalanga 09 = Limpopo 10 = Outside South Africa 11 = Do not know *Write the appropriate code in the boxes.* ***If 10, Go to P-12***	**In which municipality or magisterial district did *(name)* live before moving to this place?** *Use CAPITAL LETTERS only* **Example** J O B U R G M E T R O	**In which city/town did *(name)* live before or what was the nearest city/town?** *Use CAPITAL LETTERS only* **Example** J O H A N N E S B U R G

A03

SECTION C: GENERAL HEALTH AND FUNCTIONING - ASK OF EVERYONE LISTED ON THE FLAP

SECTION D: PARENTAL SURVIVAL AND INCOME - ASK OF EVERYONE LISTED ON THE FLAP

P-12 HEALTH AND FUNCTIONING	P-13 ASSISTIVE DEVICES AND MEDICATION	P-14 MOTHER ALIVE	P-14a MOTHER PERSON NUMBER	P-15 FATHER ALIVE
Does *(name)* **have difficulty in the following?** A = Seeing even when using eye glasses? B = Hearing even when using a hearing aid? C = Communicating in his/her language (i.e. understanding others or being understood by others)? D = Walking or climbing stairs? E = Remembering or concentrating? F = With self-care such as washing all over, dressing or feeding? 1 = No difficulty 2 = Some difficulty 3 = A lot of difficulty 4 = Cannot do at all 5 = Do not know 6 = Cannot yet be determined *Write the appropriate code in the box.*	**Does** *(name)* **use any of the following?** A = Eye glasses B = Hearing aid C = Walking stick or frame D = A wheelchair E = Chronic medication 1 = Yes 2 = No 3 = Do not know *Write the appropriate code in the box.*	**Is** *(name's)* **own biological mother still alive?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.* *If 2-3, Go to P-15*	**Who in this household is** *(name's)* **biological mother?** *If the person's mother does not reside in the household (not listed on the flap), write 98.* ***Note:*** *Refer to person number on flap e.g. 02*	**Is** *(name's)* **own biological father still alive?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.* *If 2-3, Go to P-16*
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
Seeing (A) / Walking / Climbing (D) Hearing (B) / Remembering / Concentrating (E) Communicating (C) / Self-care (F)	Glasses (A) / Wheelchair (D) Hearing aid (B) / Chronic medication (E) Walking stick / frame (C)	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know

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A04

SECTION D: PARENTAL SURVIVAL AND INCOME (Continued)

P-15a FATHER PERSON NUMBER

Who in this household is *(name's)* biological father?

If the person's father does not reside in the household (not listed on the flap), write 98.

***Note:** Refer to person number on flap e.g. 02*

P-16 INCOME CATEGORY

What is the income category that best describes the gross monthly or annual income of *(name)* before deductions and including all sources of income?

Monthly	Annual
01 = No income	No income
02 = R1 - R400	R1 - R4 800
03 = R401 - R800	R4 801 – R9 600
04 = R801 – R1 600	R9 601 – R19 200
05 = R1 601 – R3 200	R19 201 – R38 400
06 = R3 201 – R6 400	R38 401 – R76 800
07 = R6 401 – R12 800	R76 801 – R153 600
08 = R12 801 – R25 600	R153 601 – R307 200
09 = R25 601 – R51 200	R307 201 – R614 400
10 = R51 201 – R102 400	R614 401 – R1 228 800
11 = R102 401 – R204 800	R1 228 801 – R2 457 600
12 = R204 801 or more	R2 457 601 or more

*Gross income should include **all sources of income** e.g. Social grants, UIF, remittances, rentals, investments, sales or products, services, etc.*

SECTION E: EDUCATION - ASK OF ALL PERSONS AGED 5 YEARS AND OLDER LISTED ON THE FLAP

P-17 SCHOOL ATTENDANCE

Does *(name)* presently attend an educational institution?

1 = Yes
2 = No
3 = Do not know

Mark the appropriate circle with an X.

Attendance includes all part-time and full-time studies, whether in person or as a distance learner.

If 2-3, Go to P-20

P-18 EDUCATIONAL INSTITUTION

Which of the following educational institutions does *(name)* attend?

1 = Pre-school (including day care, crèche, Grade R and Pre-Grade R in an ECD centre)
2 = Ordinary school (including Grade R learners who attend a formal school, Grade 1–12 learners & learners in special class)
3 = Special school
4 = Further Education and Training College (FET)
5 = Other College
6 = Higher Educational Institution (University/University of Technology)
7 = Adult Basic Education and Training Centre (ABET Centre)
8 = Literacy classes (e.g. Kha Ri Gude, SANLI)
9 = Home based education/home schooling

Write the appropriate code in the box.

P-19 PUBLIC OR PRIVATE

Is the institution that *(name)* is attending public or private?

1 = Public (Government)
2 = Private (Independent)
3 = Do not know

Mark the appropriate circle with an X.

P-15a	P-16	P-17	P-18	P-19
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know
		1 Yes 2 No 3 Do not know		1 Public 2 Private 3 Do not know

A05

SECTION E: EDUCATION (Continued)

P-20 LEVEL OF EDUCATION

What is the highest level of education that *(name)* has completed?

98 = No schooling
00 = Grade 0
01 = Grade 1/Sub A
02 = Grade 2/Sub B
03 = Grade 3/Std 1/ABET 1 (Kha Ri Gude, SANLI)
04 = Grade 4/Std 2
05 = Grade 5/Std 3 / ABET 2
06 = Grade 6/Std 4
07 = Grade 7/Std 5 / ABET 3

If 98 or 00-07, Go to P-22

08 = Grade 8/Std 6 / Form 1
09 = Grade 9/Std 7/Form 2/ ABET 4
10 = Grade 10/Std 8/Form 3
11 = Grade 11/Std 9/Form 4
12 = Grade 12/Std 10 /Form 5

If 08-12, Go to P-23

13 = NTC I/N1/ NIC/(V) Level 2
14 = NTC II/N2/ NIC/(V) Level 3
15 = NTCIII/N3/NIC/(V) Level 4
16 = N4/NTC 4
17 = N5/NTC 5
18 = N6/NTC 6
19 = Certificate with less than Grade 12 /Std 10
20 = Diploma with less than Grade 12/Std 10
21 = Certificate with Grade 12/Std 10
22 = Diploma with Grade 12/Std 10
23 = Higher Diploma
24 = Post Higher Diploma (Masters, Doctoral Diploma)
25 = Bachelors degree
26 = Bachelors degree and Post graduate diploma
27 = Honours degree
28 = Higher degree (Masters/PhD)
29 = Other

If 13-28, Go to P-21

If 29, Go to P-22

READ OUT: Diploma or certificate should have been at least six months study duration full-time (or equivalent).

Write the appropriate code in the boxes.

P-21 FIELD OF EDUCATION

In which field is *(name's)* highest post-school qualification?

UNIVERSITY/TECHNIKON/COLLEGE

01 = Agriculture or Renewable Natural Resources
02 = Architecture or Environmental Design
03 = Arts, Visual or Performing
04 = Business, Commerce or Management Sciences
05 = Communication
06 = Computer Sciences
07 = Education, Training or Development
08 = Engineering or Engineering Technology
09 = Health Care or Health Sciences
10 = Home Economics
11 = Industrial Arts, Trades or Technology
12 = Languages, Linguistics or Literature
13 = Law
14 = Libraries or Museums
15 = Life Sciences or Physical Sciences
16 = Mathematical Sciences
17 = Military Sciences
18 = Philosophy, Religion or Theology
19 = Physical Education or Leisure
20 = Psychology
21 = Public Administration or Social Services
22 = Social Sciences or Social Studies
23 = Other

FURTHER EDUCATION AND TRAINING (FET)

24 = Management
25 = Marketing
26 = Information Technology and Computer Science
27 = Finance, Economics and Accounting
28 = Office Administration
29 = Electrical Infrastructure Construction
30 = Civil Engineering and Building Construction
31 = Engineering
32 = Primary Agriculture
33 = Hospitality
34 = Tourism
35 = Safety in society
36 = Mechatronics
37 = Education and Development
38 = Other

Write the appropriate code in the boxes.

Any response, Go to P-23

X-123456789

A06

SECTION E: EDUCATION (Continued)

P-22 LITERACY

Does *(name)* **have difficulty in doing any of the following?**

A = Writing his/her name
B = Reading (e.g. newspapers, magazines, religious books etc) in any language
C = Filling in a form (e.g. social grants forms)
D = Writing a letter in any language
E = Calculating/working out how much change he/she should receive when buying something
F = Reading road signs

1 = No difficulty
2 = Some difficulty
3 = A lot of difficulty
4 = Unable to do
5 = Do not know

Write the code in the appropriate box.

SECTION F: EMPLOYMENT - ASK OF ALL PERSONS AGED 15 YEARS AND OLDER LISTED ON THE FLAP

P-23 EMPLOYMENT STATUS

(Answer all three questions and then follow the skip instruction below)

In the SEVEN DAYS before 10 October ... **P-23a** **Did** *(name)* **work for a wage, salary, commission or any payment in kind (including paid domestic work), even if it was for only one hour?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*	**In the SEVEN DAYS before 10 October ...** **P-23b** **Did** *(name)* **run or do any kind of business, big or small, for herself/himself or with one or more partners, even if it was for only one hour?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*	**In the SEVEN DAYS before 10 October ...** **P-23c** **Did** *(name)* **help without being paid in any kind of business run by her/his household, even if it was for only one hour?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*

If 1 (Yes) to any of P-23a, P-23b or P-23c, Go to P-29a

P-22	P-22	P-23a	P-23b	P-23c
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
Writing his/her name (A) Reading (B) Filling a form (C)	Writing a letter (D) Calculating (E) Reading road signs (F)	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know

SECTION F: EMPLOYMENT (Continued)

P-24 TEMPORARY ABSENCE FROM WORK	P-25 LOOKING FOR WORK	P-26 LIKED TO WORK	P-27 REASONS FOR NOT WORKING	P-28 AVAILABLE TO WORK
Even though *(name)* **did not do any work for pay, profit or did not help without pay in a household business in the SEVEN DAYS before 10 October, did he/she have a paid job or business that he/she would definitely return to?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*	**In the four weeks before 10 October was** *(name)* **looking for any kind of job or trying to start any kind of business?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*	**Would** *(name)* **have liked to work in the SEVEN DAYS before 10 October?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*	**What was the main reason for not trying to find work or starting a business in the last four weeks before 10 October?** 01 = Awaiting the season for work 02 = Waiting to be recalled to former job 03 = Health reasons 04 = Pregnancy 05 = Disabled or unable to work (handicapped) 06 = Housewife/homemaker (family considerations/child care) 07 = Undergoing training to help find work 08 = No jobs available in the area 09 = Lack of money to pay for transport to look for work 10 = Unable to find work requiring his/her skills 11 = Lost hope of finding any kind of work 12 = No transport available 13 = Scholar or student 14 = Retired 15 = Too old/young to work 16 = Did not want to work 17 = Other *Write the appropriate code in the boxes.*	**If a suitable job had been offered or circumstances had allowed, would** *(name)* **have been able to start work or a business in the SEVEN DAYS before 10 October?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*
If 1, Go to P-29a	***If 1, Go to P-28***	***If 2 or 3, Go to P-32***		***Any response, Go to P-32***
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know
1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know		1 Yes 2 No 3 Do not know

X-123456789

A08

SECTION F: EMPLOYMENT (Continued)

P-29a INDUSTRY	P-29b MAIN GOODS OR SERVICES	P-30a OCCUPATION	P-30b MAIN TASK/DUTY	P-31 TYPE OF SECTOR
What is the name of *(name's)* **place of work/organisation/ company/business?** *Examples: KOMANIHOSPITAL, RAPELEPRIMARYSCHOOL, HARMONYGOLDMINING* *Write OWNHOUSE or NOFIXEDLOCATION, if rslevant* *Use CAPITAL LETTERS only*	**What are the main goods or services produced at** *(name's)* **place of work or its main functions?** *Examples: REALESTATE, CONSTRUCTION, CARREPAIRING, HOSPITALITYSERVICES* *For domestic workers, write PRIVATEHOUSEHOLD* *Use CAPITAL LETTERS only*	**What kind of work does** *(name)* **usually do in his/her main job/business?** *Examples: PRIMARYSCHOOLTEACHER, BUSINESSOWNER, OFFICECLEANER* *Use CAPITAL LETTERS only*	**What is** *(name's)* **main task or duty in this work?** *Examples: TEACHINGCHILDREN, SELLINGFRUIT, BOOKKEEPING, FEEDINGCATTLE* *Use CAPITAL LETTERS only*	**Is** *(name's)* **place of work .....?** 1 = In the formal sector 2 = In the informal sector 3 = Private household 4 = Do not know *Write the appropriate code in the box.*

A09

SECTION G: FERTILITY - ASK OF WOMEN AGED 12-50 YEARS LISTED ON THE FLAP

P-32 CHILDREN EVER BORN	P-33 AGE AT FIRST BIRTH	P-34 TOTAL CHILDREN EVER BORN	P-35 TOTAL SURVIVING AND LIVING IN THE HOUSEHOLD	P-36 TOTAL SURVIVING AND LIVING ELSEWHERE	P-37 TOTAL CHILDREN NO LONGER ALIVE	P-38 LAST CHILD BORN	P-39 SEX OF LAST CHILD BORN	P-40 LAST CHILD BORN ALIVE	P-41 DATE OF DEATH OF LAST CHILD BORN
Has *(name)* ever given birth to a live child, even if the child died soon after birth? 1 = Yes 2 = No 3 = Do not know	**At what age did *(name)* have her first child born?**	**How many children has *(name)* ever had that were born alive?**	**How many of *(name's)* children are still alive and living with her in this household, including grown-ups?**	**How many of *(name's)* children are still alive and living elsewhere, including grown-ups?**	**How many of *(name's)* children are no longer alive?**	**When was *(name's)* last child born, even if the child died soon after birth?**	**Is *(name's)* last child born male or female?** 1 = Male 2 = Female 3 = Do not know	**Is *(name's)* last child born still alive?** 1 = Yes 2 = No 3 = Do not know	**When did *(name's)* last child born die?**
Mark the appropriate circle with an X. ***If 2 or 3, Go to H-01***	**Example** 2 5	**Example** Boys 0 2 Girls 0 2 Total 0 4 *Write the correct number in the boxes below*	**Example** Boys 0 2 Girls 0 1 Total 0 3 *Write the correct number in the boxes below*	**Example** Boys 0 0 Girls 0 0 Total 0 0 *Write the correct number in the boxes below*	**Example** Boys 0 0 Girls 0 1 Total 0 1 *Write the correct number in the boxes below*	**Example** 1 9 0 4 2 0 0 5	*Mark the appropriate circle with an X.*	*Mark the appropriate circle with an X.* ***If 1 or 3, Go to H-01***	**Example** 1 0 0 3 2 0 0 7
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y
1 Yes 2 No 3 Do not know		Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total	D D M M Y Y Y Y	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	D D M M Y Y Y Y

A10

SECTION H: HOUSING, HOUSEHOLD GOODS AND SERVICES AND AGRICULTURAL ACTIVITIES - ASK OF EVERY HOUSEHOLD

H-01 TYPE OF LIVING QUARTERS

What is the type of these living quarters?

01 = Housing unit
02 = Converted Hostel (e.g. family unit)
03 = Residential Hotel
04 = Home for the aged
05 = Other

Write the appropriate code in the boxes.

If 03-05, Go to H-07

H-02 TYPE OF MAIN DWELLING

Which of the following best describes the MAIN dwelling and OTHER dwelling(s) that this household occupies?

01 = House or brick/concrete block structure on a separate stand or yard or on a farm
02 = Traditional dwelling/hut/structure made of traditional materials
03 = Flat or apartment in a block of flats
04 = Cluster house in complex
05 = Townhouse (semi-detached house in a complex)
06 = Semi-detached house
07 = House/flat/room in backyard
08 = Informal dwelling (shack in backyard)
09 = Informal dwelling (shack not in backyard, e.g. in an informal/squatter settlement or on a farm)
10 = Room/flatlet on a property or a larger dwelling/servants' quarters/ granny flat
11 = Caravan/tent
12 = Other

Main dwelling	Other dwelling

Write the appropriate code in the boxes.

H-02a CONSTRUCTION MATERIAL

What is the main material used for the construction of the roof and wall of the MAIN dwelling?

01 = Brick
02 = Cement block/Concrete
03 = Corrugated iron/zinc
04 = Wood
05 = Plastic
06 = Cardboard
07 = Mud and cement mix
08 = Wattle and daub
09 = Tile
10 = Mud
11 = Thatch/Grass
12 = Asbestos
13 = Other

ROOF	WALL

Write the appropriate code in the boxes.

H-03 ROOMS

How many rooms are there in the MAIN dwelling of this household?

Dining rooms	
Living rooms	
Dining/Living room	
Bedrooms	
Study Rooms	
One room with multiple uses	
Other rooms	
Total Rooms	

Write the correct number of rooms in the boxes.

Exclude bathrooms and kitchen
Include garages if some members of the household are living in them

H-04 TENURE STATUS

What is the tenure status of this dwelling?

1 = Rented
2 = Owned but not yet paid off
3 = Occupied rent-free
4 = Owned and fully paid off
5 = Other

Write the appropriate code in the box.

*Refers to the MAIN dwelling structure only and **NOT** to the land that it is situated on.*

H-05 ESTIMATED VALUE OF PROPERTY

What would you estimate the market value or municipal valuation of this property to be?

1 = Less than R50 000
2 = R50 001 – R100 000
3 = R100 001 – R200 000
4 = R200 001 – R400 000
5 = R400 001 – R800 000
6 = R800 001 – R1 600 000
7 = R1 600 001 – R3 200 000
8 = More than R3 200 001
9 = Do not know

Write the appropriate code in the box.

H-06 AGE OF THE PROPERTY

What is the age of this dwelling?

01 = Less than one year
02 = 1 - 5 years
03 = 6 - 10 years
04 = 11 - 20 years
05 = 21 - 30 years
06 = 31 - 40 years
07 = 41 - 50 years
08 = 51 - 60 years
09 = 61 years or older
10 = Do not know

Write the appropriate code in the boxes.

The age of the dwelling refers to when the building was completed, not the time of any later remodelling, additions or conversions. If the actual age is not known, give the best estimate.

H-07 ACCESS TO PIPED WATER

In which way does this household mainly get piped water for household use?

1 = Piped (tap) water inside the dwelling
2 = Piped (tap) water inside the yard
3 = Piped (tap) water on community stand: distance less than 200m from dwelling
4 = Piped (tap) water on community stand: distance between 200m and 500m from dwelling
5 = Piped (tap) water on community stand: distance between 500m and 1000m (1 km) from dwelling
6 = Piped (tap) water on community stand: distance greater than 1000m (1 km) from dwelling
7 = No access to piped water

Write the appropriate code in the box.

H-08 SOURCE OF WATER

What is this household's MAIN source of WATER for household use?

1 = Regional/local water scheme (operated by municipality or other water services provider)
2 = Borehole
3 = Spring
4 = Rain water tank
5 = Dam/pool/stagnant water
6 = River/stream
7 = Water vendor
8 = Water tanker
9 = Other

Write the appropriate code in the box.

If 2-9, Go to H-10

A11

SECTION H: HOUSING, HOUSEHOLD GOODS AND SERVICES AND AGRICULTURE ACTIVITIES (Continued)

H-09 RELIABILITY OF WATER SUPPLY

In the last 12 months, has this household had any interruptions in piped water supply?

1 = Yes
2 = No

If 2, Go to H-10

Mark the appropriate circle with an X.

H-09a RELIABILITY OF WATER SUPPLY

Did any specific interruption(s) in piped water supply last longer than two days ?

1 = Yes
2 = No

If 2, Go to H-10

Mark the appropriate circle with an X.

H-09b ALTERNATIVE WATER SOURCE

What alternative water source did the household use during water supply interruption?

1 = Borehole
2 = Spring
3 = Rain water tank
4 = Dam/pool/stagnant water
5 = River/stream
6 = Water vendor
7 = Water tanker
8 = Other
0 = None

Write the appropriate code in the box.

H-10 TOILET FACILITIES

What is the MAIN type of TOILET facility used by this household?

1 = Flush toilet (connected to sewerage system)
2 = Flush toilet (with septic tank)
3 = Chemical toilet
4 = Pit toilet with ventilation (VIP)
5 = Pit toilet without ventilation
6 = Bucket toilet
7 = Other
0 = None

Write the appropriate code in the box.

H-11 ENERGY/FUEL

What type of energy/fuel does this household MAINLY use for cooking, heating and lighting?

COOKING
HEATING
LIGHTING

1 = Electricity
2 = Gas
3 = Paraffin
4 = Wood
5 = Coal
6 = Candles
7 = Animal Dung
8 = Solar
9 = Other
0 = None

Write the appropriate code in the box.

Note

- *Wood (4), coal (5) and animal dung (7) cannot be used for lighting*
- *Candles (6) cannot be used for heating or cooking*

H-12 REFUSE DISPOSAL

How is the refuse or rubbish from this household MAINLY disposed of?

1 = Removed by local authority/private company at least once a week
2 = Removed by local authority/private company less often
3 = Communal refuse dump
4 = Own refuse dump
5 = No rubbish disposal
6 = Other

Write the appropriate code in the box.

H-13 HOUSEHOLD GOODS AND SERVICES

Does this household own any of the following in working order?

1 = Yes
2 = No

Write the appropriate code in the box.

Refrigerator		Motorcar	
Electric/gas stove		Television	
Vacuum cleaner		Radio	
Washing machine		Landline/Telephone	
Computer		Cell phone	
Satellite television		Mail Post box/bag	
DVD Player		Mail delivery at home	

H-13a ACCESS TO INTERNET

How does this household MAINLY access internet?

1 = From home
2 = From Cell phone
3 = From work
4 = From elsewhere
5 = No access to internet

Write the appropriate code in the box.

H-14 AGRICULTURAL ACTIVITIES

What kind of agricultural activity is the household involved in? (More than 1 activity can be chosen)

1 = Livestock production (cattle, goats, sheep, pigs, etc)
2 = Poultry production (chicken, ducks, geese, guinea fowl, ostrich, etc)
3 = Vegetable production
4 = Production of other crops (grains, fruits, etc)
5 = Fodder grazing/pasture/grass for animals
6 = Other
0 = None

Mark the appropriate circle with an X.

If only 2-6, Go to H-14b. If 0, Go to M-00

H-14a LIVESTOCK

How many of the following does the household own?

	0	1 - 10	11 - 100	+ 100
1 = Cattle				
2 = Sheep				
3 = Goats				
4 = Pigs				
5 = Other				

Mark the appropriate circle with an X.

H-14b PLACE OF AGRICULTURAL ACTIVITIES

Where does this household operate its agricultural activities?

1 = Farm land
2 = Backyard or school
3 = Communal or tribal land
4 = Other

Mark the appropriate circle with an X.

X-123456789

A12

SECTION I: MORTALITY IN THE LAST 12 MONTHS

M-00 DEATH OCCURRED

Has any member of this household passed away in the last 12 months (between 10 October 2010 and 9 October 2011)?

1 Yes
2 No
3 Do not know

Mark the appropriate circle with an X.

If 2 or 3, Questionnaire completed

M-00a NUMBER OF DEATHS

How many members of the household passed away in the last 12 months (between 10 October 2010 and 9 October 2011)?

ASK ONLY ABOUT DECEASED WOMEN THAT WERE AGED 12 - 50 AT THE TIME OF DEATH

M-01 NAME OF DECEASED	**M-02** MONTH AND YEAR OF DEATH	**M-03** SEX OF THE DECEASED	**M-04** AGE OF THE DECEASED	**M-05** NATURAL OR UNNATURAL DEATH	**M-06** PREGNANT AT TIME OF DEATH	**M-07** DEATH DURING BIRTH	**M-08** POSTNATAL DEATH
What was the first name of *(the deceased)***?** *Use CAPITAL LETTERS only*	**What was the MONTH and the YEAR of** *(the deceased's)* **death?** *Write the month and year in the appropriate boxes.*	**Was** *(the deceased)* **male or female?** 1 = Male 2 = Female *Mark the appropriate circle with an X.*	**What was** *(the deceased's)* **age in completed years at the time of death?** *Write the age in the boxes. If age is less than 1 year, write 000.*	**Was the death due to a natural or an unnatural cause?** 1 = Natural (e.g. illness) 2 = Unnatural (e.g. accident, assault) 3 = Do not know *Mark the appropriate circle with an X.*	**Did** *(the deceased)* **die while pregnant?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*	**Did** *(the deceased)* **die while giving birth?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*	**Did** *(the deceased)* **die within 6 weeks after delivery?** 1 = Yes 2 = No 3 = Do not know *Mark the appropriate circle with an X.*
					If 1 to M-06 or M-07, Questionnaire completed		
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know
	M M Y Y Y Y	1 Male 2 Female		1 Natural 2 Unnatural 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know	1 Yes 2 No 3 Do not know

If more than 8 deaths in the household, use a second questionnaire. Write the barcode of the 1st questionnaire below:

THANK YOU FOR YOUR CO-OPERATION

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