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TRANSITION TO MOTHERHOOD AMONG WOMEN IN NAMIBIA: A SURVIVAL MODEL

Mwandingi, S. L. and Pazvakawambwa, L.
University of Namibia, Department of Statistics and Population Studies

ABSTRACT

The transition to motherhood is a highly challenging phase in a woman's life as she prepares, physically and emotionally, for the new role of becoming a mother. It does not only indicate a biological change in a woman, but also determine future roles and responsibilities a woman is likely to face after giving birth to their first child. Early age at first birth can have serious consequences such as lower levels of socio-economic and educational empowerment, poor shelter under which children are raised, reduced chances to opportunities available to them. In Namibia few studies have focused on age at first birth among women. The objective of this study was to investigate factors associated with the transition to motherhood among women in Namibia.

Data from the 2013 Namibian Demographic and Health Survey (NDHS) was used. Univariate statistical analysis included frequency distributions and descriptive statistics. For multivariate analysis, Kaplan Meir Curves and the Cox Proportional hazards model were used to analyze survival time and to investigate the relationship between age at first birth and covariates. A total of 6453 women were analyzed.

Cox regression results indicated an increase in risk in early first birth among women living in Kavango region (HR=1.17, p=0.03,) and Khomas region (HR=1.18, p=0.03,) compared to their counterparts in the Otjozondjupa region. Women in the middle wealth quintile (HR=1.09, p=0.03) were more likely to have early first births compared to those in the rich wealth quintile. Herero speaking women (HR=0.75, p=0.02) and Kwangali (HR=0.73, p=0.01,) were significantly less likely to have early first birth compared the San speaking women.

The findings of this study indicated that transition to motherhood in Namibia is associated with the region, wealth index and cultural factors. These factors should be taken into consideration by our government and private sector when it come formulation of new strategies and policies to reduce teenage pregnancy in Namibia.

KEYWORDS: transition-to-motherhood, Kaplan Meir curves, Cox Proportional Hazards Model, Namibia

INTRODUCTION

Motherhood is automatically switched on by pregnancy, the birth of a baby; the subsequent lifelong obligations and kinship that come with the package (Akujobi 2011;David, 2012; Mathews et al.,

2016).The transition to motherhood is a highly challenging phase in a woman's life as she prepares, physically and emotionally, for the new role in her life; becoming a mother (Mercer, 2004; Darvill, Skirton, & Farrand, 2010).According to a 2012 World Health Organization (WHO) fact sheet on adolescent pregnancy, it is estimated that 16 million adolescent girls give birth every year most in low and middle-income countries.

The age at which a girl has their first child is very important as it also influences the number of children she will have in her lifetime. There are challenges that first time mothers face during pregnancy and after conception. According to (David, 2012) many women, especially adults regard motherhood in a positive light, while on the other hand; adolescents my perceive it as a burden and as demanding and sometimes unacceptable.

Globally, around 16 million teenage women give birth each year, accounting for around 11% of all births (WHO, 2014). Over 90% of these deliveries occur in low- and middle-income countries and more than half occur in seven countries: Bangladesh, Brazil, the Democratic Republic of Congo, Ethiopia, India, Nigeria and the United States. (Cook & Cameron. 2015

In recent years there has been a considerable interest in the potential health problems and social disadvantages faced by young women who become mothers during the phase of adolescence. The high incidence of adolescent of mothers in rural areas is a matter of great concern in Namibia, particularly in view of the negative impact of this phenomenon on the health of both the adolescent and the infant (David, 2012). If left unchecked, such rates and their underlying patterns of sexual behavior would compromise the country's socioeconomic progress and its efforts to contain the spread of HIV infection (Magazi, 2011).

Few studies on motherhood were done in Namibia. A study done by USAID on teenage pregnancy in Kavango region revealed that Kavango region topped the nation in the incidence of teenage pregnancy in 2011, with an estimated rate of 34% compared to other regions in Namibia. This rate is over twice the national average (15%) and three times the rates in some of the neighboring regions such as Ohangwena, Omusati, or Oshana. These earlier pregnancy statistics were recently corroborated by the ANC sero-prevalence survey, which indicated that, of all women tested during 2010 surveillance, 18% were less than 20 years old (Magazi, 2011).

Motherhood at a very young age entails complications during pregnancy and delivery and a risk of maternal death that is much greater than average. The children of young mothers have higher levels of morbidity and mortality. Early child-bearing continues to be an impediment to improvements in the educational, economic and social status of women in all parts of the world (Chireau, 2010).

The increased incidence of teenage motherhood denies girls the opportunity to complete their education and acquire the skills that are critical for gainful employment in the labour market and in decision making about key issues of development (Were, 2007; Mwaba, 2000). Teenage mothers experience additional challenges because they not only need to adapt to the role of being a new

mother but also continue to develop through the transitional stages of adolescence (DeVito, 2010; James et al., 2012).

Motherhood is an important issue in terms of progress toward the achievement of the Millennium Development Goals, firstly because it occurs most often among the daughters of poor families and therefore tends to perpetuate poverty and the lack of opportunities from generation to generation, together with risks of infant malnutrition. Secondly, it leads to increased incidence of infant morbidity and mortality, as well as complications during birth and the postpartum period. Thirdly, it is closely linked to early school dropouts among teenage girls. Teenage mothers and their babies show higher than average risks of unsatisfactory progress during pregnancy, difficulties at the birth, and poor health in subsequent years (Fraser et al, 1995, Strobino 1992, Cunnington 2001; Chireu, 2010).Women whose first child was born when they were teenagers were consistently worse off than women who started a family in their twenties (Berthoud & Robson,2001).Age at first birth has direct effect on fertility; early initiation of childbearing lengthens the reproductive period and subsequently increases fertility level of a country (Rabbi & Kabir,2013).Whilst motherhood can be a positive experience for some young women, in the UK it is often associated with poor social and health outcomes for mother and child(Sinead et al., 2015). Young mothers were less likely to complete high school, less likely to participate in the labor force, more likely to have lower earnings, and at higher risk of welfare dependency than women who did not bear children as teenagers (Narita, Dolores, & Diaz, 2016).

Sub-Saharan Africa had the highest prevalence of teenage pregnancy in the world in 2013 (United Nations Population Fund, 2013). Births to teenage mothers account for more than half of all the births in this region: an estimated 101 births per 1000 women aged 15 to 19 only a few number of women have had their first child at older ages from 40 onwards. The majority of countries with teenage pregnancy levels above 30% occur in sub-Saharan Africa (Loaiza & Liang, 2013). Therefore, government and non-governmental organizations (NGOs) have attempted to address this via policies and other initiatives (Mkwananzi &Odimegwu,2015). In 2013, birth rates ranged from 150 or higher to less than 50 births per 1000 women of ages 15 to 19 in the sub-continent, with Central Africa displaying the highest levels and Southern Africa having the lowest (Clifton & Hervish, 2013).

There may be common unobservable factors that influence both the probability of giving birth as a teenager and other socio-economic outcomes. (Walker, 2012).

Bloom and Hall (1997), Were (2007) and Mwaba (2000) have shown that an increased incidence of teenage motherhood, childbirth, abortions, and school dropout rates are significantly higher in the rural settlements than in urban settlements. Research has indicated that teenage pregnancy and motherhood correlate with the socioeconomic status of, or social deprivation in, the area of residence and that where a woman lives may be related to her chance of conceiving before she turns twenty (Diamond et al., 1999). Recent studies on teenage pregnancy (Molosiwa & Moswela, 2012;

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Nwogwugwu, 2013; Nyakubega, 2010).have identified education and socio-economic status as consistent determinants of teenage pregnancy in sub-Saharan African countries. Other studies on teenage pregnancy in Nigeria, Kenya, and Lesotho have shown household size and parents' marital status as significant predictors of motherhood (Ifeoma, 2008; Ugoji, 2011).

Adolescents with stronger academic aspirations and higher achievement profiles are less likely to have had sexual intercourse during mid-adolescence compared to their lesser achieving peers. Similar patterns have emerged in relation to pregnancy and child birth. In New Zealand; women who experienced pregnancy as a teenager were approximately ten times more likely than their non-pregnant peers to have left school early (J.L. Smith et al. 2012). In various studies research further noted that that education delays childbearing and decreases years dedicated to childbearing until women have their qualifications (Zuberi, 2005). By the time they decide to get married they will be much older, so motherhood and marriage is delayed. The increase in Brazilian teenage pregnancy was largely due to the increase in the proportion of sexually active teenagers.

Some parents are reluctant to make sex education and contraceptives available to their teenagers, as they are afraid that their teenagers might interpret this as permission to engage in early sexual activities. They further pointed out that teenagers are reluctant to visit clinics to obtain contraceptives and thus do not make use of available health service (Mothiba& Maputle, 2012).Studying the factors that influence transition to motherhood among women in Namibia can guide policy on reducing early child birth in Namibia.

Statistical analysis approaches

Survival models have been applied to establish the factors influencing the transition to motherhood, which include multiple regression (Netshivhela, 2015; Kleinbaum, 2006).As ordinary multiple regression models have rigid assumptions which are often difficult to meet.A Cox Proportional Hazards model assesses the hazard of an event occurring at time *t* given a person has not experienced that event up to time *t*. The Cox PH model is semi-parametric in that it has both a parametric and a nonparametric component. The time-dependent hazard rate is represented by λ (t). The basic Cox PH model indicates that the hazard at time t for an individual *i* exposed to X at time *t* is:

$$\lambda_i(t) = \lambda_0(t)e^{(\beta X_i(t))}$$

with $\lambda_0(t)$ representing the unexposed or base-case hazard rate. In this model, neither$\lambda_0(t)$, nor $\lambda_i(t)$ need to be specified, as one is only concerned whether and how much the hazard increases at time *t* with *X*. This increase in risk over baseline is represented as the hazard ratio, $\lambda_i(t)/\lambda_0(t)$, and can be calculated by transforming the above equation to:

$$\frac{\lambda_i(t)}{\lambda_0(t)} = e^{(\beta X_i(t))}$$

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The Cox Proportional hazards model assumptions are that the size of the effect of the exposure and other covariates on the hazard (i.e., β and all θ terms) are constant over the study period and not functions of X or t; and that the exposure and other covariates contribute linearly to the natural log of the hazard ratio.The Kaplan Meier (KM) procedure is a method of estimating time-to-event models in the presence of censored cases. (Kleinbaum, 2006). The KM formula

$$S\big(t(j)\big) = S\big(t(j-1)\big).P(T > t(j)|T \geq t(j))$$

gives the probability of surviving past the previous failure time *t(j−1)*, multiplied by the conditional probability of surviving past time *t(j)*, given survival to at least time *t(j)*.

General formula:

$$\hat{S}(t(j)) = \hat{S}(t(j-1)) \times \hat{P}r(T > t(j)|T \geq t(j)).$$

The objectives of the study were to estimate age at first motherhood; to model the factors influencing transition to motherhood among women; and to recommend strategies for delaying the onset of motherhood among girls.

METHODS

The quantitative secondary data was obtained from the Namibia Demographic and Health Survey (NDHS) 2013. The NDHS is conducted as a periodic update of the demographic and health situation in Namibia. NDHS 2013 is the fourth comprehensive national level population and health survey conducted in Namibia as part of the global Demographic and Health Surveys (DHS) Program (NDHS Report, 2013).The target population for this study was women who were in the reproductive age group 15-49 in Namibia who had ever given birth (n=6453).The dependent variable of interest for this study was the "Age at first birth". The independent variables were age, region, type of place of residence, educational level, sex of household head, religion, main language spoken in home (a proxy for cultural factors), social economic status, contraceptive use and the alcohol consumption. Descriptive statistics in the form of charts, graphs and tables were used to profile the background characteristics of women. The Pearson's Chi-Square test was used to determine the association between a set of explanatory variables and age at first birth for categorical variables. Kaplan Meir survival curves were plotted to show differentials in transition to motherhood by various covariates. Cox proportional hazard survival models were used to establish determinants of transition to motherhood among women in Namibia using SPSS Version 24. Hypotheses were tested at 5% level of significance.

RESULTS

The age at first birth ranged from 12 to 42 years of age with a mean of 20.4 years and a standard deviation of 4.0 years. The distribution of respondents by age at first birth in years was 12-19 (47.9%); 20-24(38.6%); 25-29(10.6%); and 30 and above (3.0%). Figure 1 shows the histogram for age-at first birth.

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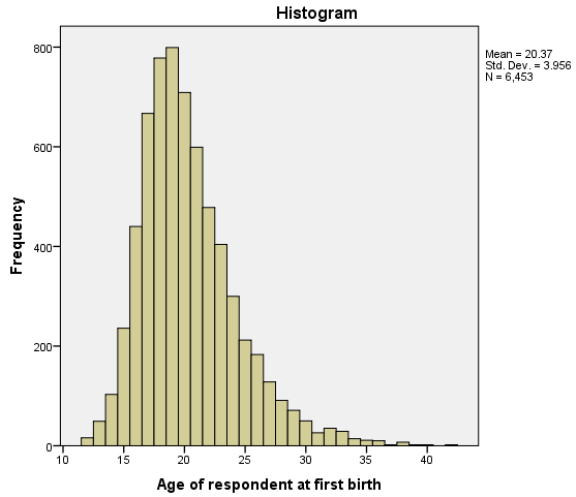

Figure 1. Histogram showing distribution of age at first birth.

Results of Pearson's Chi Square test to assess if there were associations between age at first birth and the independent variables showed that there were significant association between age at first birth and region; types of place of residence; age; sex of household head; contraceptive use religion; wealth index; main language spoken in home; and alcohol consumption at 5% level of significance. The test statistics and the p-values are shown in Table 1.

Table 2 Results of Chi Square tests of association between age at first birth and socio-demographic variables (*p<0.050, **p< 0.01, ***p<0.001).

Variables	Chi Square Value	P-value
Region	638.719***	<0.001
Types of place of residence	37.784***	<0.001
Age in 5 year age group	356.343***	<0.001
Highest educational level	439.642***	<0.001
Sex of household head	57.660***	<0.001
Contraceptive Use	17.286*	0.004
Religion	117.930***	<0.001
Wealth Index	101.481***	<0.001
Main language spoken in home	305.445***	<0.001
Alcohol consumption	22.550***	<0.001

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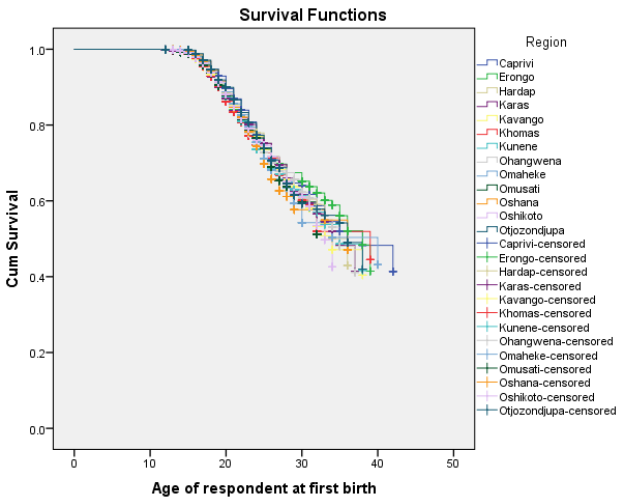
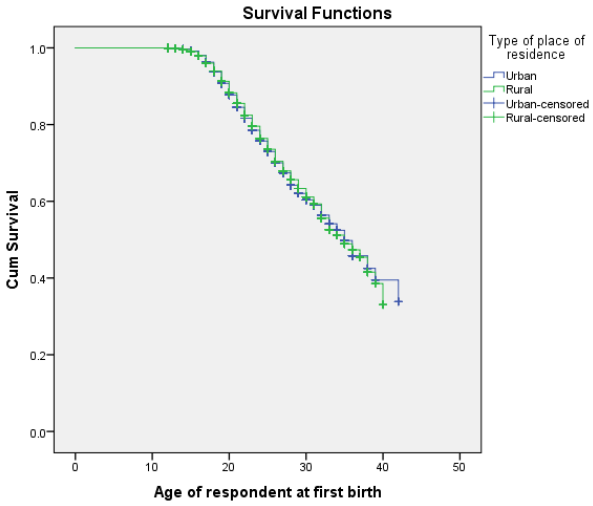
Chi-square tests of association suggest significant associations between region, place of residence, age, highest educational level, sex of household head, contraceptive use, religion, wealth index, main language spoken in home and alcohol consumption.

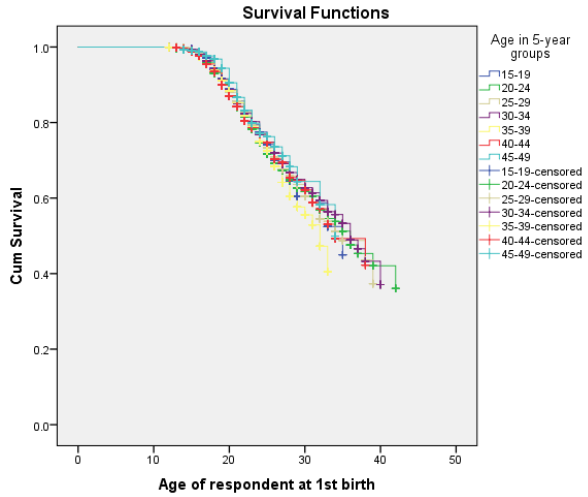
The Kaplan-Meier curves displaying survival probabilitiesare shown in Figure 2.(a-i)



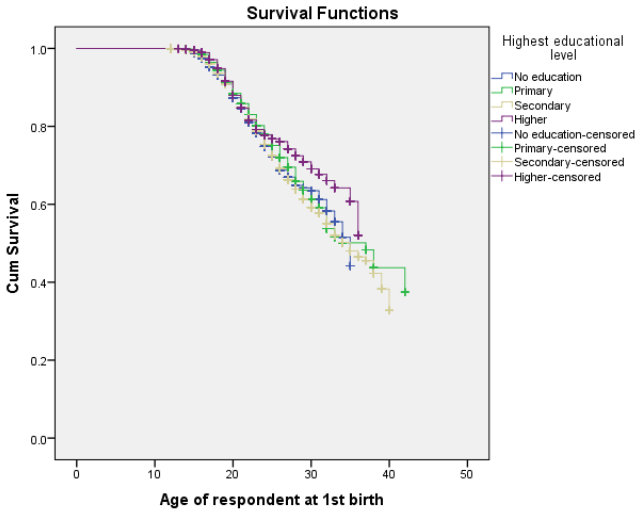
a. Log rank Chi-squared statistic =13.03, p=0.367



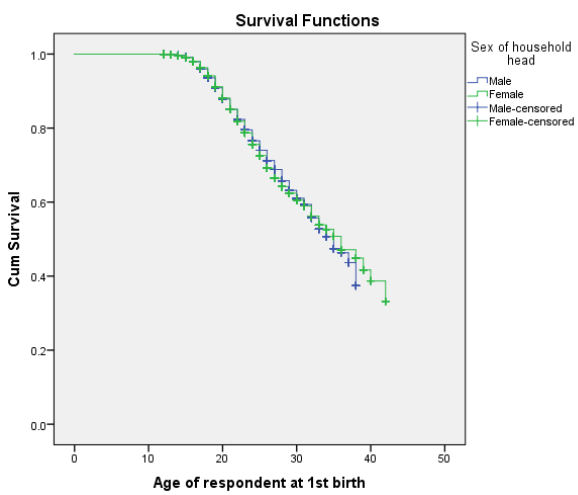
b. Log rank Chi-squared statistic =1.473, p=0.225



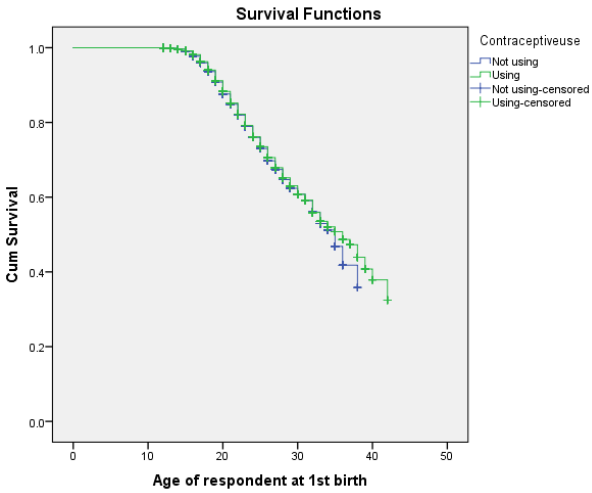
c. Log rank Chi-squared statistic =11.310, p=0.079



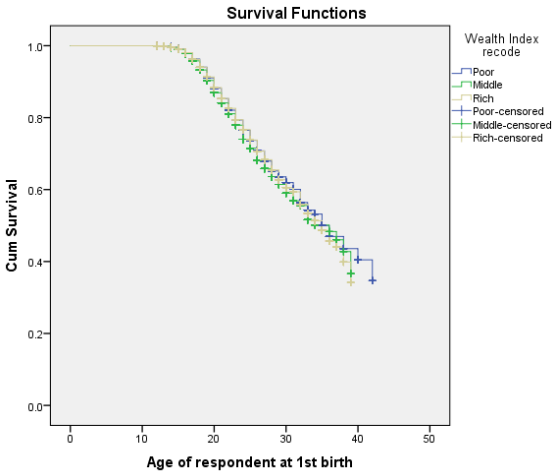
d. Log rank Chi-squared statistic =11.466, p=0.01*



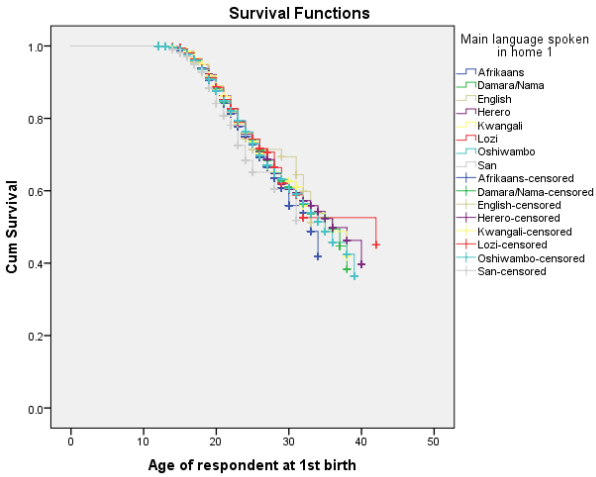
e. Log rank Chi-squared statistic =0.149, p=0.700



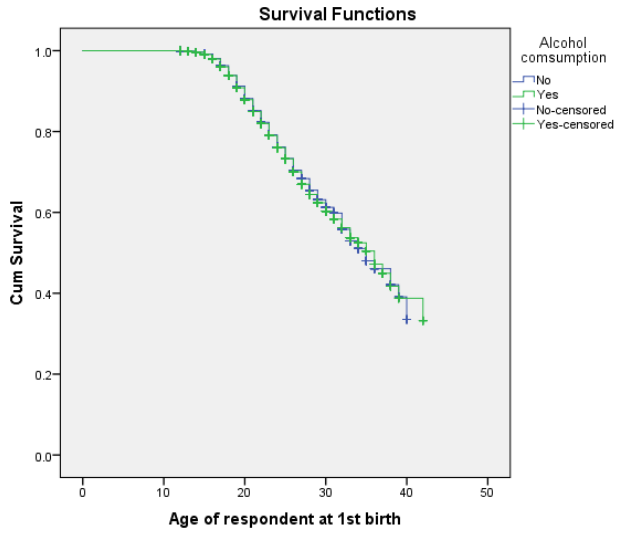
f. Log rank Chi-squared statistic =10.408, p=0.732



g. Log rank Chi-squared statistic =7.533, p=0.110



h. Log rank Chi-squared statistic =13.619, p=0.092



i Log rank Chi-squared statistic =0.573, p=0.449

Figure 2. (a-i) Kaplan Meir Curves

The KaplanMeir curves and their corresponding Mantel-Cox Log rank tests suggest significant differential in the timing of motherhood at 5% level by highest level of education only (Log rank Chi-squared statistic =11.466, p=0.01).

Cox Regression Results

The Cox's regression results to establish the determinants of the transition to motherhood are summarized in Table 2.

Table 2.Cox regression Results.

Independent Variables	**P-value**	**Hazard Ratio (HR)**	**95.0% CI for HR**	
***p<0.050, **p< 0.01, ***p<0.001**				
			Lower	**Upper**
Region				
Zambezi	0.84	0.98	0.85	1.15
Erongo	0.26	1.09	0.94	1.27
Hardap	0.64	1.04	0.89	1.20
Karas	0.13	1.12	0.97	1.30
Kavango	0.03	1.17*	1.02	1.35
Khomas	0.03	1.18*	1.02	1.36
Kunene	0.17	1.11	0.96	1.28
Ohangwena	0.10	1.13	0.98	1.30
Omaheke	0.30	1.08	0.93	1.26
Omusati	0.06	1.17	1.00	1.36
Oshana	0.23	1.10	0.94	1.29
Oshikoto	0.22	1.10	0.94	1.28
Otjozondjupa (Reference)		1.00		
Type of place of residence				
Urban	0.19	1.05	0.98	1.12
Rural (Reference)		1.00		
Age in 5 year age group				
15-19	0.45	1.09	0.87	1.37
20-24	0.08	1.21	0.98	1.49

25-29	0.34	1.11	0.90	1.36
30-34	0.51	1.07	0.87	1.32
35-39	0.14	1.18	0.95	1.45
40-44	0.10	1.21	0.97	1.51
45-49 –(Reference)		1.00		
Highest educational level				
No education	0.10	1.16	0.97	1.38
Primary	0.52	1.05	0.90	1.22
Secondary	0.10	1.13	0.98	1.30
Higher (Reference)		1.00		
Sex of household head				
Male	0.68	0.99	0.93	1.05
Female (Reference)				
Contraceptive use				
Not using	0.23	1.04	0.98	1.10
Using (Reference)		1.00		
Religion				
Roman catholic	0.59	1.03	0.93	1.14
Protestant/Anglican	0.91	0.99	0.90	1.10
Elcin	0.75	1.02	0.92	1.12
Seventh-day Adventist, No religion and others (Reference)		1.00		
Wealth Index				
Poor	0.42	1.03	0.96	1.11
Middle	0.03	1.09*	1.01	1.18
Rich (Reference)		1.00		
Main language spoken in home				
Afrikaans	0.20	0.85	0.66	1.09
Damara/Nama	0.06	0.79	0.62	1.01
English	0.20	0.80	0.57	1.12
Herero	0.02	0.75*	0.58	0.96
Kwangali	0.01	0.73*	0.57	0.94
Lozi	0.07	0.78	0.60	1.02
Oshiwambo	0.05	0.79	0.62	1.00
San (Reference)		1.00		
Consumption of alcoholic drink				
No	0.93	1.00	0.94	1.06
Yes (Reference)		1.00		

With regard to region, women in Kavango region (HR=1.17, p=0.03, CI= (1.02, 1.35)) and Khomas region (HR=1.18, p=0.03, CI= (1.02, 1.36)) were more likely to have early first birth compared to their counterparts in the Otjozondjupa region. Women in the middle wealth quantile (HR=1.09, p=0.03, CI= (1.01, 1.18)) were more likely to have early first births compared to the richest women. With regard to main language spoken at home, women who speak Herero (HR=0.75, p=0.02, CI= (0.58, 0.96)) and Kwangali (HR=0.73, p=0.01, CI= (0.57, 0. 94)) at home had were less likely to have early first birth compared the San speaking women.

However, type of place of residence (p=0.19), age (p=0.06), educational level (p=0.09), sex of household head, contraceptive use (p=0.23), religion (p=0.88), consumption of alcohol (p=0.93) did not significantly influence the transition to motherhood.

DISCUSSION

In this study region, wealth index and main language spoken in homes were found to be significantly associated with age at first birth. With regard to region, more women in Kavango and Khomas had their first births in their early ages of their reproductive years. A study done by USAID in 2011 in Kavango region using data collected through (KTFS 2011) indicated that Kavango had a highest percentage (34%) of teenage pregnancy compared other region in Namibia, which this study also picked up.

Wealth index, was found to influence transition to motherhood among woman in Namibia. Limited power in making their own marital and reproductive choices is a reality for most women living in low-income countries, especially for the younger ones(Klingberg-allvin & Institutet, 2008). This can be said about Namibia especially in Kavangoregion where it yielded a highest percentage of women that had the first birth in their teenage years. Nearly 90% of births occurring to Kavango teens were unwanted at the time of conception which resulted from the limited choice they had in terms of their cost of living (Magazi et al., 2011).

Other studies also showed that macroeconomic factors such as wealth, education of teens and adults and general unemployment rates could contribute to transition to motherhood. A study done by USAID in Kavango region on teenage pregnancy has indicated in rural areas, transactional sex reportedly more frequently for money and cell phones. The study further stated that teens registered at school readily report intense competition for status which is waged by buying and consuming or displaying luxury items, which eventually end up in them engaging in sexual activities at a very young age (Enyegue & Magazi, 2011).Miller (2005) states that the motherhood postponement premium is largest for college-educated women, and those in professional and managerial occupations, which supports a human capital story for the timing effect. She further emphasis that motherhood delay matters because of its potential effects on maternal and infant health, population size, and sexual equity.

CONCLUSION

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Results indicated that almost half of the women (47.9%) transitioned to motherhood in their teenage years. Factors influencing the onset of motherhood were region, socio-economic status and cultural factors. To reduce early onset of motherhood in Namibia, efforts should be region specific and poverty eradication programs should be stepped up to improve the economic empowerment of women. Policy should also address cultural factors which may encourage early onset of motherhood among girls.

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