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Fertility Differentials in Malawi: Any Lesson Learnt from Regional Socio-economic and Demographic Variations? Fertility Differences in Malawi

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ABSTRACT In Malawi, fertility is declining gradually with an average number of 5.5 children per woman. This is despite the country's reported improved women's contraceptive use of 46 percent recently. The study, therefore, explored socioeconomic and demographic factors associated with fertility levels at regional level in Malawi. Using 2010 Malawi Demographic and Health Survey data and Poisson Regression Model, the correlates of fertility across regions were estimated. The study found that central region had the highest fertility levels followed by northern region. Nationally, this was attributed by women's age, education, wealth status and year of marriage. On behaviour perspectives, it was observed that living number of children and ideal number of daughters influenced fertility position. Therefore, fostering of policies aims at implementing household based behavioural change among people and promotes formal education among women if a country is trying to attain low fertility levels.

INTRODUCTION

Over the past decades the world total fertility levels have been declining tremendously. Recent statistical data indicates that the total fertility rate (TFR) shifted from about 4.7 in 1970 to about 2.5 in 2013 (PRB 2014). Over a similar period, decomposed statistics shows that more developed countries' TFR declined from 2.3 in 1970 to 1.6 in 2013 (PBR 2014; WHO 2014). Likewise, in sub-Saharan Africa region, fertility levels slightly declined from 6.7 in 1970 to 5.1 in 2013. Despite this regional development, the levels remained the highest compared to other regions such as Latin America (TFR=2.2), South America (TFR=2.1) and Asia (TFR=2.2) (WHO 2014).

As early as 1978, Bongaart stated that women's socioeconomic status and equity towards women's participation in formal labour employment among others provided women with an opportunity cost which results in behavioural change and subsequent reduction in childbirth. Additionally, other studies relate such lower fertility among women to delay in age of marriage and subsequent increase in mean age of bearing first child among women (Jones et al. 2009; Jones et al. 2007).

In Malawi, recent statistics revealed that the country's mean fertility rate stood at 5.5 children per woman (World Bank 2015). This implies that on average a woman had at most 6 children in her reproductive history. Previous studies postulated that the country's high fertility was associated partly to cultural beliefs that promote couples having more children (Palamuleni 2014) and such perpetual cultural belief that indicate having more children, as a pictogram of societal respect and pride with the communities (Palamuleni 2013). Therefore, such sociocultural and ethnic heterogeneity which is definable across the country has had a bearing slowing progress on initiatives aimed at reducing fertility in the country (Palamuleni 2014). Among the initiatives include inadequate community based advocacy on the family planning significant to quality of life, among others (Palamuleni 2013; Jones 2009). In another aspect, low account of the preventive checks that affect married couple's universal use and adoption of modern contraceptives, resulted in stalled fertility among communities in Zambia and Rwanda (Grabbe et al. 2009). Furthermore, it has been affecting individuals at household levels (Palamuleni 2014).

As a way of part of the redress strategy to maternal health issues, Government of Malawi

introduced and adopted policies aimed at enhancing women's reproductive health wellbeing. Among such strategies include Reproductive Health Strategy and the National Reproductive Health Policy (NRHP) (Government of Malawi 2006). The objectives of these policies included an enhancement of women's reproductive health life through provision of health care services aimed at scaling up reduction of maternal and child mortality and morbidity, use of modern family planning methods in order to attain quality instead of quantity childbirths. In supporting government efforts, non-governmental organisations such as Population Services International, Family Health International, Adventist Relief and Development Agency and private healthcare service providers like "Banja La Mtsogolo" (literary means Future Health Family) embarked on reproductive health programmes to informing, educating and communicating on use of modern reproductive health choices, sexual and reproductive health education, HIV and AIDS programmes, among others (NSO and ICF Macro 2011). Despite such enhancing initiatives which increased contraceptive uptake among women from 11 percent in 1990s to 46 percent in 2010, the country's mean number of children per woman remain one of the highest in the sub-Saharan region (PRB 2014).

Previous studies pointed out a number of factors that have been associated with increased fertility levels around the world. For instance, Adhikari (2010) attributed desire for more children among couples, resident in rural areas, inadequate use of family planning and ever-experienced child death. Furthermore, disagreements between couples' on the number of desired children and gender preference was among the behavioural predictors of higher fertility in Nigeria and Korea (Eguavoen et al. 2007; Virtala et al. 2011). Blanc et al. (1998) who also examined sexual behaviour and contraceptive use in developing countries observed that consistent use of contraceptive by women had had a significant effect in reducing fertility. On the contrary, inconsistent use, due to socio-cultural factors, was associated with either minimal or reduced use of contraceptives and subsequent that had little impact to reduce fertility levels in sub - Saharan Africa compared to the developed region counterpart (Fernandez et al. 2006; Bongaart 2003; Hogan et al. 2000).

Studies have observed that inadequacy in repositioning strategies aimed at leveraging and improving reproductive health outcome has a challenge in most developing countries since early 1980's (Becker 1981). This consequently derails accessibility of reproductive health information and increased inadequate understanding on positives of modern reproductive among families with in turn influence the women's reproductive health well-being ((Fernandez et al. 2006; Kalanda 2010). These cause families to lose an opportunity of having a reasonable family size (Becker 1981). On the same note, it is hypothesized that societies with improved women status through targeted empowerment policies have transited fast enough to attain low fertility levels (Bongaart 2003). Therefore, such preventive check policies range from covering women's socioeconomic promotion to participation in paid-up labour force and enhancement of women rights is paramount for women to have informed choice about their reproductive health wellbeing (Skirbekk 2008).

Despite many efforts to address increase reproductive health well-being of women, fertility levels remain one of the highest in Malawi relative to other countries in sub-Saharan Africa (PRB 2014). For instance, across the country's three regions variations still exist as recent study indicates that the Northern region fertility level stood at as high as 5.7 children per woman, Central region at 5.8 and Southern region at 5.6 (NSO and ICF Macro 2011). Therefore, as fertility is a significant component of population change due to its long term influence on size and structural dimensions (WHO 2014), consistent and frequent studies aimed at understanding different factors associated with this population dynamic process cannot be overemphasised.

Therefore the present study examined regional socioeconomic, demographic and behavioural factors associated with fertility differentials in Malawi. Such information is significant not only to redirect on reproductive health policies but also assists in understanding regional and national factors still causing fertility stall in Malawi.

METHODOLOGY

Data Sources

The study uses data from 2010 Malawi Demographic and Health Surveys (MDHS) (NSO and ICF Macro 2011). The 2010 MDHS is a national representative sample survey designed

to provide information on maternal and child health, fertility and fertility preferences, maternal and child Mortality, nutrition, and HIV/AIDS and other morbidity and human rights knowledge.

Sampling Frame and Sampling Technique

The 2010 MDHS used list of sampling design called enumeration area with population and households listing information from population and housing census of 2008. As the country is administratively subdivided into 3 regions namely: northern, central and southern region, the researchers adopted the same regional administrative defined nomenclature. The regions comprise 27 districts making 849 clusters or enumeration areas. Out of these clusters, 158 were urban and 691 were rural. In 2010 MDHS survey, the primary sampling unit used was households and individuals. In addition, sample survey used a two staged stratified sampling to select the respondents. As such about 27, 345 households were identified, out of which, 23, 020 individual women-respondents were identified and interviewed (NSO and ICF Macro 2011).

Definition of Variables

Dependent Variables

The study used children ever born, a direct count measure of fertility. In the study children ever born (CEB) is defined as follows:

Children ever born (CEB) $=\lambda = \{0, 1, 2, 3, \ldots\}$

where λ in this case is the mean number of children ever born per woman. The number of children ever born to a woman duly explains the reproductive behaviour of that woman at both present and past period. CEB can therefore be interpreted as the best measure cohort and period fertility behaviour among women over time (Hotz et al. 1997).

Independent Variables

To ascertain interrelationships between fertility and socioeconomic factors, and based on the review of the existent literature (Palamuleni 2014; Adhikari 2010) and available data, socioeconomic and behavioural factors were determined. The socioeconomic variables were defined as follows: age of the respondents- coded in 5 year age group of women ranging from 15 to 49 as 15-19, 20-24, …, 45-49. Marital status defines the marital status of the respondents and is classified as never married, married, cohabiting and ever married. Educational status defines women's education status and was measured based on level of education attained over time and categorized as no education, primary level and secondary and over. Place of residence was classified as either respondents are from rural or urban areas, in order to understand fertility differences by place of residence. Wealth index was classified as poorest, poorer, middle class, richer and richest. In the empirical modelling, this was categorised as poor, middle class and rich in order to cluster number of observations to improve on the number of observation for better result estimation. Religion was classified as Catholic, Protestants and Muslims. In this case, protestants included those belonging to Anglican, Seventh day Adventist and Baptists and other Christians. Year of marriage which is a periodic categorical variable was classified women who married between the years *1975-1980*, *1981-1990*, *1991-2000* and *2001-2010*. This was aimed at understanding the differentials in fertility over the period of time in Malawi and across regions.

Behavioural factors considered were: respondents' number of living children which were classified as *"None"* implying having no children, *"1 to 4"* implying having at most 4 children and *"5+"* implying having at least 5 children. Contraceptive usage decision of the respondents was classified into two categories, *"Respondent"* implying decision made by the respondents alone and *"other"* implying decision made by other members other than the respondents. Desire to have more children was classified as "more children", *"Undecided"* on the number of children and *"Enough"* for those respondents indicating to have enough children based on the existing number of children. Ideal number of boys which defines the number of boys' respondents anticipates bearing classified as at most 4 children and at least 5 children in turn. Similarly, the number of girls was defined likewise. Age at first sexual practice classified as less and equal to 19 years, 20-34 and 35 years and above, defines the first ever experience of the respondents on sexual practice. Finally, a regional dummy variable region was defined for each region and was significant to disaggregate the variables in order to assist in regional fertility analysis.

Method of Analysis

As indicated above, the study object was to understand determinants associated with fertility differences across regions in Malawi. According to literature total fertility is defined as an aggregate of age specific fertility rate between women within reproductive ages at a designated period multiplied by 5 (Bongaart 2008). The study chose to use children ever-born as a measure of fertility relative to total fertility due to the fact that children ever-born is a measure life time fertility attained by a woman (WHO 2014). The study's special interest is regarding fertility with emphasis on women aged 40-49 because women belonging to such age groups are presumed to have completed their child bearing process hence their fertility is close to total fertility rates (Palamuleni 2014).

The study used two analytical approaches in order to understand the socioeconomic, demographic and behaviour factors associated with fertility regional differences in Malawi. However using women's individual records which directly account for women themselves as respondent giving information about their socioeconomic attribute (ICF & Macro 2011), provides direct response befitting credibility and reliability of data the study of this nature requires. Percentage was an adopted mechanism used to describe socioeconomic, demographic and behaviour attributes of the respondents used and tested in the study.

Additionally, a multivariate relationship between independent vectors on outcome vector corresponding to national and regional perspectives was performed using Generalised Poisson Regression Model in Stata 13.0 (Wang and Famoye 1997; Poston et al. 2006). The equation (1) below illustrates the modified poisson regression model used in this study.

$$log(\lambda_i) = \alpha_i + \sum_{i=1}^{n} \beta_i \psi_i + \varepsilon \quad \ldots\ldots(1)$$

where, in this case, γ is the outcome variable - children ever-born per woman *i*, α is the constant term derived on the assumption that the explanatory vectors are zeroed in the model, $\varnothing$ is the set of set of explanatory vector, β is a set of parameter coefficient related to explanatory vector and $\in$ is the stochastic error term.

The mean and variance of the CEB (are equal while assuming that the distribution is equidispersion. An Akaike Information Criteria (AIC) was used to rank the models on the assumption that the smaller the Akaike information criteria value the better the model.

$$AIC = -LnL + K \quad \ldots\ldots(4)$$

Where the log likelihood value is estimated by the model and is the number of estimated parameters. It is important to note that the smaller the AIC value derived, the better the model. In that aspect, the ranking of the significance of the model was based on the AIC derived value in order to redirect both national or regional based policies and interventions.

RESULTS

Background Characteristics of Respondents

More than one-fifth of the women (21.0%) and (21.9%) were youthful women aged 20-24 and 25-29 respectively and these age categories were slightly higher than women aged 44-49 at national level. This national statistics is similarly proportional to the regional statistics which has a range of 8 percent to at most 22 percent between the women with advanced maternal age (44-49) as compared to the youthful women within the ages of either 20-24 or 25-29 respectively. Majority of women (66.6%) completed their primary education in Malawi with more women (73.9%) of these coming from the northern region and 66.2 percent and 64.2 percent from central and southern region respectively. A considerable number of women are resident in rural areas (87.1%) nationally. Of these, 88.6 percent were from Central region with northern and southern region slightly lower at 87.9 percent and 85.8 percent respectively. An overwhelming majority of the women over 65 percent were married at national level. At regional level northern and central region have at most 69 percent each of these married women as compared to southern region with about 65.7 percent women with marital status. At national level, the proportion of the poor and the middle class women are almost at par at about 40 percent. At a regional level, it is observed that southern relates to national statistical position. On the same note, the northern region was found to have 51 percent of women belonging to the middle income sect whereas about 50 percent of the women in the Central region are poor.

On an average majority of the women (68.6%) were Protestants at national level. Large propor-

Table 1a: Socioeconomic, demographic characteristics of the women

Variable	*Category*	*National*		*North*		*Central*		*South*	
		N	*(%)*	*N*	*(%)*	*N*	*(%)*	*N*	*(%)*
Age									
	15-19	2,179	-11.3	412	-12	657	-10.1	1,110	-11.9
	20-24	4,049	-21	720	-20.9	1,386	-21.4	1,943	-20.8
	25-29	4,208	-21.9	741	-21.5	1,392	-21.5	2,075	-22.3
	30-34	3,187	-16.6	543	-15.7	1,038	-16	1,606	-17.2
	35-39	2,460	-12.9	443	-12.8	860	-13.3	1,157	-12.4
	40-44	1,675	-8.7	302	-8.8	611	-9.4	762	-8.2
	45-49	1,502	-7.8	288	-8.4	543	-8.4	671	-7.2
Education Attainment									
	No education	3,132	-16.3	136	-3.9	1,221	-18.2	1,775	-19
	Primary	12,826	-66.6	2,547	-73.9	4,292	-66.2	5,987	-64.2
	Secondary +	3,302	-17.1	766	(22.2	974	-15	1,562	-16.8
Place of Residence									
	Urban	2,478	-12.9	416	-12.1	738	-11.4	1,324	-14.2
	Rural	16,782	-87.1	3,033	-87.9	5,749	-88.6	8,000	-85.8
Marital Status									
	Never married	1,371	-7.12	207	-6	414	-6.4	750	-8.04
	Married	13,056	-67.8	2,404	-69.7	4,522	-69.7	6,130	-65.7
	Living together	1,864	-9.7	340	-9.9	667	-10.3	857	-9.2
	Formerly married	2,969	-15.4	498	-14.4	884	-13.6	1,587	-17
Wealth Index									
	Poor	7,723	-40.1	855	-24.8	3,062	-47.2	3,806	-40.8
	Middle	7,950	-41.3	1,773	-51.4	2,403	-37	3,774	-40.5
	Rich	3,587	-18.6	821	-23.8	1,022	-15.8	1,744	-18.7
Religion									
	Catholic	3,821	-20	573	-16.7	1,524	-23.9	1,724	-18.6
	Protestant	13,091	-68.6	2,838.00	-82.5	4,278	-67.2	5,975	-64.5
	Muslim	2,170	-11.4	29	-0.84	569	-8.9	1,572	-16.9
Year of Marriage									
	1975-1980	887	-4.9	152	-4.7	315	-5.2	420	-4.9
	1981-1990	3,348	-18.7	622	-19.2	1,168	-19.2	1,558	-18.2
	1991-2000	6,508	-36.4	1,101.00	-33.9	2,147	-35.4	3,260	-38
	2001-2010	7,146	-39.9	1,367.00	-42.2	2,443	-40.2	3,336	-38.9
Total N (%)		19,260	100	3,449	100	6,487	100	9,324	100

tion of these Protestants are from the northern region (82.5%) with southern region having the least number of women (64.5%). At regional level, over 30 percent of the women married within the years 1991 to 2000 and 2001 to 2010 respectively.

Based on behavioural characteristics, 65.3 percent of the women at national level reported not to be decided on the number of children they want to bear in their life time. At regional level, about a quarter (26.4%) and (26.6%) were reported having no intention to have more children whereas in southern region 21.1 percent of the women indicated to have no interest to increase number of children. A noteworthy observation on decision to use contraceptive was made at national level and it indicates that about 88 percent of the women are not capable of making an independent decision on contraceptive usage choice. At regional level, over 90 percent of the women relied on the influence of other on contraceptive usage. In terms of ideal number of boys and girls that the respondents desire, majority of the women over 90 percent require less number of boys and girls across the country and regions respectively. Only about 61.2 percent of the women had sexual intercourse for the first time before and equal to age 19 at national level. Across the regions, Southern region had majority of the women who had sex before the age of 19 (67.7%). In addition, of the total women from the northern region, about 61 percent of them reported to have had sex before their 19th birth day, On the same note, about half (52.1%) of the women from central region had sex before 19 years of age. Tables 1a and 1b are

Table 1b: Behaviour characteristics of women respondents

Variable *Category*	*National*		*North*		*Central*		*South*	
	N	*(%)*	*N*	*(%)*	*N*	*(%)*	*N*	*(%)*
Number of Living Children								
Desire more	2,091	-10.9	349	-10.1	671	-10.3	1,071	-11.5
Undecided	12,571	-65.3	2,190	-63.5	4,093	-63.1	6,288	-67.4
No more	4,598	-23.9	910	-26.4	1,723	-26.6	1,965	-21.1
Decision of Contraceptive								
Respondent	842	-12	206	-14.9	212	-9	424	-13.4
Other	6,049	-88	1,177	-85.1	2,132	-91	2,740	-86.6
Ideal Number of Boys								
<=4	18,916	-98.2	3,378	-97.9	6,383	-98.4	9,155	-98.2
5 +	344	-1.8	71	-2.1	104	-1.6	169	-1.8
Ideal Number of Girls								
<=4	18,815	-97.7	3,365	-97.6	6,357	-98	9,093	-97.5
5+	445	-2.3	84	-2.4	130	-2	231	-2.5
Age at First Sexual Intercourse								
<= 19 years	11,794	-61.2	2,104	-61	3,378	-52.1	6,312	-67.7
20 +	7,466	-38.8	1,345	-39	3,109	-47.9	3,012	-32.3
Total N (%)	19,260	100	3,449	100	6,487	100	9,324	100

an outline of the univariate characteristics of women.

Multivariate Analysis

In multivariate Table 2a four separate models for national northern, central and southern region were simulated using poisson regression model. However, these models were further tested for their relative significance on each other using Akaike Information Criterion.

As the results in Table 2a entail, as age of respondents change by a unit, the difference in the log of expected count in fertility linearly increased as maternal age advances across the categories. A noteworthy category age group 44-49 had a significantly and more significant increase on fertility at $p < 001$.Yet across the regions, as northern region expected log count in fertility increased by a coefficient of 0.978, central and southern region log difference expected count in fertility was as high as 1.080 and 1.054 respectively.

It was also noted that a unit change among women with no education at national level are found to slightly reduce the difference expected log count in fertility by 0.040. Similarly, for those with primary education, the national results indicate that the expected log count in fertility decreased by 0.2 as compared to those with secondary education. Considering the regional differentials, women with no education in northern and southern region insignificantly affect fertility while southern region was found to have a slight decrease and highly significant statistically at 0.232 as compared to those with secondary education. In as far as the place of residence was concerned; those living in rural were found to significant increase fertility levels by 0.066 as compared to those in the urban area. Even though the analysis showed the regions to have positive concurring parameter coefficients that increase fertility levels, the regional impact on fertility were statistically insignificant. In addition, the wealth indicator shows that as women become richer their fertility levels significantly decreased at $p < 0.001$. Regionally, it was found that as the women rise in wealth status, their fertility congruently decreases at 5 percent level of significance. Regarding religion, although universally insignificant, Muslims were found to have higher parameter coefficient of 0.025 to increase fertility levels at national level. It was observed that Muslims in the northern region decreased fertility levels greatly contrary to those in central and southern region that reported to have an increased pattern within the parameter coefficients of 0.026 and 0.033 respectively. Furthermore, women who reported to have married between 1981 and 1990 were found to be slightly decreasing their fertility levels compared to those married between 1975 and 1980 as refer-

Table 2a: Poisson regression: women socioeconomic status influence on fertility

	National β	*North* β	*Central* β	*South* β
Age of Respondents				
15-19 [RC]				
20-24	0.527***	0.504***	0.475***	0.573***
25-29	0.806***	0.808***	0.774***	0.831***
30-34	0.889***	0.859***	0.883***	0.915***
35-39	0.946***	0.888***	0.962***	0.966***
40-44	**0.993*** **	**0.925*** **	**1.017*** **	**1.012*** **
45-49	**1.043*** **	**0.978*** **	**1.080*** **	**1.054*** **
Education				
No education	-0.040**	-0.028	-0.024	-0.046**
Primary	-0.200***	-0.142**	-0.189***	-0.232***
Secondary + [RC]				
Place of Residence				
Urban [RC]				
Rural	0.066**	0.061	0.046	0.073
Wealth Index				
Poor [RC]				
Middle	-0.02*	-0.044	-0.012	-0.024
Rich	-0.09***	-0.091**	-0.079**	-0.099**
Religion				
Catholic [RC]				
Protestant	0.004	-0.020	0.001	0.029
Muslims	0.025	-0.024	0.026	0.033
Year of Marriage				
1975-1980 [RC]				
1981-1990	-0.083**	-0.042	-0.084*	-0.095**
1991-2000	-0.190***	-0.156*	-0.195**	-0.197***
2001-2010	-0.470***	-0.435***	-0.474***	-0.474***
Akaike Information Criteria(AIC)	21,280	7,365	4,281	10,019
Rank	**0**	**2**	**1**	**3**

HINT: * significant = $p < 0.1$; ** = $p < 0.05$, *** = $p < 0.001$

ence category. Likewise, it was found that young couples who got married between 2001 and 2010 highly decreased their fertility levels as compared to those married decades before at national levels. Such a pattern was consistent across the region.

Therefore, considering the behaviour multivariate outcome illustrated in Table 2b , it was found that women having number of living children between 1 and 4 at national level were statistically significant at $p < 0.001$ with higher increasing fertility at 1.698. Women with 5 children and over were found to be highly significant at $p < 0.001$ with a fertility increase parameter of 2.037. Across the regions, with an exception of northern region, central and southern region women with number of living children between 1 and 4 were congruently highly significant at 1.507 and 1.859 higher in fertility levels respectively.

With regards to the contraceptive decision making, although not significant, women influenced by others in the southern region were inversely related to fertility levels as compared to other regions and national level relative to women with independent decision in contraceptive utilization. Therefore as far as decision making on the number of children to bear, those who indicated not to have more children were statistically significant at $p < 0.001$ with a higher parameter coefficient of 0.093. Regionally, southern region is similarly statistically significant at $p < 001$ and coefficient of 0.103 while northern and central region were both significant at $p < 0.05$ corresponding to 0.085 and 0.087 higher in increasing fertility level. In as far as desired number of children by women by gender was concerned, girl child preference among women with 5 girls and over were found to be moderately significant at $p < 0.05$ level corresponding to a parameter coefficient of 0.073 higher to influence fertility across the country. This national finding was slightly higher than national with a

Table 2b: Poisson regression: behaviour factors in relation to fertility

	National β	*North* β	*Central* β	*South* β
Living Children				
None [RC]				
1 to 4	1.698***	1.153	1.507***	1.859***
5+	2.037***	1.527**	1.832***	2.189***
Contraceptive Use Decision				
Respondent [RC]				
Other	0.005	0.03	0.0182	-0.013
Ideal Number of Boys				
< = 4 [RC]				
5+	0.071	0.078	0.066	0.064
Ideal Number of Girls				
< = 4[RC]				
5+	0.073**	0.05	0.077	0.095*
Age at First Sex				
<= 19 year [RC]				
20 +	-0.014	-0.007	-0.014	-0.018
AIC	21.280	7.365	.4.281	10.019
Rank	0	2	1	3

Hint: * significant = p < 0.1; ** = p < 0.05, *** = p < 0.001

parameter coefficient of 0.095 at p < 0.1 significant level. However, girl child preference was found to be insignificant though positively concurring in northern and central region of the country. With regard to age at first sexual encounter, it was observed that women who reported to have sexual intercourse after 20th birth day and over were consistently although insignificantly having a negative effect on fertility levels across the country and regions compared to those reported to have experienced sexual intercourse for the first time aged 19.

DISCUSSION

This study found that middle age women between 25 and 29 years give birth to about 3.05 mean number of children and those with advanced maternal ages of 44-49 give birth to a mean number of children ever born equivalence of 6.85 at national level. At regional perspective, women aged 44-49 from central region was found to have fertility equivalence of 7.39 relative to 6.7 and 6.5 associated with northern and southern region respectively. These increased numbers of children existent among women without regard of the socioeconomic and behaviour differentials require more focussed programmes aimed at controlling this fertility level dimension across the country's region in Malawi.

Based on the study, considerable differences exist among place of residence, wealth index, religion, and the year that that the women married in as far as socioeconomic dimensions was concerned. In another perspectives, number of living children by a woman, desire to have more children and ideal number of girls were partly significant from within the categories. Compared to other studies, the study concurrently found that as the women become of age, their corresponding fertility increase (OlaOlorun et al. 2014; Adhikari 2010). Similarly, the study postulates that as women advance in age, their fertility levels remain high compared to their counterparts with younger median age. On the other hand, an increase in the level of education has an adverse bearing on fertility levels in Malawi and across the region. As women's level of education increases not only has fertility respond negatively at national level but also correspondingly significantly inversely related to fertility at regional level. Therefore, as the women participate in education, levels of information, elements of direct or indirect empowerment enables women to be more likely to have an opportunity cost of getting employed in the formal economy thereby minimising the likelihood of bearing children thus the propensity of increasing fertility levels (Becker 1981). The study concurs with the works of Eguavoen et al. (2007) and Bongaart (2003) that earlier suggested that education of the mother negatively affect women cumulative fertility levels. Therefore, need to intensify family planning initiatives among women with primary edu-

cation and those with no education have a positive bearing to increase fertility decline along these education category. Regarding the place of residence, this present study observed that Malawians that are predominantly rural have higher fertility level equivalence of over 7 mean numbers of children ever born as compared to the women from urban counterpart. This is similar to what is postulated earlier (Adhikari 2010; White et al. 2005). Previous studies hypothesized that women in the rural tend to marry at a younger age and thereby start child bearing process much earlier and increase the propensity of fertility accumulation as they advance in maternal age compared to the urban women counterparts (Ratherford et al. 2003; Kohler et al. 2002). Furthermore, the study observed that as women are enriched economically and are above poverty band in Malawi, their fertility levels decrease the higher the wealth hierarchy they escalate. This supports an earlier observation that low income affect access and usage of contraceptive among women in developing country and this consequently result in high fertility levels (Palamuleni 2014; Agha 2000; Cohen 2000). In as far as year of marriage is concerned, it was found that year of marriage has an adverse effect on fertility in Malawi. This was observed in consistent perspectives that couples that married just after millennium have lower fertility and have consistently reduced fertility levels highly as compared to those married before the millennium. This concurs with a multivariate cross country study among developed countries that socioeconomic stress among newly married couples to have a bearing on negative fertility trend as compared to women advanced in ages yet experiencing similar socioeconomic stress (William et al. 2004; Jones et al. 2007), Similarly, in Tanzania, a rise in age at marriage have made fertility decline among couple over the years (Mturi and Hinde 2007).

From the behavioural perspective the study found that women who reported to have high number of children were more likely to have higher fertility relative to those without the children. In addition it was found that the higher the living number of children, fertility levels among such women increases. Therefore the study postulates similar findings that other scholars that women who observe having more number of children as important has higher fertility levels than those with dissimilar perspectives (Adhikari 2010; Palamuleni 2014). In terms of ideal number of children, it is highly hypothesized that ideal number of living children determines fertility levels among women (Sibanda et al. 2003), more importantly regarding male child (Eguavoen et al. 2007). However, based on this present study, the researchers postulate that in Malawi preference of girl child positively affects fertility levels as compared to boy child.

CONCLUSION

In Malawi, fertility levels across the country's regions are significantly high. Based on these findings, a lot of factors positively contribute to these phenomena and are categorically defined either from socioeconomic or behavioural factors perspectives. For instance, socioeconomic phenomenon include women education attainment up to secondary level, married couples between the years 2001 and 2010, advanced maternal age and are in among married women, wave of urbanisation still contributed positively towards high fertility levels in Malawi. In as far as behaviour factors are concerned, the number of living children, daughter preference, age at first sexual encounter among women aged between 20 and 34, desire for more children constitute highly and accounts for increased fertility levels at both regional and national level in Malawi.

Therefore, as far as Malawi is concerned, numerous factors are continuously pertinent and are still major predictors of the country's high fertility levels regionally. For example, increased access to secondary education among women has been proved to reduce number of children ever born thus resulting in reduction of fertility across region and country in the long term.

RECOMMENDATIONS

Therefore, there is need to have an extensive promotion programmes on contraceptive in order to increase levels of uptake among women, thereby emulating other countries with success story on fertility decline using modern reproductive health methods. There is need to have targeted programmes on socioeconomic and behavioural change more importantly among rural and underprivileged people in order to scaling-up their understanding on the general is-

sues related to reproductive health. Last but not least, there is need for couples to understand the significance of joint decision making on the number of children and the positive and negative consequences associated with such choices. Lastly, the need to research further as to how daughter preferences affect fertility levels in Malawi, cannot be overemphasised.

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