Teenage pregnancy in Africa: Trend and Determinants in the 21st Century

Authors Opeyemi Odejimi[a] and Denise Bellingham-Young[b]

a. Opeyemi Odejimi- Masters of Public Health, Faculty of Education Health and Wellbeing.

b. Dr Denise Bellingham-Young- Senior Lecturer, Faculty of Education Health and Wellbeing,
University of Wolverhampton, United Kingdom.

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Abstract

Background: Africa remains one of the continents with the highest levels of teenage pregnancies in the world. In spite of this, there are limited empirical research studies on determinants of teenage pregnancy in Africa. This study aims to investigate the trend and determinants of teenage pregnancy in Africa. Several social and economic factors appear to be the causes of teenage pregnancy in Africa. Therefore, understanding the association between teenage pregnancy and various social and economic factors would help reduce teenage pregnancy rate in Africa.
Methods: Data sets from the World Bank Organisation of all Africa countries between 2000 and 2010 were obtained to conduct this study. The trends of average teenage pregnancy rate across all regions were examined using descriptive method. Also, the association between teenage pregnancy rate and various economic and social factors were investigated using multivariate statistics methods.
Results: In all 52 countries examined there has been a significant reduction in the African teenage pregnancy rate between 2000 and 2010. In addition, correlation analysis carried out showed an inverse significant relationship with life expectancy, literacy rate and contraceptive prevalence. Further analysis reveals that female literacy rate is the most important predictor of teenage pregnancy in Africa.
Conclusion: The findings of this research indicate that social and economic factors are important predictors of teenage pregnancy rate in Africa. Evidence from this study suggests that a practical approach to reducing the current teenage pregnancy rate is to develop strategies and policies that support and promotes female literacy.

Keywords: Teenage pregnancy, Africa, social and economic factors, determinants, trend.

INTRODUCTION

Teenage pregnancy remains an important public health concern both in developing and developed countries. Teenage pregnancy has been defined by the World Health Organisation (WHO) 2004 as pregnancy in females aged 15- 19 years. According to WHO (2012) report, an equivalent of 16 million girls aged 15-19 years become pregnant on a yearly basis; In addition, 95% of all teenage pregnancy takes place in developing countries.

Outbridge (2003) makes clear that teenage pregnancy has decreased in developed countries. This view is supported by WHO (2007) report stating that the average teenage pregnancy rate in developed countries was 29 births per 1000; whereas, in developing countries teenage pregnancy rate was as high as 133 births per 1000 females. Furthermore, World Health statistics (2011) report the rate in Africa as 118 per 1000 females.

Chemuru and Srinivas (2015) made clear that teenage pregnancy could pose problem to the health, social and economic status of a nation. This view is further reiterated by the WHO (2006) stating that teenage pregnancy could pose numerous detrimental health problems to teenage mothers such as: risk of death, pregnancy related illness, high infant mortality rate, low birth weight babies and exposure to sexually transmitted diseases.

Likewise, Aoyama (2011) highlighted that teenage pregnancy causes an upsurge in a nation's population which places a burden on other sectors of the economy, hence, impeding the economic and social progress of such nations. Furthermore, this can lead to extreme poverty especially in lower income countries (Agbemenu, 2011). This concern forms the basis of the 5th Millennium Development Goal ''*improving maternal health*'' (United National Development Programme [UNDP], 2003); with reducing teenage pregnancy used as an indicator for its measurement (Agbemenu, 2011).

Due to the numerous negative effect of high teenage pregnancy rate in Africa, there is a need to research the determinants of teenage pregnancies in Africa. Although, few studies conducted in some African countries have identified some determinants of teenage pregnancy such as Abdsselam (2011) and Were (2007) have identified factors such as poor use of contraceptives in Morocco and low educational attainment in Kenya respectively.

Nevertheless, this research expands on earlier studies done by investigating the determinants of teenage pregnancy for the entire Africa continent by using additional social and economic factors unique to the Africa continent. This study adds to current knowledge in the research community by thoroughly examining the determinants of teenage pregnancy in Africa.

CONCEPTUAL FRAMEWORK

The determinants of teenage pregnancy in developing countries have been identified as majorly social and economic factors, which includes: socioeconomic conditions; educational attainment; urbanisation; family and cultural structure; and under-utilisation of healthcare services (Dev-Raj, 2010; World Bank synopsis, 2010; Chemuru and Srinivas, 2015). The conceptual framework seen in

figure 1 summarises the conceptual model that takes into account the social and economic factors that influences teenage pregnancy rate in Africa.

Isaranurug, Mo-suwan and Choprapawon (2006) as well as Shrestha (2002) highlighted poor socioeconomic conditions such as: income, employment status and income status are associated with high teenage pregnancy rate. Consequently, poor socioeconomic status of individuals is now being recognised not only as a risk factor but also an end result of teenage pregnancy (Health Development Agency, 2003; WHO, 2005). This is because teenage parents often become deprived families, and the vicious cycle continues (Gökçe, Ozsqahin and Zencir, 2007).

Likewise, low education attainment and under-utilisation of healthcare services particularly, sexual health services among female adolescents has been associated with high teenage pregnancy in Africa (WHO, 2012; World Bank, 2010; Lemos 2009; Were, 2007; Bonell et al. 2005; Health Development Agency, 2003; Imamura, 2007). Furthermore, Lemos (2009) highlighted that low educational attainment remains one of the most important determinants of teenage pregnancy, as it greatly impacts on the socioeconomic status of individuals as well as utilisation of sexual health services.

Family and cultural norms such as early marriage in developing countries have also been noted to account for high teenage pregnancy in Africa (Chemuru and Srinivas, 2015). Mangiaterra et al (2008) explains that 90% of all teenage births in Africa occur within marriage and this is close to 100% in Northern Africa. Although, Westoff, Blanc and Nyblade (1994) highlighted that the age of female at marriage is subsequently increasing in Sub-Saharan Africa, however, the World Bank Synopsis (2010) makes clear the pace is quite slow.
An explanation given by Sharma et al (2002) is that early marriage is culturally acceptable in many developing countries. In addition, Dev Raj et al. (2010) rightly points out those adolescent girls rarely take part in decision making. In about 80% of cases, the marriages were decided by the parents without obtaining consent from their daughters (Shrestha, 2002).
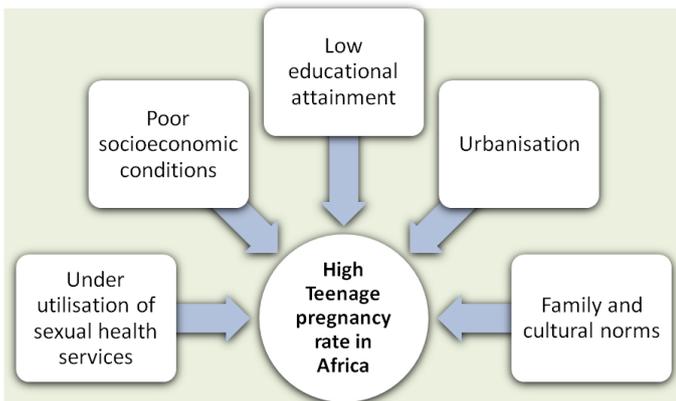
Figure 1: Conceptual Framework

AIM OF THE STUDY

This research paper aims to investigate the determinants of teenage pregnancy in Africa, by exploring social and economic factors unique to African nations that account for differences in their teenage pregnancy rates. This study has evolved from the hypothesis proposed by Singh and Darroch (2000) stating that countries with the lowest teenage pregnancy will most likely be countries with better: education; employment opportunities for women; health care systems; and economic equality.

Besides, the investigation of the association of various social and economic factors can be useful to policymakers in understanding the determinants of reproductive behaviour amongst teenagers in Africa. In addition, the recommendations made from this study can be beneficial in planning targeted interventions in African countries. Moreover, this study can serve as a basis for further research on teenage pregnancy, particularly in Africa and other developing countries.

DATA AND METHODS

This study used data sets from the World Bank Organisation conducted between 2000 and 2010 (World Bank Group, 2012). The study population are countries within African continent. The Africa continent is made up of 54 countries which are sub-divided into 5 regions, these are: North, East, West, Southern and Central. At the time this study was conducted the World Bank held data on teenage pregnancy rate for all 54 African countries except South Sudan and Seychelles, therefore, 52 countries participated in this study.

ETHICAL CONSIDERATIONS

This study is based on an analysis of existing survey data and does not involve any form of contact with human or animal subjects. Data sets utilised in this study have been obtained from the World Bank Organisation freely within the public domain. In addition, these data sets do not contain any information that can breech confidentiality of the participants' countries. Therefore, there are no ethical issues to be considered for this study as it poses no harm.

VARIABLES

The main dependent variable is the teenage pregnancy rates in the countries which are the number of births by females aged 15-19 per 1000 women.

The Independent variables are:

- **GINI coefficient:** This is a measure of a countries level of income inequality. This ranges from 0-100, with zero and 100 signifying perfect equality and inequality respectively.

- **GDP per capita**: This indicates the general standard of living in a country. This rate is usually expressed in US Dollars ($).

- **Literacy rate for adolescent females:** This is the number of females' ages 15 to 24 years who can both read and write and understand short simple statements.

- **Female life expectancy at birth**: This indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.

- **Contraceptive use**: This is the proportion of women aged 15-49, who are practicing, or whose sexual partners are practicing, any form of contraception.

- **Female labour participation rate**: This is the percentage of the population aged 15 and older that is economically active by engaging in the production of goods and services.

- **Health care expenditure:** This is the sum of public and private health expenditure, and It covers the provision of both preventive and curative, as well as family planning activities, nutrition activities, and emergency aid.

- **Gender equality**: This measures the extent to which a country has installed institutions and programmes to enforce laws and policies that

promote equal access for men and women to education, healthcare services, the economy, and protection under law. It ranges from 1-6 with 1 signifying low and 6 high.

STUDY HYPOTHESIS

This study builds on Singh and Darroch (2000) hypothesis. Therefore, it is expected that in countries with high teenage pregnancy rate the GINI index will equally be high; whereas in countries with high teenage pregnancy rate, there will be low: GDP per capita, literacy rate for adolescent females, female life expectancy, gender equality, contraceptive use, female labour participation rate and health care expenditure.

DATA ANALYSIS

First, Data sets from 2000- 2010 were utilised in carrying out the descriptive analysis to determine means, standard deviation and prevalence rate of teenage pregnancy in Africa, and this was presented in tables. Next, a paired sample t-test was conducted, thereafter, data sets from 2008-2010 was used to conduct correlations and regressions.
Microsoft Excel 2007 was used to run descriptive analysis, and IBM SPSS Statistics 19 was the statistical package used in running t-test, correlations and regressions of the association between the relevant socioeconomic variables and teenage pregnancy rate of the Africa countries.

RESULTS

Descriptive Analysis
The mean teenage pregnancy rate across each region from 2000-2010 The mean teenage pregnancy rated across can be seen in Table 1 (see appendix 1). Substantial differences can be noted across each region over the eleven year period, with the mean teenage pregnancy rate highest in Central Africa and lowest in Northern Africa.

Trends of teenage pregnancy in Africa across all regions between 2000 and 2010 are illustrated in figure 2, which points out that the over the eleven year period the mean teenage pregnancy rate across all regions of Africa continued to drop steadily.
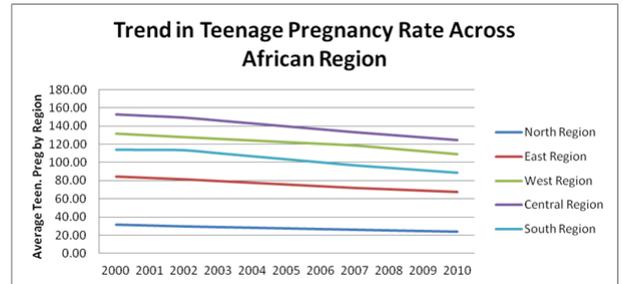

Figure 2: Trends in teenage pregnancy rate across all regions of Africa from 2000-2010

Paired Sample T-Test

Table 2 below shows the result of the paired t-test which indicates that there has been a significant reduction in the average teenage pregnancy rate across Africa between 2000 and 2010 ($t=11.445$, $p<0.000$).

Teenage pregnancy rate	Mean	Std	T
2000	109.44	54.56	$t= 11.445$, $p<0.000$
2010	88.43	47.97	

Table 2: paired sample t-test

Correlation Analysis

As expected, high teenage pregnancy rate is associated with low literacy rate ($r = -0.514$, $p= 0.001$); lower life expectancy ($r = -0.284$, $p= 0.046$); and low contraceptive prevalence ($r= -0.482$, $p= 0.031$). In contrast to the expected direction, although non-significant GINI index ($r= -0.333$, $p=0.225$) produced a negative correlation. Also increased labour participation rate ($r= 0.392$, $p= 0.004$) is associated with high teenage pregnancy rate.

Furthermore, correlation analysis between all variables reveals that as GDP per capital increases, literacy rate also increases ($r= 0.455$, $p=0.006$), Also, increase in GDP per capita is associated with increased contraceptive prevalence ($r= 0.463$, $p= 0.046$). Likewise, increased literacy rate is associated with increased contraceptive prevalence ($r=0.896$, $p=0.000$). In addition, increase in female labour participation is associated with decrease life expectancy $r=-0.442$, $p=0.001$).

Regression Analysis
Simple Linear Regression

Simple linear regression was carried out for the four independent variables which had statistically significant correlation with teenage pregnancy rate. This was conducted to determine how the independent variables predict teenage pregnancy rate. See results in table 3. In general, most of the independent variables were in the expected direction, which is inversely associated with teenage pregnancy rate.

Literacy rate appears to be a significant predictor of teenage pregnancy rate (f= 12.199, B= -1.229, p= 0.001) accounting for 26.4 percent of the variation in teenage pregnancy rate (r^2=0.264). Similarly, contraceptive prevalence (f= 5.453, B=.1.366, p= 0.031) and the life expectancy rate (f= 4.202, B= -1.445, p= 0.046) are significant predictors accounting for 23.3% and 15.4% of the variation in teenage pregnancy rate respectively.

VARIABLES	R^2	F ratio	Beta coefficient	P value
Literacy rate	0.264	12.199	-1.229	0.001
Contraceptive prevalence	0.233	5.453	-1.366	0.031
Labour participation	0.154	8.903	0.946	0.004
Life expectancy	0.080	4.202	-1.445	0.046

Table 3: simple linear regression analysis model

In contrast to the expected direction, there was a direct relationship between teenage pregnancy rate and labour participation rate (f= 8.903, B= 0.946, p= 0.004).

Stepwise Regression Analysis

Stepwise regression was used to identify the best predictor of teenage pregnancy in Africa. A significant model emerged which comprises of only literacy rate ($F_{1, 13}$ =9.607, P= 0.008, Adjusted R^2=0.381, Beta coefficient = -0.652). This signifies that literacy rate is a significant predictor in the regression model accounting for 38.1 per cent of the variation in teenage pregnancy rate and in countries with high female literacy rate; the teenage pregnancy rate will be lower.

DISCUSSION

Trend Of Teenage Pregnancy In Africa
This study found that average teenage pregnancy rate in Africa for the first decade of the 21st century has been declining steadily in Africa with a rate of 109.44 per 1000 females in 2000 and 88.43 per 1000 females in year 2010. This finding contradicts previous evidence which indicates that teenage pregnancy remains high in Africa (Sedgh et al 2015; World Health Statistics, 2011; Mangiaterra et al. 2008).

Perhaps, this discrepancy is based on interpretation of statistical result as WHO (2011) review indicates that Africa has the highest teenage pregnancy rate amongst all continents. This view is further supported in a recent study by Sedgh et al (2015) where teenage pregnancy rate since the mid 1990s were evaluated in some Sub-Sahara Africa and reported to be much higher than the rate of the country with the uppermost rate.

This study also points out that there are wide disparities in teenage pregnancy rate across regions of Africa with North Africa and Central Africa being the region with the lowest and highest rate in Africa respectively. The finding from this study is Consistent with WHO (2004) report which indicates that there are wide variations in teenage pregnancy rate across the regions of Africa. However, this contradicts the World Health Statistics (2011) report which indicates that West Africa has the highest rate. This could be due to the manner the regions of Africa are classified, as most literature classifies other regions of Africa asides North Africa as sub-Saharan Africa while some studies merge Central and West Africa has a single region.

Impacts Of Various Social And Economic Factors

This study demonstrates that there are several social and economic factors associated with teenage pregnancy rate in Africa. Correlation analysis revealed that in countries with low literacy rate, contraceptive prevalence rate and life expectancy, the teenage pregnancy rate is high and in countries with high female labour participation rate, teenage pregnancy rate is also high.

This study found that as teenage pregnancy rate increases, life expectancy rate decreases. This finding is in accordance with Mayor (2004) study which indicates that a high percentage of teenage mothers die on a yearly basis as a result of complications and childbirth. Additionally, Dev-Raj (2010) makes clear that children born of teenage mothers are often unhealthy, as they are more likely to be low birth weight or premature babies, thus further reducing the life expectancy.

Furthermore in accordance with previous research, high teenage pregnancy rate is associated with low contraceptive prevalence in developing countries (Dev-Raj, 2010; WHO, 2012; Imamura, 2007; WHO 2004). Moreover, In line with findings from WHO (2004) and WHO (2012) reports, this research found that GDP per capita has a positive association with contraceptive prevalence rate. In essence, this research has demonstrated that in countries with high GDP per capita, there is good access to contraceptive services and better use of such facilities.

This study also found a positive relationship between GDP per capita and literacy rate. This is in line with Barro (1991) and Abel (2008) studies which points out that as literacy rate increases, economic activity within a country increases and this would eventually increase the GDP per capita.

Also, this study demonstrates that countries with high literacy rate would have high contraceptive prevalence rate. This supports Martin (1995) notion that education equips women with the knowledge to make effective reproductive choices. Besides, actions that can help improve contraceptive prevalence such as sex and relationship education are inadequate in developing countries (WHO, 2004).

In contrast with Gold et al (2001) study there was no significant relationship found between GDP per capita and teenage pregnancy rate. A possible explanation for this non-significant result is in accordance with findings from the World Bank (2010) synopsis which indicates that changes in teenage pregnancy rate cannot easily explain changes in GDP per capita, although, high GDP per capital is closely related to high teenage rate.

Unlike previous studies, there was no significant relationship found between teenage pregnancy rate and health care expenditure (WHO, 2004; Were, 2007; Gökçe, Ozsqahin, Zencir, 2007; Abdsselam, 2011). A possible explanation for this non-significant finding is that health care expenditure measures the amount spent by the government on the citizenry health and not specifically for women. However, given that this study has shown that the main predictor of teenage pregnancy rate is literacy rate, government expenditure on education and its association with teenage pregnancy rate can be explored in future research.

Similarly, unlike WHO (2012) report, there was no significant relationship between teenage pregnancy rate and gender equality rate in Africa. This could be due to the fact that the data sets for gender equality was not specific for women rather it represented both women and men equal access to education, healthcare services, the economy, and protection under law were measured.

Contrary to previous assumption made by Isaranurug, Mo-suwan and Choprapawon (2006) as well as Gökçe, Ozsqahin and Zencir (2007) but in accordance with Garenne, Tollman, Kahn (2000), this study indicates that there is a direct relationship between labour participation rate and teenage pregnancy rate in Africa. Furthermore, the finding from this study also reveals that there is an inverse relationship between the life expectancy rate and labour participation rate of females in Africa. Thus, as female labour participation increases, life expectancy decreases.

This contradicts previous assumptions which indicate that an increase labour participation rate will increase life expectancy given that females in good employment would be able to afford good health services (Kabir, 2008). Perhaps, this disparity is due to the female labour participation rate indirectly referring to women who are not full-time housewives but involved in some sort of unstructured or low paid employment or work that exposes women or girls to hazard such as agricultural hazards. Besides, the data sets did not provide information on the kind of employment the women were engaged in.

Also, the GINI index was contrary to the expected direction for this study, this could be due to the

format which the GINI index data was recorded. Besides, there were a lot of missing data for this particular variable as only 15 countries had data sets for GINI index.

Additionally, literacy rate emerge as the best predictor of the teenage pregnancy rate in Africa. This finding is in accordance with previous studies that indicate that low educational attainment appears to be the most significant determinant of teenage pregnancy (Were, 2007; Lemos 2009; Odejimi and Bellingham-Young, 2014). Thus, a focus on increasing female literacy rate by developing polices and strategies that supports female literacy rate will reduce teenage pregnancy rate in Africa.

One limitation of this research is the non-availability of other important social and economic factors such as: age at marriage of females, female occupational status and female income which could not be measured. Despite these limitations, this study has some significant strength. It is a large population-based study with national coverage of all countries in Africa and the findings from this study are representative of the continent. In addition, this study is unique in that it adds wealth of knowledge on the determinants of teenage pregnancy in Africa by exploring the impacts of several social and economic factors.
In conclusion, this study has found that the in the first decade of the 21st century, teenage pregnancy rate in Africa has being steadily declining, however, teenage pregnancy rate in Africa is higher in comparison with other continents. In addition, this study found that four social and economic factors are the determinants of teenage pregnancy with female literacy rate emerging as the major determinants.

This research is unique in that no other researcher has conducted a study of such depth in Africa. This research expands on earlier investigations of the determinants of teenage pregnancy in Africa while introducing additional social and economic factors. Likewise, this research uncovered potential explanations for the high teenage pregnancy rate in Africa when compared to other continents.
This research also produced evidence based recommendations for policy makers who wish to reduce the prevalence of teenage pregnancy in Africa, since policies and strategies that improves

female literacy rate will help reduce the teenage pregnancy rate in Africa.

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Appendix 1

REGIONS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NORTH	31.71	30.76	29.82	29.09	28.36	27.64	26.91	26.18	25.47	24.76	24.05
EAST	84.74	83.25	81.75	79.87	77.98	76.09	74.21	72.32	70.85	69.37	67.89
WEST	131.48	129.58	127.67	125.87	124.08	122.28	120.48	118.69	115.56	112.43	109.31
CENTRAL	152.84	151.08	149.31	146.07	142.83	139.59	136.36	133.12	130.23	127.34	124.45
SOUTH	114.19	113.88	113.57	110.25	106.93	103.61	100.29	96.97	94.27	91.58	88.88

Table 1: mean teenage pregnancy rate by region