

**Title**

Poverty-An Explanation for Teenage Pregnancy in South Africa?

**Authors**

Sibusiso Mkwanaenzi\*

**Affiliations**

\*Demography and Population Studies Programme, University of the Witwatersrand

Address: P.O Box 2050, Wits 2000

Telephone: 011 717 4342

Email Address: busi.mkwanaenzi.dps@gmail.com

**Correspondence Person:**

Sibusiso Mkwanaenzi

Email Address: busi.mkwanaenzi.dps@gmail.com

**ABSTRACT:**

Teenage pregnancy (TP) remains an important health issue the world over with 11% of births from 15-19 year old females. In South Africa, 30% of 19 year old females were ever pregnant in 2013. Previous research has investigated individual-level characteristics yet few studies have examined the environments of young women. Additionally, local studies failed to examine the influence of poverty on TP quantitatively. This study examined the possible association of poverty and TP. Using general household surveys of 2011-2013, females aged 10-19 years were included: 25492 girls. Poverty measures included: household and community-levels of poverty, home ownership and household head employment. Pregnancy was modeled through multilevel logistic regression. Four percent of teenage females were pregnant. Household- and community-levels of poverty were independently associated with TP. The study shows empirical evidence of the construction of TP in poor South African households and communities. Poverty-alleviation is needed to decrease TP in South Africa.

**Key Words:** Teenage pregnancy, poverty, contextual effect, South Africa

## **Introduction**

Teenage pregnancy has been widely researched over time by academics from numerous disciplines (Macleod, 2011;United Nations Population Fund, 2013). Nevertheless, the phenomenon remains a challenge to the progression as well as sexual and reproductive health of young women globally. In 2014, 16 million girls below the age of 20 were reported to have been pregnant while 11% of all births were due to teens between 15 and 19 years old (World Health Organization, 2014). The highest prevalence occurs in sub-Saharan Africa with an adolescent birth rate of 101 births per 1000 women aged 15 to 19 years (Loaiza and Liang, 2013).

In South Africa, the birth rate amongst adolescents is approximately 50 births per 1000 women and previous studies have reported as many as 24% of sexually active teenage females to have ever been pregnant (Loaiza and Liang, 2013;Macleod, 2011;Reddy et al., 2010). Consequently, teenage pregnancy is a critical issue in South Africa. In response government and NGOs have ensured access to contraception as well as criminalized marriage and sexual activity amongst minors. Unfortunately, these efforts have had little effect and the consequences of teenage pregnancy remain rampant within South African society. In particular, numerous obstetric, health and social consequences are associated with teenage pregnancy for mother, child and the wider society. These include fistulae, eclampsia, post-partum haemorrhage, sepsis, epistotomy and pregnancy induced hypertension that could all lead to maternal mortality (Macleod and Tracey, 2010;Mangiaterra et al., 2008;Tsui et al., 2007;World Health Organization, 2014). Additionally, stillbirths and neonatal deaths are more likely among teenage mothers compared to older mothers as are congenital malformations and other birth complications (Mangiaterra et al., 2008;World Health Organization, 2014). Finally, the potential for such women and their children to ever flourish in life is greatly decreased due to the perseverance of poverty and social exclusion. Consequently, teenage pregnancy prevention has benefits for the society at large as delaying pregnancy beyond the teenage years improves female educational attainment (Xu and Shtarkshall, 2004). This in turn raises community knowledge, skills, employment prospects and the chance for a productive life all culminating to the development of a country (Clifton and Hervish, 2013;Mangiaterra et al., 2008;World Health Organization, 2014). To this end, continued efforts to prevent teenage pregnancy are vital and numerous studies have been conducted to establish the main predictors of this phenomenon as a means to obtaining a solution.

Studies focusing on individual characteristics found increasing age, low education levels and low socio-economic status as significant predictors while those looking at household factors have found household size and household socio-economic status as consistent predictors of teenage pregnancy (Panday and UNICEF, 2009; Timæus and Moultrie, 2012; Vundule et al., 2001; Willan, 2013). Finally, a study commissioned by government in Limpopo found culture, gender inequality and gender stereotyping to be significant community level predictors of teenage pregnancy (Limpopo Pop. & Dev. Directorate, 2012).

However, great disparities in teenage pregnancy based on location exist in South Africa with lower levels of zero to five percent occurring in affluent areas as opposed to levels as high as 60-80% of teenage females having ever been pregnant occurring in deprived areas (IRIN Africa, 2007; Macleod and Tracey, 2009). This suggests reasons beyond the individual level predisposing young women to higher levels of risk in certain areas. Closely related to teenage pregnancy are variations in violence and crime based on location with elements of social disorganisation shown to explain this (Elliot and Merrill, 1961; Kubrin, 2009). At community level South Africa exhibits social disorganisation and unemployment ranging above 30% depending on location, poverty, ethnic heterogeneity, residential mobility as well as mass urbanisation (Kingdon and Knight, 2004; Klasen and Woolard, 2009). Consequently, it is possible that social disorganisation, particularly poverty, may influence teenage pregnancy as it influences crime in South Africa.

Previous studies have failed to comprehensively investigate the effect of poverty on pregnancy amongst young females. Specifically, socio-economic status at individual and household levels has been formerly used. This variable is usually determined through acquired income yet income is prone to being misreported as well as under-reported for numerous reasons (Greenberg and Halsey, 1983; Hurst et al., 2014). Additionally, socio-economic status may not be the best measurement of poverty as it only depicts half of one's financial status. Therefore, it becomes necessary to test the effects of a number of possible poverty proxies on teenage pregnancy. This would also assist in the establishment of teenage pregnancy's most appropriate and predictive variables indicative of poverty. The broad objective of this study was to determine the effect of poverty on teenage pregnancy in South Africa in order to test the following null hypothesis: There is no relationship between poverty and teenage pregnancy. This was addressed through the use of the theoretical framework depicted in section two, which then guided the methods in section three, followed by the results in section four and discussion and conclusions in sections five and six respectively.

## **Theoretical Framework**

The study will use an adaptation of the social disorganisation theory to explain teenage pregnancy as it has already successfully been adapted and used to study violence, educational behaviour of adolescents and child sexual abuse (Bowen et al., 2002, McNulty and Bellair, 2003, Tolan et al., 2003, Yahaya et al., 2013). The social disorganisation theory was developed by Shaw and McKay in 1942 and is classically used to explain the levels of crime in different contexts (Kubrin, 2009, Shaw and McKay, 1942). The theory states that crime is not randomly distributed occurring equally in all areas, but occurs more frequently in 'bad' neighbourhoods than in 'good' neighbourhoods (Kubrin, 2009). Therefore, the theory links the levels of crime in an area directly to the levels of poverty, ethnic heterogeneity, residential mobility, family disruption and urbanization in that same area. Closely related to this: Disparities in teenage pregnancy based on location exist in South Africa with lower levels of zero to five percent occurring in affluent areas as opposed to levels as high as 60-80% of teenage females having ever been pregnant in deprived areas (IRIN Africa, 2007, Macleod and Tracey, 2009). This suggests reasons beyond the individual level predisposing young women to higher levels of risk in certain areas. Therefore, it may be possible that social disadvantage influences teenage pregnancy as it influences crime.

For the purposes of this paper, we specifically concentrated on the aspect of poverty levels in an area. The variables of interest included household and community-levels of poverty, home ownership and household head employment. Controlling variables at the individual level were age, race, marital status, place of residence, education attainment, race, province, employment status and province. Those at household level were household sex composition and household head type. From the foregoing theory we would expect the likelihood of teenage pregnancy to be associated directly and indirectly with the demographic and socio-economic characteristics at the individual, household and community levels as well as directly with poverty and home ownership at the household and community levels as well as with household head employment status. In particular, the likelihood of teenage pregnancy may be higher among individuals living in households with poverty due to lower levels of access to other reproductive health services. On the contrary, the likelihood of teenage pregnancy may be lower among individuals living in communities with low levels of poverty due to there being a higher level of recreational centers, parks and activities with subsequent less time for sexual experimentation by teenagers within households and across households in such communities.

## **Data and Methods**

Data sources used in this study were the revised general household surveys (GHS) of 2011, 2012 and 2013. The general household survey has been conducted by Statistics South Africa (Stats SA) since 2002. It is a cross-sectional, nationally representative household-based survey to determine the levels of development and service delivery nationally. The GHS covered a representative national sample of 25,086 households in 2011, 25,330 households in 2012 and 25,786 households in 2013. Particularly, the revised surveys were adjusted to account for the change in the population model revision subsequent to the 2011 census findings as well as provincial boundaries that came in effect in the same year. Thus, the data across the three years are void of inconsistencies across time and between household and person-level data making them effectively comparable. The survey sample included individuals ranging from zero to 113 years old. However, this paper's study population encompassed 25,492 young females aged 10 to 19 years: 9351 from 2011, 8832 from 2012 and 7309 from 2013. Ethical approval to collect data from survey participants was obtained before commencement by Statistics South Africa. The study used secondary data where all details of participants were anonymised and replaced by a unique identity number to ensure confidentiality. The study included 24 499 young females who were not pregnant constituting 96% of the total sample, while 993 girls were pregnant. This represented 13,147,239 female adolescents who were not pregnant and 517,939 pregnant teenage girls between the years 2011 and 2013 in South Africa.

### **Measures**

#### **Teenage Pregnancy in the past 12 Months**

A single measure for teenage pregnancy was used. In this paper teenage pregnancy is defined as pregnancy occurring below the age of 20 years. Individuals were allowed to self-report if female and were also allowed to report on behalf of other females within the same household "any female household member who had been pregnant during the past 12 months". This was to make the question less threatening and more general in order to capture pregnancy in sensitive cases e.g. for young girls within the household. Individuals' options to this item encompassed Yes, No, Do not know, Not applicable (for males) and Unspecified. Female household members who answered yes or who were identified by other household members from the above question and whose age was below 20 were classified as pregnant teenagers. Conversely, those that answered no and were not identified to have been pregnant by others yet whose age was below 20 and above 10 were teenage females who were not pregnant. Teenage pregnancy was coded as 1 and teenage non-pregnancy as 0.

Independent variables were either variables of interest or controlling variables. Variables of interest included:

*Household and Community Poverty:*

*Household poverty:* households with an average income per individual below the upper-bound poverty line of R779

*Community-level of Poverty:* community percentage of poor households aggregated from household-level data and sub-divided into three tertiles to categorise the community percentages as low, medium and high.

*Home ownership:* households owned by the head of the household

*Community-level of Home ownership:* community percentage of households owned by the head of the households aggregated from household-level data and sub-divided into three tertiles to categorise the community percentages as low, medium and high.

*Household Head Employment Status:* employment status of the head of the household

The individual-level background variables were age, race, marital status, place of residence, employment status and province

*Age:* completed years at last birthday

*Race:* population group Black, White, Coloured, Indian/Asian

*Marital status:* collapsed into two possible options of never married and ever married or currently cohabiting.

*Place of residence:* defined as either urban or rural

*Employment status:* defined as either employed or unemployed

*Province:* Gauteng, Eastern Cape, North West, Northern Cape, Western Cape, Kwa-Zulu Natal, Mpumalanga, Free State, Limpopo

Background factors at household-level included household sex composition and household head type.

*Household sex composition:* aggregated from individual-level data of all household occupants. Five possible categories presented viz. only females, predominantly females with males, evenly mixed, predominantly males with females and only males.

*Household head type:* categorization of the household head by sex and age. Three possible categories presented viz. male adult, female adult and minor

Analysis

The study first described the entire study sample across the years and then by individual year to demonstrate possible fluctuations in the outcome and interest variables. Rates and percentages of component parameters were calculated to accomplish this through the following equations:

$$\text{Teenage Pregnancy Rate} = \frac{\text{Number of Pregnant Teenagers}}{\text{Total Number of Female Adolescents (10–19 years)}} \times 1000 \dots \dots \dots (1)$$

$$\text{Percentage} = \frac{\text{Number of Households with phenomenon } x}{\text{Total Households}} \times 100 \dots \dots \dots (2)$$

Annual rates were calculated for the teenage pregnancy rate and produced using 2011 to 2013 national population estimates of female adolescents. Percentages were used to show the overall and yearly levels of divorce and single female headedness. Changes across time were tested for significance using the chi-squared test as well as the chi-squared test for trend. The background characteristics of all pregnant teenagers were then described as well as the levels of the interest variable phenomena amongst them. These bivariate relations were statistically verified through the chi-squared test. The above descriptive statistics were generated using STATA version 13.

The paper considered teenage pregnancy, a dichotomous outcome with possible responses of ‘yes’ or ‘no’, through the use of regression. Multilevel binary logistic regression models with random intercepts tested the independent association between poverty and teenage pregnancy. Models were run to test the heterogeneity of teenage pregnancy in different communities as well as to establish the association between poverty and teenage pregnancy controlling for socio-demographic individual-, household- and community-level variables. Multilevel modelling is a suitable statistical technique when individuals from the same households or geographical areas have the potential of being included in a study sample (Goldstein, 2011). This indeed is the case for the general household survey as households from the primary sampling units (provinces) were sampled using systematic sampling, but every member within the household was interviewed. Therefore, the two-level model established the variation between individuals and individuals within the same communities in the risk of teenage pregnancy. Simple logistic regression would fail to capture this accurately as members within households are similar thereby violating the logistic regression assumption of independence of residuals (Kawachi and Subramanian, 2007, Merlo, 2003, Subramanian, 2004). This would result in underestimation of standard errors and very small p-values, making estimates of association appear falsely significant. Representation of the model follows:

$$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \delta_{0ij} + \sum_{ij=1}^{\omega} \delta_{ij} z_{ij} + \varepsilon_{ij} \dots \dots \dots (3)$$

Where:  $\pi_{ij}$ =probability of having been recently pregnant for the  $i^{\text{th}}$  individual in the  $j^{\text{th}}$  community –the dependent variable

$\delta_{ij}$  are the parameter coefficients of the model  $z_{ij}$  are the independent regressors  $\epsilon_{ij}$  are the residual errors

## Preliminary Results

### Descriptive Outcome

Teenage pregnancy was present over all three years with 3.4%, 3.8% and 4.7% of teenage females respectively being pregnant nationally from 2011 to 2013. The teenage pregnancy rate also escalated over time with that of 2011 at 31,87 pregnancies per 1000 teenage females, 2012 at 32,82 pregnancies per 1000 teenage females and 2013 at 36,53 pregnancies per 1000 teenage females. This would represent the annual incidence rate of teenage pregnancy in South Africa. Chi-squared test results revealed teenage pregnancy was statistically significantly increasing over time with a p-value of 0.000. The chi-squared test for linear trend was significant with a p-value of 0.000. Therefore, there was a linear trend of teenage pregnancy from 2011 to 2013. This confirmed that teenage pregnancy had increased linearly over time.

Table 1: Distribution of study participants across various demographic factors (GHS, 2011-2013)

Characteristics	2011	2012	2013
Pregnant in Past Year	3.4%	3.8%	4.7%
Age median, IQR	15;5	15;5	16; 4
Ever Married	1.5%	1.7%	2%
Not Attending School (%)	12.9	13.3	15.4
Rural Residence (%)	48.8	47.8	47.8
Living with Females only (%)	10.9	11.4	11.6

Figures 1-5: Distribution of study participants across Household-level and community-levels of poverty (GHS,2011-2013)

Figure 1: Levels of Poverty among households

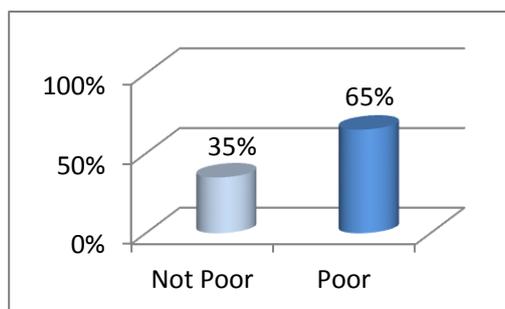
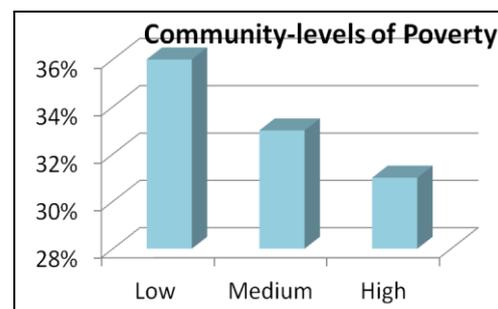


Figure 2: Community-levels of Poverty



The majority of the study participants were from poor households at 65% while only a few teenage females were from households without poverty. Additionally, the greatest proportion of study participants originated from communities with low levels of poverty at almost 36% while approximately 30% of teenage females were from communities with high levels of poverty.

Figure 3: Home ownership levels

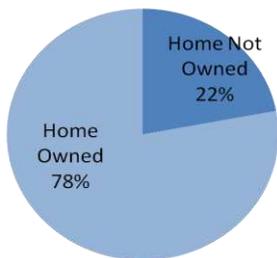
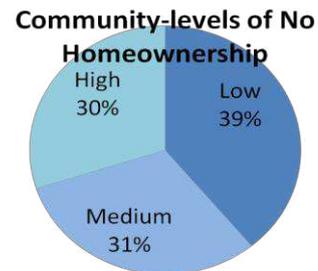


Figure 4: Community-levels of No Home ownership



Similarly figures three and four show the levels of home ownership amongst the study participants across all three years. Most teenage females were from homes that were owned by the household head at 78%. At community-level, most teenage females were from communities with low levels of no home ownership at 39% while about three in ten girls were from communities with high levels of no home ownership.

Figure 5: Household Head Employment Status

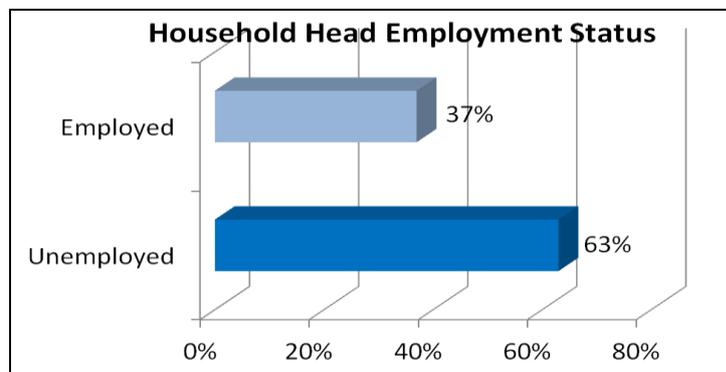


Figure five shows that most study participants were from households where the head was unemployed at 63% while only 37% of the teenage girls were from households with heads that were employed.

Table 2: Distribution of pregnancy across demographic and poverty factors (GHS, 2011-2013)

CHARACTERISTICS	Pregnant	P-value
Age Group: 15-19 yr. olds	6.86%	0.00
Ever Married	29.66%	0.00
Not Attending School (%)	17.70%	0.00
Black	4.22%	0.00
Employed	7.45%	0.00
Predominantly Males with Females in HH	5.27%	0.00
Female Adult Head of HH	4.31%	0.00
Rural Residence	4.56%	0.00
North West Province	4.83%	0.00
Household Poverty	4.61%	0.00
Lack of Home Ownership	4.26%	0.00
Household Head Unemployment	4.22%	0.00
High Community-level of Poverty	4.48%	0.00
High Community-level of No Home ownership	4.29%	0.00

The results from the bivariate analysis are shown in Table 2. The categories with the highest levels of pregnancy among the teenage females were tabulated. From the table we can see that teenage pregnancy occurred more among teenage girls that were older, ever married, not attending school, black and employed. Additionally, teenage females from poor households, households comprising males predominantly with some females and with female adults as heads as well as households with heads that were unemployed had the highest levels of pregnancy. Finally, teenage females from rural areas, the North West province and communities with high levels of poverty and no home ownership displayed the highest levels of teenage pregnancy.

## Inferential Outcome

The random-intercept multilevel logistic regression results are shown below in Table 3.

Table 3: Unadjusted and Adjusted Multilevel Logistic Regression (GHS, 2011-2013)

<b>Poverty-related Characteristics</b>	<b>Model 0</b>	<b>Model 1</b>
Household Poverty	1.79***	1.57***
Lack of Home ownership	1.18**	1.08
Household Head Unemployment	1.22***	1.01
Medium Community Poverty	1.17	1.08
High Community Poverty	1.36***	1.13**
Medium Community No Homeownership	1.11	1.08
High Community No Home ownership	1.16	1.01

The results of the bivariate analysis are shown in Model 0 while Model 1 shows the multivariate analysis controlling for all other variables. Table 3 shows that association between household poverty, lack of home ownership at household level, household head unemployment and high community-levels of poverty were associated with teenage pregnancy at the bivariate stage of analysis. However, having controlled for all other factors, the only factors independently associated with teenage pregnancy were household poverty and high community levels of poverty.

## **Discussion**

This study aimed to investigate the association between poverty and teenage pregnancy in South Africa. In answering the question posed in the title of this study, the preliminary results have shown that: Yes, poverty is a possible explanation for teenage pregnancy in South Africa. In particular, the results showed that the direct measure for poverty was associated and more important than homeownership and household head employment status. Possible reasons for the lack of independent association for home ownership included the high levels of home ownership though in different settings. Home ownership may classically proxy socio-economic status as this should increase as one's ability to buy a home increases. However, in the South African setting, home ownership occurred in states of low and high socio-economic status due to the ability of individuals to purchase homes (that may possibly be mud rondavels) in rural areas, four roomed houses in high density townships as well as four bedroomed houses in urban suburbs. Despite all these homes being different, they were still owned by the head of the household thereby distorting the variable.

Household and high community levels of poverty both increased the likelihood of teenage pregnancy. Possible reasons for this include the fact that poverty is related to lower levels of education, lower access to contraceptives, fewer options of protective activities (sport, curricular activities, interests, hobbies) and higher levels of social ills.

This study shows empirical evidence of the construction of teenage pregnancy in South Africa in households and communities that experience higher levels of poverty. Therefore, it is recommended that policies to ensure poverty-alleviation and higher levels of adult education, employability and job opportunities are urgently needed. These will not only increase levels of economic growth, but also decrease teenage pregnancy in South Africa.

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