

**PAA Abstract and extended Abstract:**  
**102: Adolescent Sexual and Reproductive Health**  
**103: Adolescent Fertility and Contraceptive Use**

**Contextual Determinants of Adolescent Pregnancy in Urban Slum Areas of Nigeria: A multilevel analysis**

**Akanni Akinyemi, Temitope Erinfolami and Iqbal Shah**

**Abstract (150 words)**

In Nigeria, about one-fifth of adolescent girls have already begun childbearing. We investigate contextual determinants of the pregnancy experiences of childbearing adolescents in selected slum areas in Nigeria. The desire for first pregnancy increases with age-at-first-marriage [OR:1.23 CI:1.01, 1.49] and among Muslims [OR:1.47 CI:1.01,2.13], while never-married [OR:0.20 CI: 0.13, 0.31] or having at least one older sibling who had a birth at teenage [OR:0.58 CI:0.37, 0.91] significantly reduces the likelihood of desire for the first pregnancy during adolescence. Also, having only mother alive reduces the likelihood of seeking antenatal services [OR:0.70 CI: 0.52, 0.96] while the loss of both parents reduces antenatal attendance [OR: 0.46 CI: 0.32, 0.67]. Older age at first pregnancy significantly increases the chances of benefiting from support networks [OR: 2.15 I:-1.04, 4.45]. Communities with majority of Muslims [OR:3.87-CI:1.34, 11.18] significantly more likely to experience financial vulnerability. Program aimed at improving the lives of childbearing adolescents should involve family and community.

## Extended Abstract

### Background

Adolescent pregnancy is a leading global public health, reproductive, maternal and health challenge with the greatest burden in West and Central Africa. Little progress has been made with regards to reducing adolescent childbearing and the problem had even grown worse in West and Central Africa where 6 per cent of adolescents reported births before age 15 and 28 per cent of women aged 20 to 24 reported a birth before age 18 (1,2). In Nigeria, about a fifth of adolescent girls have begun childbearing and the adolescent fertility rate is 123 births per 1,000 adolescent girls aged 15-19. Half of these pregnancies are among teenage girls with no education, about 43 per cent among the poorest (1). Unmet need for contraception was estimated at 35 per cent among unmarried adolescents (15-19 years) and 13 percent among married adolescents (1). The consequences of early childbearing especially the unintended ones are reflected in high risks for maternal and newborn health and survival, intergenerational poverty, poor life skills (3,4), and limited opportunities for both the mothers and children (4). Childbearing adolescents have poor maternal health care service utilization and they generally lack basic knowledge and experience about enhanced parenting skills and livelihood (5,6).

Despite these challenges, there is no evidence yet on the experiences of adolescent mothers through pregnancy, particularly for the most vulnerable in urban slums. Spatial categorization suggests that an individual's geographical location and social boundaries are important determinants of behavior and health outcomes (7–10). There is a growing evidence on the linkages between environment and health outcomes (11,12). Studies have clearly shown that slum dwellers differ significantly from other urban dwellers in their sexual and reproductive behavior (12–14). However, there is little or no attention devoted to this vulnerable group of people. Adolescents within this environment are more vulnerable to poor sexual and reproductive health outcomes and it can be worse for those who are pregnant or have started childbearing. The analysis utilized a socio-ecological perspective based on Bronfenbrenner's ecological model in identifying the challenges of childbearing adolescents in urban slums, the determinants of the challenging experiences with a view to ensuring improved reproductive health care for childbearing adolescents in urban slums. This is significant on its timeliness in addressing the associated risks of adolescent pregnancy and childbearing in resource constrained societies, and towards attaining SDG3 and SDG5.6.

The conceptual framework was based on the socio-ecological model of behaviour which recognizes that childbearing adolescent experiences are influenced by factors at multiple levels of individual, family and community. Studies have identified the likely experiences of adolescents during pregnancy. The status of pregnancy may be problematic and depressing for some (15–19), while it may be pleasing to others (20). Antenatal care is a critical intervention for improving adolescent mother's health and that of the child (18). Hofferth (21) identified availability of support network in mentoring and guiding adolescent mothers during pregnancy as a very important experience to teen age mothers. Financial vulnerability caused by the adolescent pregnancy was identified as a serious issue for pregnant adolescent girls in Ghana (22). These four outcomes (status of pregnancy, accessing antenatal care, availing support network and financial vulnerability) were identified in this study as the outcome variables of interest.

The choice of explanatory variables at the individual, family and community levels were guided by extant literature. Studies have shown the importance of individual level variables (20,23) and family level variables on the likelihood of depression, smoking and other experiences among pregnant adolescents (19,24,25). Community level variables such religion, educational levels of mothers have also been identified as important determinant of teenage experiences during pregnancy (26).

## Methodology<sup>1</sup>

The study utilized data collected from a survey of young women in Lagos and Ibadan who are teenage mothers or had been pregnant at a teen age. Ethical approval of the study was obtained from the Nigeria Health Research Ethics Committee (NHREC). The survey used a three-stage sampling design with random selection of clusters and households within each cluster and finally eligible women in the household. The survey was conducted between June and July 2018. This analysis is restricted to a sample of 1,669 women clustered in 86 communities in the two states. The outcome of interest is the experience of pregnancy during adolescence. The outcome measures of interest include experience of first pregnancy as problematic or not, whether they attended antenatal care, whether any network of support was available to them and whether they were financially vulnerable during the first pregnancy. Explanatory variables at the individual level include: age at first sex, age at first pregnancy, being a Muslim, use of any method of FP at first sex and use of a modern FP method at first sex. Family level variable were also considered. These includes whether parents were alive or dead, Parents' education, Polygamous background and whether any of their sibling gave birth at teen age. Finally, community-level variables include community education, community polygamy, community Muslim, community average age at first sex and community average age at first pregnancy. All variables are described in details in table 1 below:

<b><u>Table 1: Definition of variables</u></b>	
<b>Variable</b>	<b>Description</b>
<b><u>Individual level variables</u></b>	
Age at first sex	Age when respondent first had sex (numeric)
Age at first pregnancy	Age when respondent first got pregnant (numeric)
Muslim	Muslim respondents (No=0, Yes=1)
Used any method of FP at first sex	Those who used any method of FP to prevent pregnancy at first sex (No=0, Yes=1)
used modern FP method at first sex	Those who specifically used modern method of FP to prevent pregnancy at first sex (No=0, Yes=1)
Never Married	Proportion never married
<b><u>Family level variables</u></b>	
Parents alive	A measure of whether: Both parents alive=1; Only father alive=2; Only mother alive=3, both parents dead=4
Father's education	A measure of whether father has a post-primary education (No=0, Yes=1)
Mother's education	A measure of whether mother has a post-primary education (No=0, Yes=1)
Polygamous background	Those whose fathers are married to 2 or more wives (No=0, Yes=1)
Any sibling gave birth at teen age	Those with at least one sibling who gave birth at a teen age (No=0, Yes=1)
<b><u>Community Level Variables</u></b>	

<sup>1</sup> The study was implemented in three states- Oyo, Lagos and Kaduna. However, fieldwork is still on-going in Kaduna, hence the preliminary analysis was based on Lagos and Oyo. We intend to include Kaduna once the dataset is available.

Community education	Proportion with more than primary education in the community
Community polygamy	Proportion from polygamous background in the community
Community Muslim	Proportion of Muslims in the community
<b><u>Outcome Variable</u></b>	
First pregnancy was wanted	A measure showing that first pregnancy was “not sudden” or “unexpected” (No=0, Yes=1)
Attended antenatal	A measure of those who visited a skilled healthcare provider for antenatal services (No=0, Yes=1)
Had network of support	Those who had network of support during pregnancy at different times (e.g. complications) (No=0, Yes=1)
Financially vulnerable	Proportion who were not able to meet unexpected financial needs or who found it hard to meet it (No=0, Yes=1)

Because of the clustering of respondents within neighborhoods, we utilized a mixed-effect logistics regression to examine the predictive values of all explanatory variables on each of the pregnancy period experiences. Specifically, a two-level structure was utilized whereby young women (level-1) were nested in communities (level-2) and two-level random intercept models were fitted.

Results are presented in five models. Model I fits the effects of explanatory variables on desire for first pregnancy. Antenatal visits, having a network of support and financially vulnerable were the outcomes in Models II, III and IV respectively. Finally, model 5 fits the effect of the explanatory variables on all the poor experiences combined. i.e. not desiring the first pregnancy, not attending antenatal, not having a network of support and being financially vulnerable. The score for the total poor experiences ranges from 0 to 4 with 0 reflecting no negative experiences and 4 reflecting severe negative experiences during first pregnancy. A mixed-effect ordered logistics regression was used to examine the predictive values of explanatory variables on the score of the experiences in model 5.

#### **Means and Proportions of variables**

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Individual-Level</b>					
Age at first sex	1,669	17.02	1.48	8	19
Age at first pregnancy	1,669	17.64	1.26	13	19
Muslim	1,669	0.56	0.50	0	1
Used any method of FP at first sex	1,669	0.10	0.31	0	1
Used modern FP method at first sex	1,669	0.08	0.27	0	1
Never married	1,669	0.36	0.48	0	1
<b>Family-Level</b>					
Parents Alive					
Both alive	1,669	0.62	0.48	0	1
Only father alive	1,669	0.08	0.27	0	1
Only mother alive	1,669	0.19	0.39	0	1
Both dead	1,669	0.11	0.31	0	1
Father has post primary education	1,669	0.70	0.46	0	1
Mother has post primary education	1,669	0.59	0.49	0	1
Polygamous background	1,669	0.36	0.48	0	1
Any sibling gave birth at teen age	1,669	0.18	0.39	0	1

<b>Outcome Variables</b>					
Think first pregnancy is not a big problem	1,669	0.15	0.36	0	1
Attended antenatal	1,669	0.63	0.48	0	1
Had network of support	1,669	0.33	0.47	0	1
Financially vulnerable	1,669	0.30	0.46	0	1
Total Score	1,669	1.94	0.88	0	4

	<b>Model 1; Panel 1</b> <b>OR [95% CI]</b>	<b>Model 2; Panel 2</b> <b>OR [95% CI]</b>	<b>Model 3; Panel 3</b> <b>OR [95% CI]</b>	<b>Model 4; Panel 4</b> <b>OR [95% CI]</b>	<b>Model 5; Panel 5</b> <b>OR [95% CI]</b>
	<b>First pregnancy</b> <b>desired</b>	<b>Antenatal visit</b>	<b>Support network</b>	<b>Financially</b> <b>vulnerable</b>	<b>All combined</b>
<b>Fixed Effects</b>					
<b>Individual Level</b>					
Age at first sex	0.95 [0.81, 1.12]	1.08 [0.97, 1.21]	1.00 [0.88, 1.12]	0.97 [0.86, 1.09]	0.98 [0.89, 1.08]
Age at first pregnancy	1.23* [1.01, 1.49]	1.06 [0.93, 1.21]	1.14 [0.98, 1.31]	0.94 [0.82, 1.08]	0.91 [0.81, 1.02]
Muslim	1.47* [1.01, 2.13]	0.92 [0.71, 1.18]	0.92 [0.69, 1.21]	0.82 [0.62, 1.07]	0.88 [0.71, 1.10]
Used any method of FP at first sex	1.09 [0.44, 2.67]	1.74 [0.88, 3.46]	1.22 [0.62, 2.41]	1.48 [0.78, 2.80]	0.89 [0.52, 1.54]
Used modern FP method at first sex	1.16 [0.42, 3.21]	0.55 [0.25, 1.19]	1.10 [0.50, 2.42]	0.75 [0.35, 1.57]	1.14 [0.60, 2.16]
Never married	0.20*** [0.13, 0.31]	0.53*** [0.42, 0.66]	0.64*** [0.49, 0.83]	1.85*** [1.43, 2.38]	2.21*** [1.79, 2.73]
<b>Family-Level</b>					
Parents alive (RC= Both dead)	1	1	1	1	1
Only father alive	1.04 [0.57, 1.93]	0.76 [0.50, 1.16]	0.81 [0.51, 1.30]	1.68* [1.08, 2.62]	1.48* [1.03, 2.13]
Only mother alive	0.97 [0.62, 1.52]	0.70* [0.52, 0.96]	0.94 [0.67, 1.32]	0.94 [0.67, 1.32]	1.08 [0.82, 1.42]
Both dead	1.04 [0.59, 1.85]	0.44*** [0.30, 0.63]	0.72 [0.46, 1.13]	1.60* [1.07, 2.39]	1.44* [1.03, 2.01]
Father has post primary education	0.90 [0.60, 1.36]	1.30 [0.97, 1.75]	1.01 [0.73, 1.39]	1.04 [0.76, 1.43]	1.00 [0.77, 1.29]
Mother has post primary education	0.70 [0.47, 1.02]	1.30 [0.99, 1.71]	0.96 [0.71, 1.29]	0.62** [0.46, 0.83]	0.92 [0.72, 1.17]
Polygamous background	0.84 [0.60, 1.17]	1.08 [0.84, 1.37]	0.90 [0.69, 1.18]	1.03 [0.80, 1.33]	1.10 [0.89, 1.35]
Any sibling gave birth at teen age	0.58* [0.37, 0.91]	0.94 [0.71, 1.25]	1.00 [0.73, 1.37]	1.24 [0.92, 1.67]	1.22 [0.95, 1.56]
<b>Community-Level</b>					
Community education	1.89 [0.17, 21.57]	4.47 [0.97, 20.54]	1.16 [0.10, 13.06]	0.81 [0.11, 6.05]	0.91 [0.15, 5.54]
Community polygamy	3.78 [0.94, 15.21]	1.67 [0.66, 4.21]	0.58 [0.14, 2.32]	1.38 [0.41, 4.61]	0.93 [0.31, 2.74]
Community Muslim	1.30 [0.36, 4.64]	0.74 [0.33, 1.63]	2.40 [0.69, 8.34]	3.87* [1.34, 11.18]	0.87 [0.34, 2.24]
Intercept	0.59 [0.00, 840.44]	60.33 [0.45, 8,005.45]	0.00 [0.00, 2.53]	745.26 [0.93, 600,293.90]	-
<b>Random Effects</b>					
Variance (SE)	0.41 (0.15)	0.14 (0.07)	0.86 (0.23)	0.44 (0.14)	0.47 (0.11)
<b>Null Model</b>					
Null model Intercept	0.15*** [0.11, 0.19]	1.81*** [1.54, 2.12]	0.52*** [0.40, 0.68]	0.38*** [0.31, 0.46]	-
Null model variance (SE)	0.73 (0.20)	0.23 (0.08)	1.14 (0.28)	0.49 (0.15)	0.59 (0.13)

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Model 1 indicated the odds for the first pregnancy to be desired which significantly increases with age at first pregnancy [OR:1.23 CI:1.01, 1.49]. Furthermore, Muslim adolescents desired first pregnancy by 47% more than those of other religions [OR:1.47 CI:1.01, 2.13]. On the other hand, being never married [OR: 0.20 CI: 0.13, 0.31] and having at least one sibling who had given birth to a child at a teen age [OR:0.58 CI:0.37, 0.91] significantly reduces the odds that the first pregnancy is desired for girls who got pregnant in their teenage. A unit increase in the average age at first pregnancy however significantly reduces desire by 56% [OR:0.44 I: 0.22, 0.89].

Result further shows in model II that having only the mother alive reduces the likelihood of seeking antenatal services [OR: 0.70 CI: 0.52, 0.96] while the loss of both parents more significantly reduces antenatal attendance [OR: 0.44 CI: 0.30, 0.63]. More significantly, being never married has odds of 53% less to accessing antenatal care compared to being married.

Results shown in model III indicate never married adolescents have significantly lower chances of having networks of support during first pregnancy [OR: 0.64 CI: 0.49, 0.83].

In model IV, being never married [OR:1.85 CI:1.43, 2.38], having only father alive [OR: 1.68 CI: 1.08, 2.62], having lost both parents [OR: 1.60 CI: 1.07, 2.39] and increased proportion of Muslims in the community [OR: 3.87 CI:1.34, 11.18] all have statistically significant effects in increasing financial vulnerability. Almost similarly, results show in the final model that having only father alive [OR: 1.48 CI: 1.03, 2.13] or having lost both parents [OR: 1.44 CI: 1.03, 2.01] have almost the same statistically significant effect in exposing adolescents to more severe experiences at first pregnancy. In addition, never married teenage girls have higher odds of experiencing negative consequences (OR: 2.21 CI: 1.79, 2.73).

## **Discussion**

Older adolescents, as expected, desired the first pregnancy. However, having had a sibling who had a teenage pregnancy is associated with significantly lower odds for first pregnancy to be desired. This finding is contrary to the assumption that siblings follow a similar reproductive behavior path. In our study context, Muslims are significantly more pronatalist than those of other religious affiliation.

Across all models, marital status of teenage mothers is significantly related to higher odds for negative outcomes. Fewer desired the first pregnancy, fewer accessed antenatal services, less network support, higher financial vulnerability and overall higher negative consequences. As a priority, therefore, teenage pregnancy among never married deserve concerted efforts for prevention and management.

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