Educational Attainment and Fertility: Contextual Determinants in West Africa

Winfred A. Avogo

Abstract

Research from Western settings has established that women with more education have lower fertility. However, although fertility has declined after almost four decades of education policies and family planning programs, Sub-Saharan Africa (SSA) still has the highest fertility in the world and the pace of fertility decline is the slowest. Using data from the Demographic and Health Surveys from four countries in West Africa, we investigate the effect of average educational levels in the community and other community characteristics on adolescent cohabitation and marriage and first birth. Using decomposition analysis, we examine changes in educational attainment and adolescent reproductive transitions within the last two decades. We find that although average educational levels in the community matter, individual educational levels are consistently associated with the outcomes of interest. We interpret the results of our analysis in the context of policy debates on Sustainable Development Goals on education and fertility in SSA.

Extended Abstract

Introduction

Research has clearly established that women with more education have lower fertility (Caldwell 1980; Lloyd, Kaufman and Hewitt 2000; Kravdal 2002, Eloundou-Enyegue and Stokes 2004; Bongaarts 2010). Educated women are more motivated to avoid the opportunity cost of unwanted childbearing, have high contraceptive use, low desired family size preferences and overall autonomy over reproductive decision-making (Bongaarts 2010). These were the mechanisms Caldwell (1980) so hopefully predicted will be crucial in the timing of fertility decline in Sub-Saharan Africa (SSA). Although fertility has declined after almost four decades of education policies, family planning programs and international interventions to lower fertility in the region, SSA still has the highest fertility (4.6 births per woman) than anywhere else in the world (compared to a world average of 2.5) and the pace of fertility decline is substantially slower than other developing regions at the earlier stages of their development (UN 2019, Bongaarts 2013; Shapiro and Gebreselassie 2013).

Similarly, although world population is growing at slower pace, the population of SSA is projected to double by 2050 (UN 2019). Of the nine countries expected to contribute more than half of the projected increase in global population, four are in SSA (Nigeria, Democratic

Republic of Congo, Ethiopia and United Republic of Tanzania). The implications of these changes to the age structure of the region is that the working age population is larger in response to fertility decline, potentially creating opportunities for accelerated economic growth- the so call “demographic dividend”. Yet, persistent poverty in the region, civil-strife, staggering levels of youth unemployment etc. are preventing governments from investing in the health and education of young people thereby dwindling the prospects of a conventional fertility transition and the attainment of the demographic dividend.

The relationship between education and fertility in SSA is thus complex and least understood. In this paper, we draw from adolescent life course family development perspectives and community effects on adolescent transitions to examine (a) the effect of community characteristics cohabitation and marriage and first birth of adolescents, net of individual characteristics (b) Change over time in educational attainment and the local socio-economic context and its impact on cohabitation and marriage and first birth. We situate our study in Western Africa, the region with the highest fertility in the world. We interpret the results of our analysis in the context of policy debates on Sustainable Development Goals (SGDs), particularly goal 4 on education and 5 on gender equality in SSA and on the ongoing fertility transition in the region.

Data and Methods

Data is drawn from the Demographic and Health Surveys (DHS) of four countries in Western Africa – Nigeria, Niger, Burkina-Faso, and Ghana. These countries not only have some of the highest prevalence of child marriage but also the highest adolescent fertility in the region. In Niger, a country considered pre-transitional, overall total fertility rate (TFR) is 7.3 and adolescent fertility is about 206 per 1000. Nigeria and Burkina-Faso both have TFRs above 5 (5.5 in Nigeria and 5.7 in Burkina-Faso) and are considered at an earlier stage of the fertility transition. Ghana, however, has TFR of 4 is said to be experiencing a fertility stall at mid-transition (Shapiro and Gebreselassie, 2008). Thus, these four countries together provide an assessment of the education fertility- relationship and the context of the state of fertility transition in the region.

The DHS surveys used a two-stage sample design. In the first stage, stratified sampling techniques were used to select clusters as the primary sampling unit. The second stage involved a systematic sampling of households within each. The current samples of four countries are based on females aged 15-24, the age when women in SSA typically marry and have their first births. Since the sample is not self-weighting at the national and sub-sample levels, weighting factors (provided in the data) are used to produce results that are proportional at the national level and account for unequal probability of selection.

Variable Measurement

The key dependent outcome is the timing of first marriage and first birth. For this variable, women were asked the month and year of each of their first marriage and births and whether their child is still alive or not; starting with their first birth. Both variables were coded as time-varying for dynamic modeling using event history techniques.

We use two key independent variables; average community educational level and individual education. Stimulated by research that points to community effects of education on fertility (Kravdal 2002; Adedini et al. 2014), we include the percentage of educated women in the community to capture neighborhood effects. This variable was constructed by aggregating the individual and household level variables at the primary sampling unit (PSU) which served as a proxy for community level variables. To operationalize individual education, we take the number of years of completed education and group them into 0-1, 2-4, 5-7, and 8-10 and 11 or more. This captures various qualification and credentials. We also construct two additional neighborhood characteristics to reflect the socio-economic context – the percentage of poor women in the community and the percentage of working women in the community.

We include other covariates such as place of residence (urban or rural), region of residence, religion, and the wealth index of the household as well as the sex of the head of the household (which we include as a proxy for women's empowerment). All independent variables (apart from the timing of union formation and first birth) are fixed or time-invariant.

Statistical Model

Standard survival analyses and discrete-time logistical regression models are used. As indicated, the main dependent outcome of interest is whether a woman married before age 18 or had a first birth. The risk of union formation and childbearing begins at age 10. Women who did not experience a birth are censored at the year of interview. The duration of risk is measured in years and included as a covariate. The discrete-time model is based on person-year risk of the events and is estimated using a logistic function (Allison, 2010; Singer and Willett, 2003). The analysis are conducted in SAS using the GLIMMIX procedure to account for the sampling design and to produce adjusted estimates (odds ratios) and standard errors (Anthony, 2008). To study change over time in educational attainment and the local socio-economic context and its impact on age at first marriage and first birth, we use the Blinder-Oaxaca decomposition technique to decompose the differences between educated and non-educated girls as a function of (1) their characteristics (endowments) or (2) the effects of those characteristics (co-efficients). We justify the use of decomposition techniques to enable us compare two time periods for each of the countries.

Preliminary Results

On Table 1, we present preliminary analysis of the relationship between community variables, individual characteristics of the respondent and the probability of first birth. We can observe from the table that controlling for all variables, women who have secondary or higher education are less likely to have a first birth in all four countries.

In further analysis, we use decomposition analysis to examine changes in education and the probability of first birth and cohabitation and marriage in the region. This is needed to enable us to describe the magnitude of education on trends in childbirth from the late 1990s to the latest DHS survey in all four countries. This analysis will offer us insights into the context of policy debates on fertility in the region and how to speed up the attainment of the Sustainable Development Goals (SGDs) on education and gender equality as well as the on-going fertility transition in SSA.

Table 1: Odds Ratios of Discrete-time Logistic Regression Estimates of First childbearing Among Adolescents (15-24) in Nigeria, Burkina-Faso, Niger and Ghana

	Full Model			
Variables	**Nigeria**	**Burkina-Faso**	**Niger**	**Ghana**
Community-Level Variables				
% of women educated				
Low	1	1	1	1
Medium	1.22	0.972	0.715ǂ	1.131
High	1.43	0.687ǂ	1.015	1.226
% of poor women				
Low	1	1	1	1
Medium	1.428*	0.959	1.011	0.947
High	0.98	0.661	1.005	0.703
% of working women				
Low	1	1	1	1
Medium	1.288ǂ	1.227	1.068	0.885
High	1.551*	1.104	1.192	1.083
Respondent's Education				
None	1	1	1	1
Primary	1.106	1.082	0.671*	1.013
Secondary/higher	**0.489****	**0.59***	**0.306****	**0.482****
Wealth Index				
Poorest	1	1	1	1
Poorer	0.954ǂ	1.09	0.869	1.358
Middle	0.715*	1.038	1.144	0.99
Richer	0.627*	0.931	0.864	0.683
Richest	**0.384****	0.964	1.555	**0.373****
Religion				
Muslim	1	1	1	1
Christian	2.036**	1.628*		0.708ǂ
Region				
Northern	1	1	1	1
Southern	1.482*	0.643**	0.879	1.195
Sex of Household Health				
Male	1	1	1	1
Female	1.219ǂ	1.023	1.04	1.356*
Place of Residence				
Urban	1	1	1	1
Rural	1.335*	0.788	1.288	1.216
N (Person-Years)	127509	54620	28986	31283

*=p<0.05, **=p<0.01, ***=p<0.001

Results are based on latest DHS data in each country

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