Have fertility stalls among the most educated women contributed to non-declining fertility in sub-Saharan Africa?

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Abstract

Increased access to and improved quality of education is identified as one of the factors leading to the reduction of fertility levels; however, declines in fertility in sub-Saharan Africa has not followed increases in education. Halts and reversals in fertility decline have been found in many sub-Saharan African countries. Evidence suggests that disruptions in the progress of education might account for recent fertility stalls in several SSA countries. Our objective is to unravel the relationship between education and stalled fertility by analyzing the contribution of changes in female fertility by educational level to positive or non-declining changes in total fertility rates. Using the Demographic and Health Surveys, we first estimate fertility rates by educational level and examine how they have varied over time, especially during periods of stagnation. Then, we use a decomposition method to analyze changes in fertility rates. We discern the extent to which fertility stalls are related to reversals and halts in the fertility decline of more educated women, or whether there is fertility plateauing at all educational levels, or whether it is due to an effect of changes in the composition of the population. Our results suggest that halts and reversals in fertility decline among women with secondary and higher education account for stagnant fertility in countries with strong evidence of fertility stalls. Although we also find fertility plateaus among women with lower levels of education, these higher and non-declining fertility rates would not explain much of the stagnation in fertility at the national level.

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1 Background

Literature considers education to be one of the most relevant determinants of a country’s development and well-being, and one with the most lasting impact on society. Among its contributions, increased access to and improved quality of education is identified as one of the factors leading to the reduction of fertility levels. In sub-Saharan Africa (SSA), comparative studies show that having more and better educated women is linked to lower fertility (Kebede et al., 2019; Shapiro, 2010). Also, increasing female education is connected to periods of declining fertility (Agyei-Mensah & Owoo, 2015; Chemhaka & Odimegwu, 2019). Broadly, there are three transmission channels. First, the more education a woman has, the lower her demand for children (Hertrich, 2017; Shapiro, 2010; Shapiro & Tenikue, 2017). Second, more educated women have higher rates of contraceptive use, which decreases unplanned pregnancies and births (Bongaarts, 2017; Casterline, 2017). Third, education contributes to postpone childbearing by delaying sexual debut and marriage (Chemhaka & Odimegwu, 2019; Hertrich, 2017). One might think then that if there are no increases in a country’s education levels, its fertility transition could be affected.

Fertility in SSA began to decline in the early 1980s; however, it has done so at a slower pace than in other low- and middle-income regions. Moreover, reversals and halts in fertility decline have been observed since the 2000s (Bongaarts, 2008; Howse, 2015; Sánchez-Páez & Schoumaker, 2022; Schoumaker, 2019). As fertility
has stalled at rates well above replacement level, Africa’s demographic future has become uncertain and thus of renewed research interest.

Some scholars have studied the link between education and fertility stalls. Evidence suggests that disruptions in the progress of education may partly account for recent fertility stalls in several SSA countries (Bongaarts, 2006; Ezeh et al., 2009; Goujon et al., 2015; Kebede et al., 2019). Thus, periods of stalled fertility have followed periods of non-increasing schooling rates. In contrast, fertility stalls are less frequent in countries with no evidence of education disruptions.

Most of the analyses performed to date do not consider the fertility associated with each educational level, but rather analyze the effect on fertility based on the variation of schooling rates at the aggregate level. Our objective is to unravel the relationship between education and stalled fertility by analyzing the contribution of changes in female fertility by educational level to positive or non-declining changes in total fertility rates (TFR). First, we estimate fertility rates by educational level and examine how they have varied over time, especially during periods of stagnation. Then, we use a decomposition method to analyze changes in fertility rates. From there, we discern the extent to which fertility stalls are related to reversals and halts in the fertility decline of more educated women, or whether there is fertility plateauing at all educational levels, or whether it is due to an effect of changes in the composition of the population.

2 Data and methods

Since the 1980s, Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) collect information on, among other things, birth histories, fertility preferences and socioeconomic characteristics of women aged 15-49 in SSA. We use all available DHS and MICS in countries where evidence suggests a strong case of fertility stall (Schoumaker, 2019) and in which the educational level of the woman can be identified. Thus, our study includes 36 DHS and 4 MICS from 7 SSA countries: Cameroon, Congo, Kenya, Namibia, Rwanda, Zambia and Zimbabwe.

First, we reconstruct fertility trends by educational level since the 1980s using the Stata module for computing fertility rates and TFRs from birth histories, tfr2 (Schoumaker, 2013). Then, we smooth fertility trends using restricted cubic splines with 10-year knots. We group women in three educational levels: no education, primary education, and secondary and higher education.

Second, we use a decomposition method that allows to identify how much of the fertility change is attributable to fertility changes by educational level and schooling rates. This is done to identify the drivers of changes. For doing so, total fertility changes between time 1 and time 2 is decomposed into 4 components. The first three components refer to changes in fertility with respect to educational level \(TFR_i\) and the last to changes in the composition of the population \(P_i\). For instance, the change in the fertility of women with at least secondary education is the product of the change in the fertility of these women and the proportion of the total population of women aged 15-49 with at least secondary education. Then, the same for changes in women with primary education and no education. The fourth component is the change in the composition of the population in terms of schooling levels:
TFR_t^2 - TFR_t^1 = (TFR_t^2 - TFR_t^1) \times \left[ \frac{P_t^1 + P_t^2}{2} \right] +
(TFR_p^2 - TFR_p^1) \times \left[ \frac{P_p^1 + P_p^2}{2} \right] +
(TFR_N^2 - TFR_N^1) \times \left[ \frac{P_N^1 + P_N^2}{2} \right] +
\sum_{i=1}^{K} (P_i^2 - P_i^1) \times \left[ \frac{TFR_i^1 + TFR_i^2}{2} \right]

3 Preliminary results

For the purposes of this extended abstract, we present here the results only for three countries. Figure 1 displays the fertility trends by education level in Namibia. We observe the halt in fertility decline at the national level from the mid-2000s (see Namibia - country). Fertility in Namibia is currently stalled at 3.6 children per woman. Current fertility levels are lower than those in the 1980s; however, we observe that TFRs of women of all educational levels have been plateaued at some point over the last decades. Fertility rates among women with no education show a very slow decline since the early 1990s, decreasing by less than one child per woman in the last three decades. When compared to women with primary and at least secondary education, women with no education have the highest TFR. On the other hand, women with primary education have higher fertility than women with secondary and higher education by almost 2 children. TFR among women with primary education has been stalled since the mid-2000s at just below 5 children per woman. Regarding women with at least secondary education, fertility trends show a stagnation since the early 2000s at 3 births per woman. In all cases, results suggest that fertility decline has halted between one child and three children above replacement level. Bottom right panel of Figure 1 displays the contribution to fertility change by educational level. Colored areas above the x-axis, i.e. at positive y-axis values, are those that contribute to a positive change in fertility, i.e. to a stagnation or reversal in the decline of the TFR. We note that, although fertility is higher among women with no education and primary education, stalled fertility among women with at least secondary education contributes the most to the plateauing of fertility in Namibia. Women with primary education have contributed to a lesser extent to positive changes in fertility in most recent years. Overall, education has continued increasing, and the fertility stall is thus not accounted for by slower progress in education.

Fertility in Zimbabwe declined steadily in the 1980s and 1990s but then it halted at 4 children per woman in the early 2000s (see Figure 2). Since then, TFR has been stalling. By educational level, fertility among women with no education fell rapidly from 8 children per woman in the early 1980s to just below 5 in 2000. Then, TFR has slightly increased. Fertility decline among women with primary education has stalled at 5 children per woman since about 2000, following a decrease of two births per woman in the 1980s and 1990s. Fertility rates declined swiftly among women with secondary and higher education from below 6 children per woman in the early 1980s to 3.8 in the late 1990s. However, TFR has slightly increased since then to above 4 in recent years. On average, women with no education have currently two children more than women with at least secondary education and 0.5 children more than women with primary education. In all cases, fertility rates are well above replacement level. Bottom right panel of Figure 2 presents the contribution
to fertility change by educational level in Zimbabwe. We observe that at the beginning of the stall period, non-decreasing fertility of both, women with primary education and at least secondary education contributed to the halt in fertility decline at the national level. Nevertheless, the contribution of women with secondary and higher education has increased to the detriment of women with primary education, to the extent that, as of the 2010s, only the fertility of women with at least secondary education has contributed to stagnation. Here again, the stall is not accounted for composition effects. The increasing level of education has indeed contributed to decreasing fertility, which was offset by the increasing fertility among the better educated women.

We note that fertility has declined in Cameroon from almost 7 births per woman in the mid-1980s to 4.8 in the current years, except for a slowdown in the rate of decrease in the early 2000s to a level of 5 births (see Cameroon - country in Figure 3). At all educational levels, fertility rates are well above replacement level. Results suggest that the composition effect does not account for the period of stalled fertility. Fertility rates among women with no education increased steadily until the early 2000s, but then have decreased rapidly to the levels observed in the early 1970s. In contrast, there is a clear stagnation in fertility decline since about 2000 among women with primary and at least secondary education. As for women with primary education, fertility declined by approximately one child per woman from the early 1980s until 2000, when the fertility decline was stagnant at a level of 6 births per woman. Fertility declined from 5 children per woman in the mid-1980s to below 4 in the early 2000s among women with at least secondary education; however, we observe a halt in fertility decrease since then. Bottom right panel of Figure 3 displays the contribution to fertility change by educational level in Cameroon. Although the fertility of women with no education was contributing to the increase in the TFR, it is observed that fertility levels in the 1980s decreased mainly due to the fall in the fertility of women with primary and at least secondary education. However, these same women are the ones who contributed to the slowdown in fertility decline from the early 1990s to the mid-2000s. Thereafter, the fertility of women with at least secondary education has been boosting up the TFR, but the decrease in fertility of women with no education has offset it. Enrollment in education has increased in Cameroon in recent decades, which would explain the decline in fertility levels, however, the plateauing of fertility among the most educated women persists.

4 Preliminary conclusions

Demographic theory predicts the decline in fertility rates among most educated women as fertility transition progresses. Our preliminary results suggest that halts and reversals in fertility decline among women with secondary and higher education account for stagnant fertility in countries with strong evidence of fertility stalls. Moreover, although we also find fertility plateaus among women with lower levels of education, these higher and non-declining fertility rates would not explain much of the stagnation in fertility at the national level.
Figure 1: Reconstructed fertility rates by educational level in Namibia.
Figure 2: Reconstructed fertility rates by educational level in Zimbabwe.
Figure 3: Reconstructed fertility rates by educational level in Cameroon.
References


