Education and Fertility in Sub-Saharan Africa: What Do We Really Know?*

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Abstract

This paper studies educational differences in fertility in sub-Saharan Africa. We examine data from 29 countries, at different levels of fertility and from the different subregions in sub-Saharan Africa. We show that the conventional classification of women in the region into a small number of schooling groups conceals a clear and consistent pattern of more rapid fertility declines with increased educational attainment (i.e., widening fertility differentials) as one moves through the secondary group from those with less schooling to those with more schooling. The strength of this relationship varies with place of residence: we compare national capitals, other urban places, and rural areas. We document differences in attitudes and behaviors among these education subgroups that help account for the observed differences in fertility, and we analyze fertility differences by education in a multivariate context. Finally, we discuss implications of our findings for the future of fertility transition in the region.

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Introduction

In 1979, Susan Hill Cochrane's monograph, *Fertility and Education: What Do We Really Know?*, was published. It reviewed data from many countries in the process of exploring the numerous pathways via which educational attainment influences fertility. However, at that time reliable data from sub-Saharan Africa was very scarce, and consequently Cochrane was not able to provide much evidence regarding the relationships between education and fertility in the region. Several years later, the Demographic and Health Surveys (DHSs) began, and this ongoing program has provided a wealth of high-quality data. In this paper, we use DHS data from 29 countries in the region to explore the various factors that link education and fertility.

In particular, the paper is a detailed study of educational differences in fertility within sub-Saharan Africa. The detail begins with the classification of women into educational attainment groups. Aided and abetted by the STATcompiler provided by the Demographic and Health Survey (DHS) Program, many researchers who take women's education into account use a three-way classification scheme: none, primary, and secondary and higher.[1, 2] Here we use seven categories: none, 1-5 years of primary school, 6 years of primary school, 7 or 8 years of school, 9 or 10 years of school, 11-12 years of school, and 13 or more years of school. For an educational system with 6 years of primary school and six years of secondary school, these categories correspond to none, incomplete primary, complete primary, low secondary, mid-secondary, high secondary, and post-secondary.[3]

[1] The DHS Program has recently introduced a new version of the STATcompiler that separates secondary and post-secondary into two groups.
[2] A significant and notable exception to this statement is provided by the projections produced by the Wittgenstein Center (http://www.oeaw.ac.at/vid/dataexplorer/), in which six different education categories are used (Lutz, Butz, and KC, 2014).
[3] There is variation across countries in educational systems, with primary school often but not always entailing six years of schooling. We have chosen to measure number of years rather than educational level to facilitate comparisons.

The second level of detail entails introduction of emphasis on differences by place of residence. That is, in our analyses below, we generate national-level estimates for each country, but we also produce separate estimates by place of residence, distinguishing residents of capital cities or regions from those in smaller urban places and those in rural areas.

We begin with an examination of fertility levels by educational attainment in 29 countries, all of which have at least two surveys that allow us to identify the capital, other urban, and rural places.[4] These countries come from different subregions of the continent and within subregions, there are distinctly different levels of fertility in three of the four subregions.[5] We use data from the most recent survey available for each country. These data show that for the most part, beginning with women having 6 years of schooling, additional years of schooling are associated with more rapidly declining fertility as years of schooling increases up through the secondary level. Disaggregation by size of place of residence reveals that the strength of the predominantly inverse association between years of schooling and fertility varies among the biggest cities, smaller urban places, and in rural areas.

Following presentation of the data linking education and fertility, we examine attitudes and behaviors that vary across education groups and contribute to the observed differences in fertility. Cochrane's (1979) classic analysis of the relationship between education and fertility highlighted numerous pathways via which education might influence fertility. Here we use DHS data and follow in Cochrane's footsteps, looking at both socioeconomic factors and proximate determinants of fertility in an effort to identify the different factors contributing to the inverse association between education and fertility. In particular, we examine ideal fertility, being in

[4] For Nigeria, DHS data do not allow identification of the capital nor of the largest city, Lagos, and hence Nigeria was not included in the study.
[5] There are only two countries from Southern Africa, and both have the low fertility characteristic of the subregion (Shapiro, 2012).

union, frequency of intercourse among those in union, age at first birth, use of modern contraception, and infant and child mortality, and how each of these factors varies with women's educational attainment and by place of residence.

The final substantive section of the paper consists of multivariate analyses of fertility (children ever born) at the individual level, with a focus on estimation of fertility differentials by education, controlling for age and for religion (Muslim). These multivariate analyses reinforce the earlier findings from aggregated data (TFRs).

The paper concludes with a summary and discussion of the implications of the findings for the future of fertility transition in the region. In brief, given the secular increase in women's education in conjunction with the apparent greater impact of education on fertility as education increases beyond the primary level, there appear to be good prospects for sustained and more rapid declines in fertility in the future, despite the phenomenon of stalling in fertility decline that has been observed in the region.

Fertility, Educational Attainment, and Place of Residence in Sub-Saharan Africa

Data on fertility and educational attainment in sub-Saharan Africa are shown for the most recent DHS in 29 countries in the region in Table 1. The countries have national-level TFRs ranging from 3.3 to 7.6. Twelve of these countries are from Western Africa (with TFRs ranging from 4.0 to 7.6) and another 10 are from Eastern Africa (with TFRs from 4.1 to 6.4), while five are from Middle Africa (with a range of TFRs from 4.1 to 6.6) and two are from Southern Africa (with both TFRs below 4). Hence, for three of the four subregions there is a good bit of variation in fertility.

While Table 1 is dense with a substantial amount of information embedded in it, and there is clearly considerable variation across the different countries, consideration of the data shows four noteworthy aspects:

First, there is a clear tendency for fertility rates to decline as educational attainment increases, and this tendency gets stronger with increased educational attainment up through 12 years of school. For example, if one examines the TFRs for all women, in 22 of the 29 countries the TFR is lower for those with 1-5 years of schooling than for those with no schooling. In 24 of the countries the TFR for those with six years of schooling was lower than that for those with 1-5 years, and in 26 countries this is true in moving from six years to 7-8 years. For the next two transitions, there is only one case in which the TFR did not decline as educational attainment increased. And finally, in moving from 11-12 years of school to 13 or more, the TFR fell in 22 of the 29 cases.

Hence, while there are cases in which the TFR increases as schooling increases, they are infrequent, and rare at the mid- and upper-secondary school levels. This may be seen by considering the mean values of the TFRs by educational attainment, which decline monotonically as educational attainment increases. For all women, the average TFR is 6.3 for those with no schooling, 5.2 for those with six years of schooling, 3.0 for those with 11-12 years of schooling, and 2.6 for those with postsecondary education. These mean values decline monotonically as well when the population is divided up according to place of residence (except for one case, in going from 1-5 to six years in the capitals, where there is a very slight increase), although the levels vary somewhat by place of residence.

A second and related aspect here is that when all women are considered, the declines in fertility associated with increasing schooling tend to widen as one moves through the secondary

level. For example, the maximum declines in average TFRs by schooling category among all women are in moving from 9-10 to 11-12 years and then from 7-8 to 9-10 years. Once the population is disaggregated by place of residence, increased schooling at the secondary level remains associated with clear declines in average fertility. For example, in capital cities, the largest difference in fertility between education groups is between those with no schooling and those with 1-5 years, but the second-largest decline is in going from 9-10 to 11-12 years of school. In other urban places, the transition from zero to 1-5 years of schooling is again largest, but followed closely by those from 7-8 to 9-10 years of school, 6 to 7-8 years, and from 9-10 to 11-12 years of schooling, all of which are close to 0.5 children. In rural areas, the largest decline is in going from 11-12 to 13+ years of school, but the three transitions to what is typically to and through secondary school are all substantial.[6]

A third aspect of note is that fertility varies systematically by place of residence. For the 29 countries, the average TFR nationally was 5.2 children. However, in the capital cities, the mean value was 3.5 children, while in other urban places it was 4.2 and in rural areas it was 6.0. This pattern of fertility rates, with those in the capital city being lowest and those in rural areas being the highest, held for 24 countries. In five countries (Chad, Kenya, Lesotho, Malawi, and Mali), the TFR in the capital was the same or slightly higher than that in other urban places.

Holding educational attainment constant, fertility is most often lowest in the capitals and highest in rural places. Averages for the countries show this pattern in all but one case, but examination of the detailed disaggregated data shows that there are numerous exceptions to this statement. The differences by place of residence are widest among those with 0-6 years of

[6] There is a selection bias issue in comparing the 11-12 and 13+ schooling groups in rural areas: in some countries there are inadequate numbers of rural women with 13+ years of schooling. If one compares only countries with sufficient observations at both levels, the magnitude of the decline diminishes to just under one child, still the largest difference.

schooling. Since educational attainment tends to be highest in the capitals and lowest in rural areas (cf., Shapiro and Tenikue, 2015), the lower fertility in capitals presumably reflects in part the community effects of schooling discussed by Cochrane (1979), first identified quantitatively by Kravdal (2002), and also found by Shapiro (2012).

And finally, the sensitivity of the TFR to increases in schooling varies by place of residence. In the capital cities, women with no schooling have, on average, 4.9 children, while women with more than 12 years of schooling have 2.5 children. In rural areas, by contrast, women with no schooling have 6.6 children on average, while those with more than 12 years of school have 2.5 children, on average – the same as their big-city counterparts. Hence, rural fertility is more sensitive to individual education than is fertility in the capital cities.

The findings just discussed may be seen clearly in Figure 1, which shows average TFRs for each educational attainment group for all women and separately by place of residence. Differences by place of residence are widest at the lowest schooling levels and narrow as schooling increases. All four curves decline monotonically as educational attainment increases; the curves tend to get steeper after six years of schooling, especially in rural areas and in the capitals; up through 12 years of school, fertility is always highest in rural places and lowest in the capitals (the small numbers of college-educated rural women have exceptionally low fertility); and the decline in TFRs in going from those with no schooling to those with postsecondary education is greatest in rural areas and smallest in the capitals.[7]

Preferences and Behaviors Contributing to the Fertility Differences by Education

[7] The magnitude of this difference reflects the sharp drop in rural fertility among women with some college education. However, the pattern of higher declines among rural residents and lower declines among those living in the capital remains even if one stops after 11-12 years of schooling.

In this section we examine different factors that potentially contribute to the observed fertility differences by education. Ideal number of children, age of entry into union, frequency of intercourse, age at first birth, use of modern contraception, and infant and child mortality and how each of these factors varies with women's educational attainment and place of residence are the focus here.

Figure 2 shows ideal number of children in relationship to both educational attainment and place of residence. This is a good indicator of demand for children, and indeed is highly correlated with actual fertility (Westoff et al., 2013; Shapiro, 2016). As with actual fertility, the figure shows the greatest differences by place of residence at lower levels of schooling, monotonic declines in ideal fertility with education, and highest ideal fertility in rural places and lowest in capitals.

The average percentage of women in union, by educational attainment and place of residence, is shown in Fig. 3. Cochrane (1979) and many others have noted that one means by which increasing educational attainment contributes to lower fertility is to delay entry to marriage. While we do not control for age in the graph, it does show that there is a substantial decline in the percentage of women in union as educational attainment increases. While some of the decline undoubtedly reflects the fact that, given the long-term increase in women's educational attainment (Barro and Lee, 2013), better-educated women on average are younger than those with little education, some preliminary analyses we have done suggest that even after controlling for age, there remains a distinct negative effect of schooling on the likelihood of being in union. This is clearly an avenue to be pursued in future work. Further, it is clear from the graph that holding years of schooling constant, the likelihood of a woman being in union tends to be highest in rural places and lowest in the capitals.

In Fig. 4, we show the mean duration since last sex among women in union by years of schooling and place of residence. Over all, this rises from 13 days for women with no schooling to a little more than 16 days for those with 11-12 years, before falling for the highest education group. These durations are typically, but not always, highest for women in the capital cities and lowest for women in rural places, with the differences by place of residence being especially pronounced for women with lower levels of schooling.

Mean age at first birth by years of schooling and place of residence is shown in Fig. 5. There is not much variation by years of schooling for the first several groups, but mean age increases modestly beginning with the group with 9-10 years of schooling and then more rapidly in moving to the last two groups. Most often, holding schooling constant, mean age is highest in the capitals and lowest in rural places.

Fig. 6 shows average current use of modern contraception among women in union by years of schooling and place of residence. There is a clear tendency for contraceptive use to increase with schooling, and as before differences tend to be widest at the lowest schooling levels and most frequently use is highest in the capitals while lowest in rural places. Over all, however, with maximum average contraceptive use reaching only a bit more than 35 percent for the small group of best-educated women, it seems like this factor is at best a modest contributing factor to the observed fertility differences by educational attainment.

Regional differences in average modern contraceptive use by years of schooling are shown in Fig. 7 for the different subregions of sub-Saharan Africa (Eastern and Southern are combined since there are only two countries from Southern Africa). There is a clear but for the most part modest tendency for contraceptive use to increase with years of schooling. At the

same time, it is clear that given schooling, the use of contraception is quite low in both Western and Middle Africa compared to Eastern and Southern Africa.

A final graph shows average mortality rates for children under age 5, by schooling and place of residence. Because of limited numbers of observations, we use only four education groups (0, 1-6. 7-11, 12+) rather than seven. Average mortality declines as years of schooling increases, and tends to be highest in rural places and lowest in the capitals.

Education and Fertility in a Multivariate Context

To this point we have examined differences in fertility and other factors with differentiation by detailed education group as well as by place of residence, using aggregated data. We have not taken age or differences in age composition between these groups into account, however. As noted above, the secular increase in women's educational attainment (Barro and Lee, 2013) means that younger women are likely to be better-educated than their older counterparts. Failure to take age into consideration raises the possibility that the correlation between age and schooling may cloud the link between education and fertility.

In this section we use individual data to examine cumulative fertility to date, or children ever born, in a multivariate context. Explanatory variables include our detailed schooling groups, and estimates are done overall (controlling for place of residence) as well as separately by place of residence. In addition, we control for age and age squared of the woman, and for whether she is Muslim (some preliminary work suggested that other things equal, Muslim women sometimes have higher fertility). We estimated multivariate linear regression models using the combined (pooled) data for individuals from the 29 sub-Saharan African countries to

examine the determinants of fertility, proxied by children ever born. To account for complex survey design, the survey procedure in Stata is used.

Results in Table 2 indicate a monotonic decline in children ever born as education increases, over all and separately by place of residence. It is apparent that increased schooling has more impact in rural areas than in capital/large cities in reducing fertility, especially for the three highest schooling groups. In addition, country-specific regressions showed that in 25 of the 29 countries, significant fertility differentials are evident only beginning with low secondary schooling (7-8 years of schooling).

Place of residence is significantly associated with fertility. Relative to those living in rural areas, capital/large city and other urban residents have significantly lower fertility. In the separate equations by place of residence, the lower fertility in capitals and other urban places may be seen via the smaller coefficients of age, as compared to rural places.

Relative to followers of Christianity and other religions, Muslim respondents exhibited higher fertility in the data for all women. But there are clearly differences by place of residence: being a Muslim was not a significant predictor of higher fertility in large cities and other urban areas, however it was a significant predictor of higher fertility rural areas. Additionally, country-specific regressions indicated that Muslim religion was a significant predictor of fertility in 13 of the countries.

Summary and Conclusions

The results of our analyses make it clear that in sub-Saharan Africa, there are strong linkages between education and fertility. While there are lots of differences across countries, it is evident that on average, especially as one moves to what typically corresponds to secondary schooling,

there tend to be systematic declines in fertility. There are also regular patterns of differences by place of residence, with fertility tending to be lowest in capitals and other large cities, somewhat higher in other urban places, and highest in rural areas.

Examination of analyses that look at schooling and place of residence jointly shows that these differences by education and place of residence are also reflected in women's ideal number of children, an indicator of demand for numbers of children. With the exception of women with the highest level of schooling, the percentage of women in union is inversely related to years of schooling, and highest in rural areas while lowest in the capitals. Likewise, examination of frequency of intercourse, age at first birth, use of modern contraception, and mortality of children under the age of five shows for the most part similar patterns, with these variables showing systematic differences by educational attainment (especially beyond six years of schooling) that tend to contribute to the observed fertility differences by schooling.

The results that examine education and place of residence jointly also show consistent differences by place of residence, holding schooling constant. Distinguishing capital/large cities from other urban places shows that the former tend to have lower fertility and fertility-relevant behaviors than the smaller urban places, while with the exception of highly-educated rural women, a rather selected group, fertility is highest in rural areas and relevant behaviors and indicators vary accordingly. Our multivariate analyses document that controlling for age and religion, fertility (children ever born) declines monotonically with educational attainment, overall and by place of residence.

Given that schooling of women has increased over time, and that this trend will likely continue, the implication is that as more countries experience increased women's schooling, particularly at the secondary level, there will be downward pressure on fertility in the region.

Similarly, the results here suggest that increased urbanization and continued growth of large cities will also contribute to lower fertility. Hence, despite the stalling of fertility declines that have been observed in the region, the growth of women's educational attainment may eventually contribute to an acceleration of the pace of fertility transition in sub-Saharan Africa.

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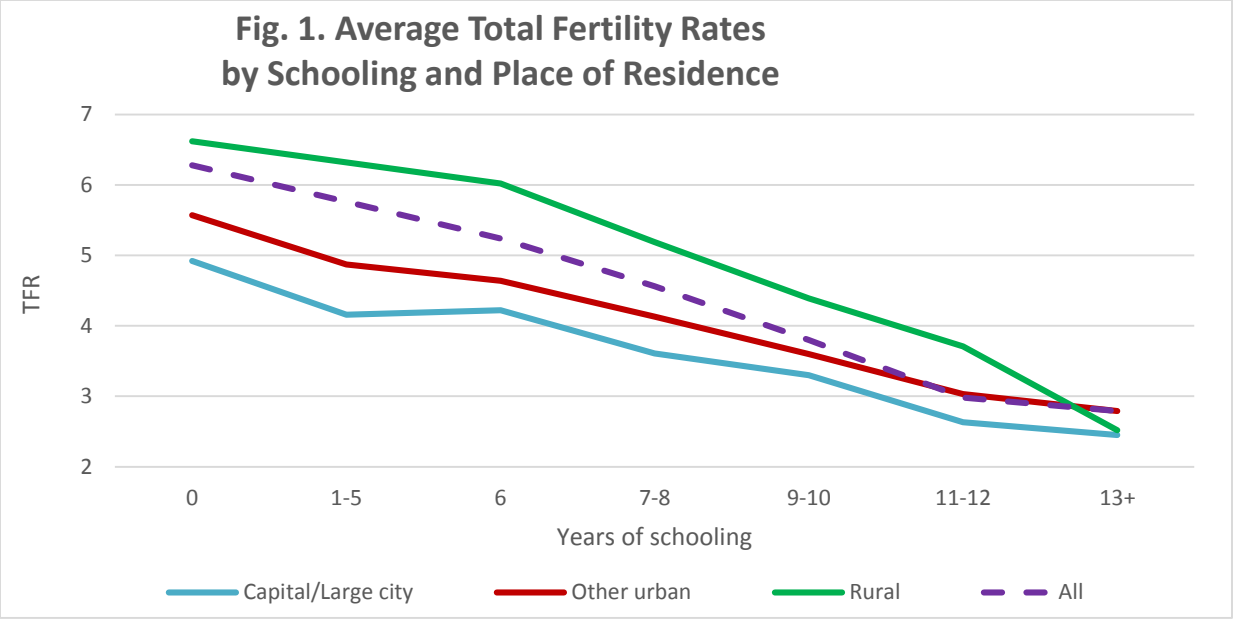
Fig. 1. Average Total Fertility Rates
by Schooling and Place of Residence
TFR
7
6
5
4
3
2
0
1-5
6
7-8
9-10
11-12
13+
Years of schooling
Capital/Large city
Other urban
Rural
All

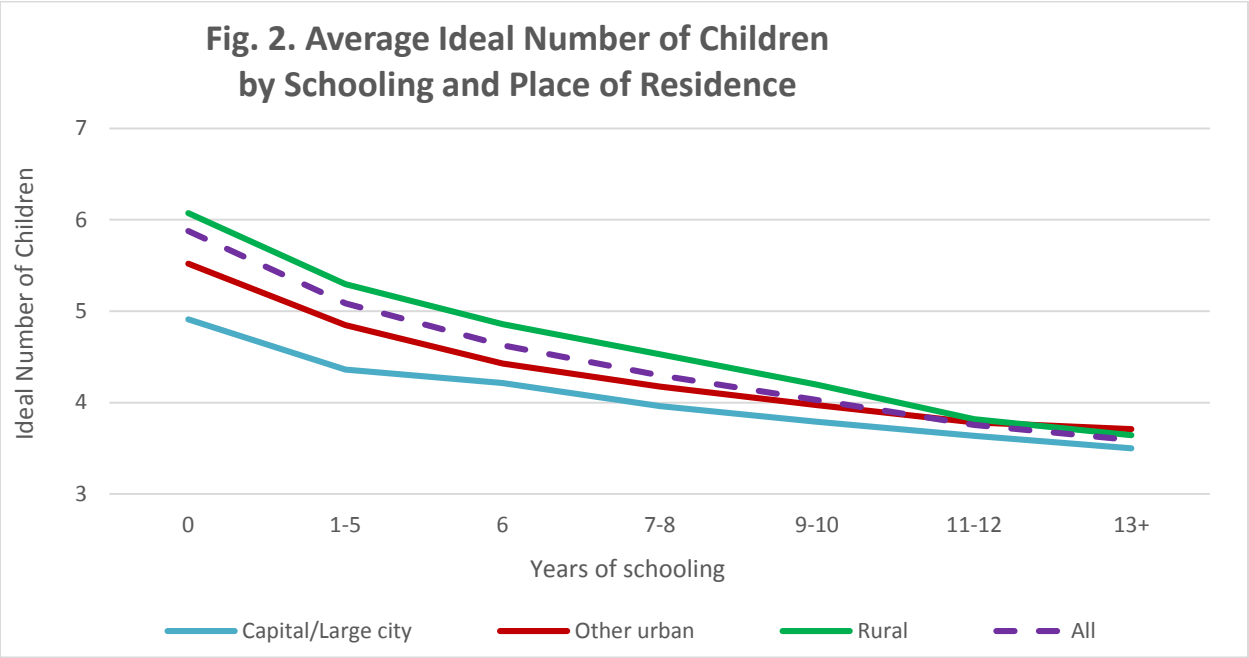
Fig. 2. Average Ideal Number of Children
by Schooling and Place of Residence
Ideal Number of Children
7
6
5
4
3
0
1-5
6
7-8
9-10
11-12
13+
Years of schooling
Capital/Large city
Other urban
Rural
All

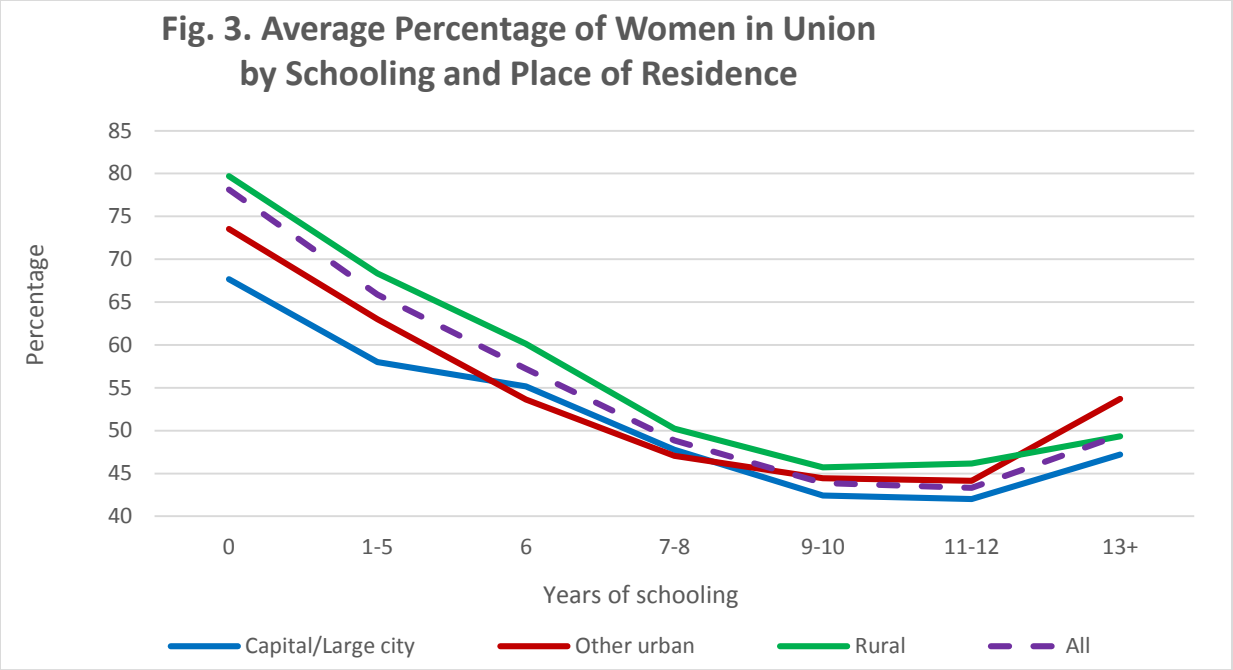
Fig. 3. Average Percentage of Women in Union by Schooling and Place of Residence
Percentage
85
80
75
70
65
60
55
50
45
40
0
1-5
6
7-8
9-10
11-12
13+
Years of schooling
Capital/Large city
Other urban
Rural
All

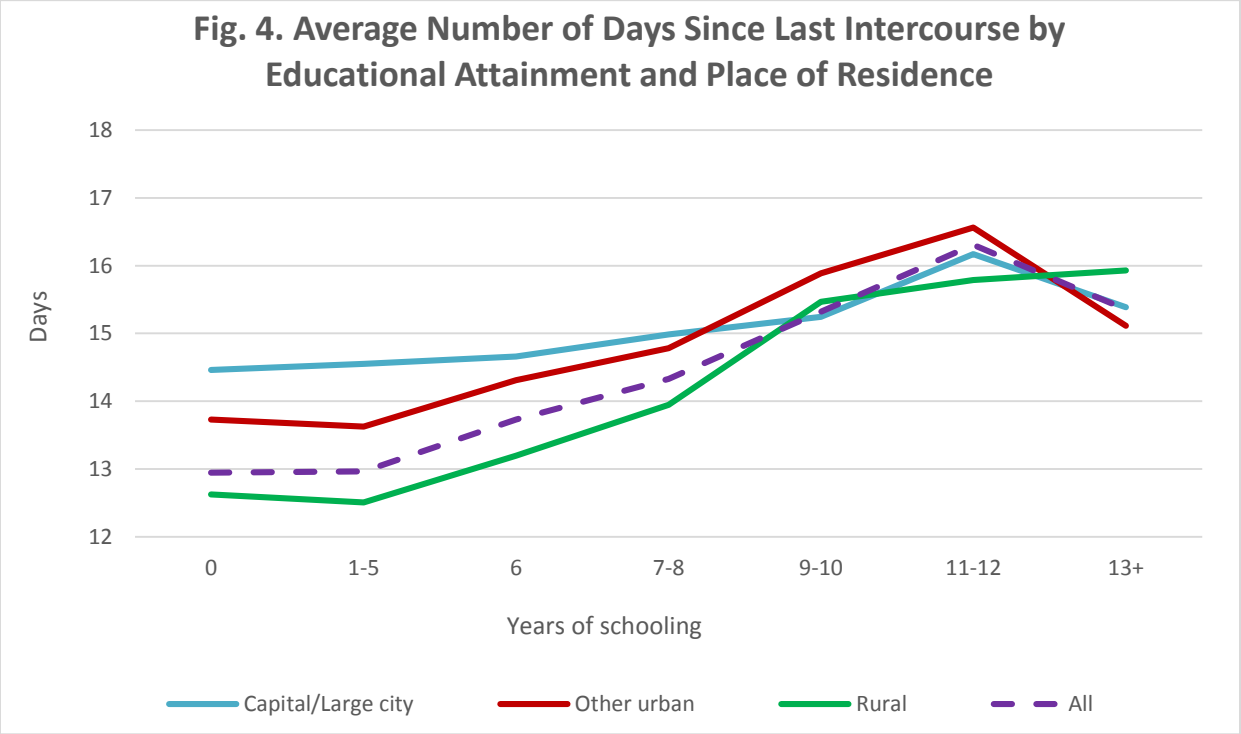
Fig. 4. Average Number of Days Since Last Intercourse by Educational Attainment and Place of Residence
Days
18
17
16
15
14
13
12
0
1-5
6
7-8
9-10
11-12
13+
Years of schooling
Capital/Large city
Other urban
Rural
All

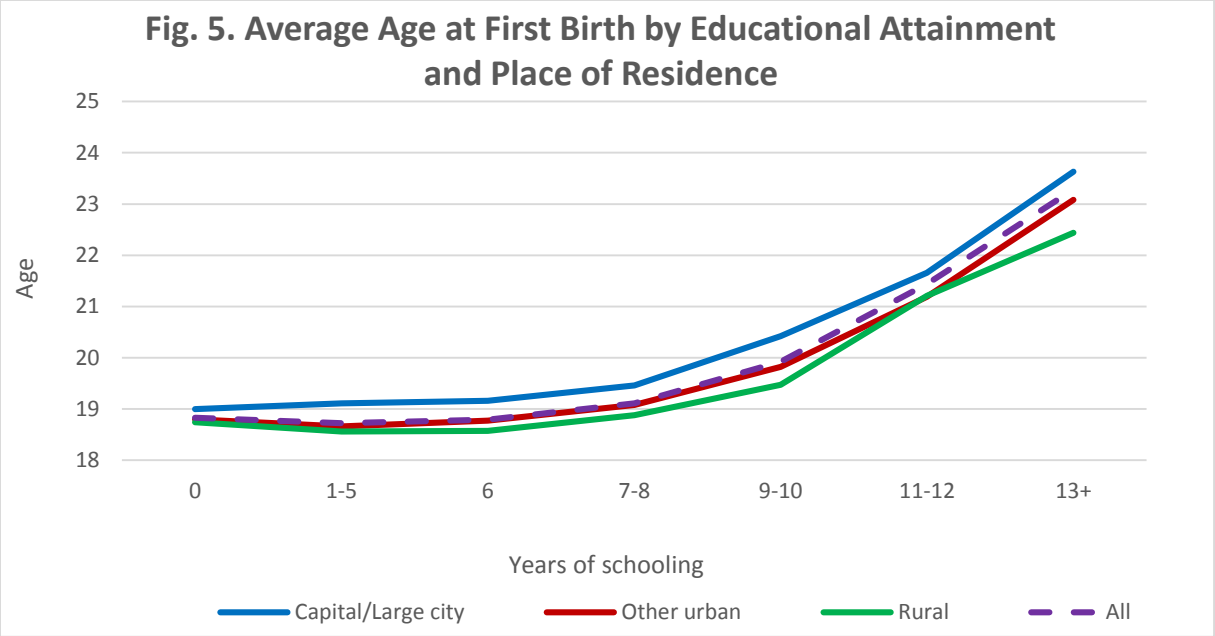
Fig. 5. Average Age at First Birth by Educational Attainment and Place of Residence
25
24
23
22
21
20
19
18
Age
0
1-5
6
7-8
9-10
11-12
13+
Years of schooling
Capital/Large city
Other urban
Rural
All

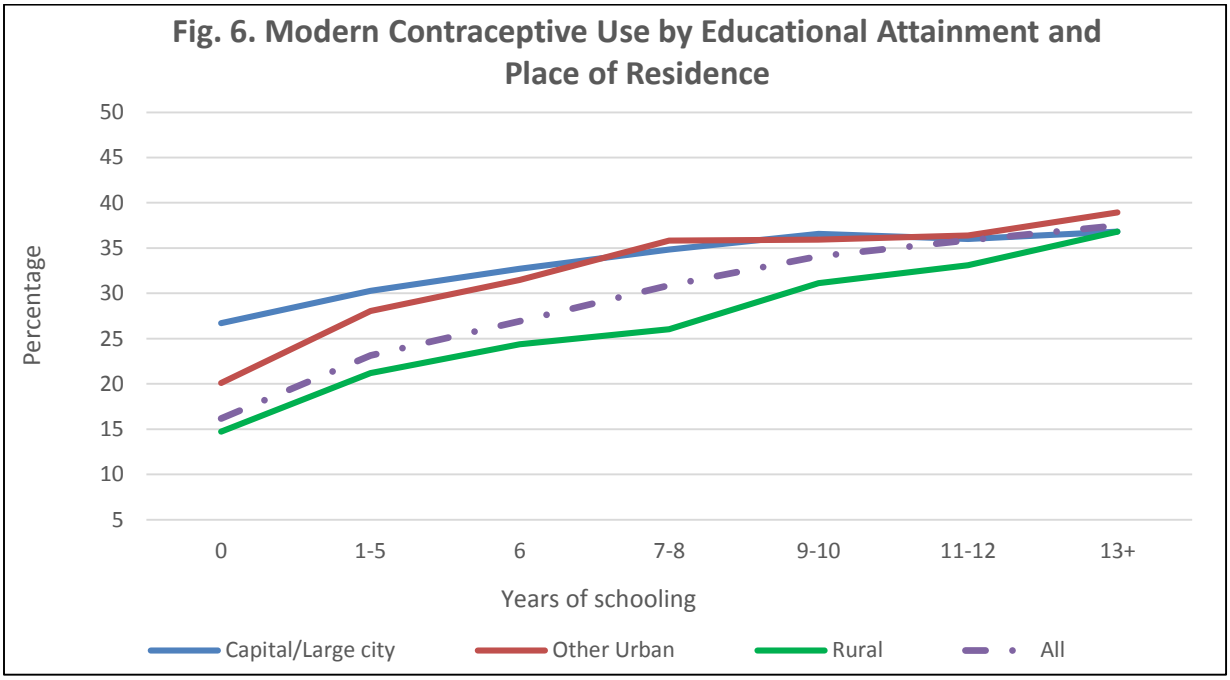
Fig. 6. Modern Contraceptive Use by Educational Attainment and Place of Residence
50
45
40
35
30
25
20
15
10
5
Percentage
0
1-5
6
7-8
9-10
11-12
13+
Years of schooling
Capital/Large city
Other Urban
Rural
All

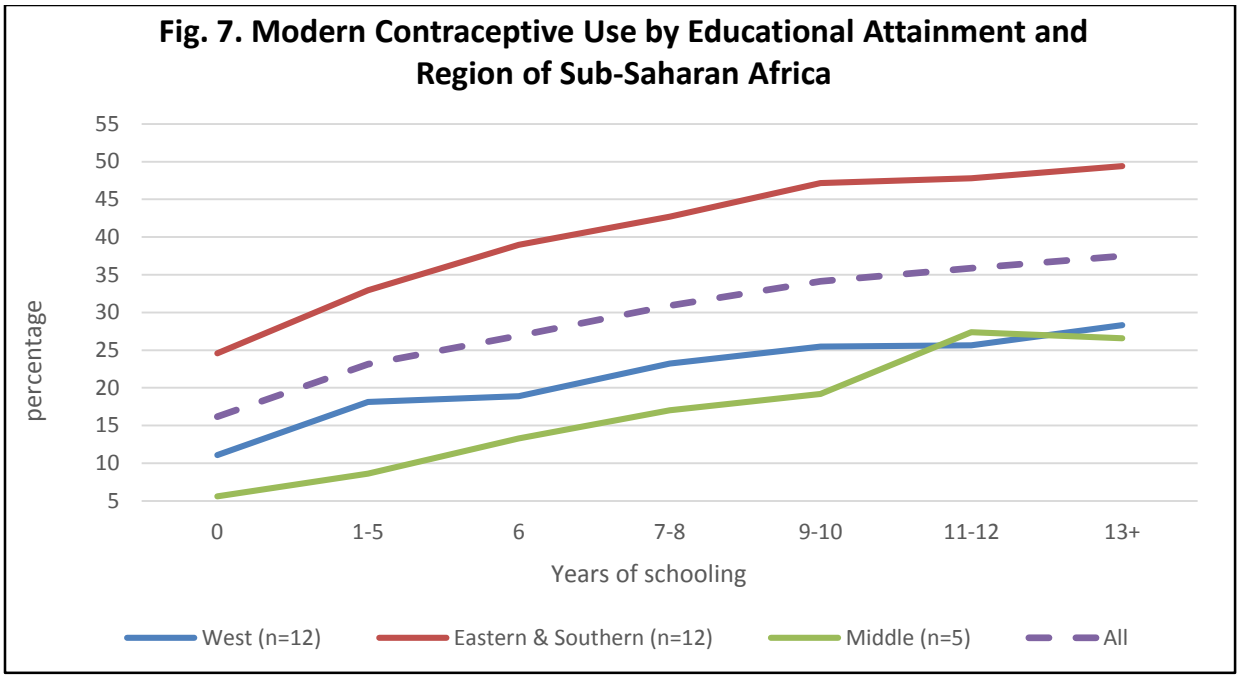
Fig. 7. Modern Contraceptive Use by Educational Attainment and Region of Sub-Saharan Africa
percentage
55
50
45
40
35
30
25
20
15
10
5
0
1-5
6
7-8
9-10
11-12
13+
Years of schooling
West (n=12)
Eastern & Southern (n=12)
Middle (n=5)
All

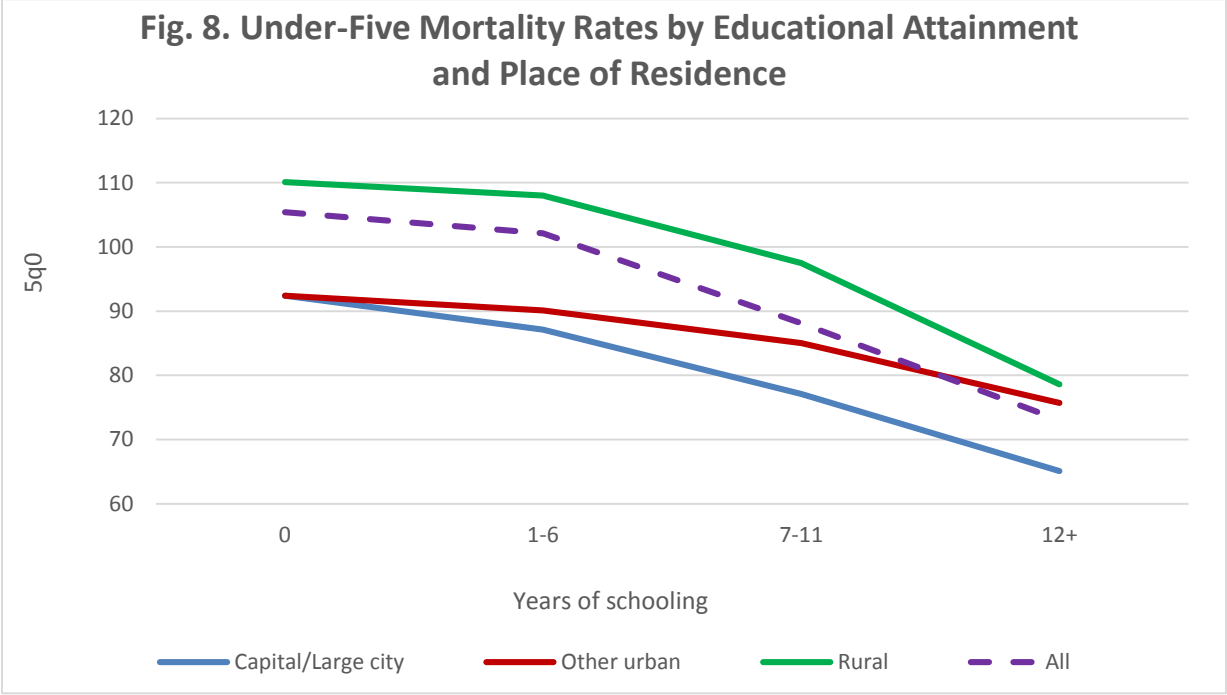
Fig. 8. Under-Five Mortality Rates by Educational Attainment and Place of Residence
5q0
120
110
100
90
80
70
60
0
1-6
7-11
12+
Years of schooling
Capital/Large city
Other urban
Rural
All

Table 1. Total Fertility Rates by Educational Attainment and by Place of Residence									
Country	Place of Residence	Years of Schooling							
		0	1-5	6	7-8	9-10	11-12	13+	All
Benin	All	5.6	4.6	4.3	4.3	4.1	3.5	3.3	4.9
	Cotonou	4.5	3.4	3.3	3.6	3.7	3.0	2.9	3.6
	Other urban	5.3	5.2	3.8	4.5	4.2	3.9	3.9	4.7
	Rural	5.8	4.9	5.5	5.1	4.7	3.6	NA	5.4
Burkina Faso	All	6.6	5.0	4.5	4.0	2.9	2.5	3.0	6.0
	Ouagadougou	4.4	3.0	3.4	2.9	2.7	2.1	3.2	3.4
	Other urban	5.3	4.4	3.8	4.4	2.7	2.7	2.2	4.4
	Rural	6.9	6.2	5.4	5.6	3.7	3.9	NA	6.7
Burundi	All	6.8	6.8	6.2	5.8	4.4	3.5	4.1	6.4
	Bujumbura	4.5	5.4	4.6	4.6	3.3	3.4	3.7	4.2
	Other urban	7.3	6.4	6.4	6.8	3.5	3.6	4.2	5.9
	Rural	6.8	6.9	6.4	6.4	5.8	3.5	NA	6.6
Cameroon	All	6.8	6.3	5.3	4.7	4.1	2.9	3.1	5.1
	Douala/Yaoundé	7.0	4.1	3.8	3.8	3.5	2.8	2.9	3.3
	Other urban	5.6	6.1	4.7	4.6	4.1	2.7	3.3	4.5
	Rural	7.0	6.8	6.4	5.6	5.2	3.7	4.0	6.4
Chad	All	6.3	7.7	5.6	5.6	4.3	3.3	2.5	6.3
	N'djamena	7.0	6.2	6.2	5.4	4.3	3.3	2.5	5.8
	Other urban	6.1	5.6	5.8	NA	3.4	4.9	2.2	5.7
	Rural	6.3	8.4	5.1	2.5	NA	NA	NA	6.5
Congo	All	6.8	6.6	6.5	5.3	4.6	3.6	3.3	5.1
	Brazzaville/Pt. Noire	6.1	5.5	6.2	4.7	4.3	3.5	3.3	4.4
	Other urban	5.5	6.6	6.0	4.8	5.0	3.3	3.8	5.0
	Rural	7.2	7.0	7.0	6.2	5.6	4.2	3.2	6.5
Cote d'Ivoire	All	5.8	5.3	4.4	3.9	2.8	2.3	2.1	5.0
	Abidjan	3.7	3.6	3.8	3.2	2.5	1.7	2.0	3.1
	Other urban	5.1	4.5	4.0	3.9	2.9	2.5	2.2	4.3
	Rural	6.6	6.2	5.1	5.5	3.2	2.9	3.3	6.3
DRC	All	7.4	7.5	7.2	6.6	6.1	4.7	2.9	6.6
	Kinshasa	NA	6.8	5.3	5.4	4.8	3.6	2.5	4.2
	Other urban	6.0	7.1	6.8	6.7	6.4	4.8	3.2	6.0
	Rural	7.5	7.6	7.6	6.8	6.7	6.1	NA	7.3
Ethiopia	All	5.8	5.0	5.6	2.6	2.1	1.4	1.3	4.8
	Addis Ababa	2.2	1.6	2.5	1.7	1.4	1.1	0.8	1.5

	Other urban	3.9	3.2	3.4	2.6	2.6	1.4	1.4	3.0
	Rural	6.0	5.7	8.4	3.0	1.6	NA	1.3	5.5
Gabon	All	5.5	5.9	5.5	4.2	3.7	3.0	2.8	4.1
	Libreville	4.8	4.5	4.4	4.1	3.6	2.8	2.7	3.5
	Other urban	7.1	6.4	5.7	4.1	3.7	3.3	2.9	4.5
	Rural	7.0	7.3	7.7	5.1	4.2	NA	NA	6.1
Ghana	All	6.2	4.8	4.9	4.5	3.9	2.6	2.6	4.2
	Accra	4.6	4.0	NA	3.4	2.8	NA	2.0	2.8
	Other urban	5.4	4.3	4.1	4.2	4.1	NA	2.8	3.8
	Rural	6.6	5.2	5.8	5.2	4.2	NA	3.6	5.1
Guinea	All	5.7	5.1	5.2	3.8	3.6	2.9	1.9	5.1
	Conakry	4.6	4.7	5.0	3.0	3.8	2.6	1.5	3.6
	Other urban	4.7	4.3	4.3	4.3	4.4	3.4	2.6	4.1
	Rural	6.0	5.7	7.6	4.5	3.8	3.2	2.2	5.8
Kenya	All	6.5	4.9	4.8	4.2	3.2	3.1	2.4	3.9
	Nairobi	5.7	3.3	5.3	3.7	2.8	2.5	2.0	3.2
	Other urban	5.3	3.8	4.1	3.4	2.6	2.9	2.3	3.1
	Rural	6.8	5.3	5.0	4.6	3.8	3.5	2.8	4.5
Lesotho	All	5.7	4.9	4.1	3.7	2.6	1.9	2.2	3.3
	Maseru	NA	NA	1.9	2.4	2.0	1.9	1.9	2.1
	Other urban	NA	3.0	2.5	1.9	2.2	1.7	2.3	2.1
	Rural	6.5	5.2	4.7	4.3	3.0	2.0	2.6	4.0
Liberia	All	5.8	5.2	4.8	4.0	3.7	2.4	3.1	4.7
	Monrovia	4.2	3.4	4.4	3.0	3.5	2.2	3.2	3.3
	Other urban	5.3	5.4	4.2	4.7	3.2	3.0	NA	4.8
	Rural	6.6	6.1	6.1	5.0	5.6	3.7	NA	6.1
Madagascar	All	6.4	5.3	3.7	3.4	3.0	2.5	1.9	4.8
	Antananarivo	4.5	3.4	2.6	2.6	2.4	2.3	1.8	2.8
	Other urban	6.0	3.4	3.4	2.5	2.6	2.3	2.5	3.0
	Rural	6.4	5.5	3.7	3.8	3.3	2.7	1.6	5.2
Malawi	All	6.9	6.3	5.9	5.0	4.3	3.0	2.1	5.7
	Lilongwe	5.5	5.4	5.7	4.2	3.8	2.6	2.4	4.5
	Other urban	5.8	4.9	6.1	3.6	3.8	2.5	2.1	3.8
	Rural	7.0	6.4	5.8	5.3	4.6	3.5	1.8	6.1
Mali	All	6.5	6.0	5.3	4.4	4.1	3.4	3.7	6.1
	Bamako	5.9	4.9	4.6	4.6	4.5	3.2	4.5	5.1
	Other urban	5.8	5.8	4.5	3.5	3.6	2.9	2.6	4.9
	Rural	6.6	6.6	6.6	5.3	3.7	4.6	NA	6.5

Mozambique	All	6.8	6.3	5.1	4.6	3.4	2.6	2.1	5.9
	Maputo	3.6	3.5	3.9	3.9	2.5	1.6	1.7	3.1
	Other urban	6.0	5.7	5.0	4.2	3.4	2.7	2.6	4.9
	Rural	7.0	6.7	5.3	5.7	4.0	3.6	NA	6.6
Namibia	All	5.2	5.3	4.6	4.2	3.8	2.8	2.2	3.6
	Windhoek	NA	3.8	NA	2.7	3.5	2.2	2.0	2.6
	Other urban	4.4	4.8	4.1	3.5	3.3	2.7	2.6	3.2
	Rural	6.0	5.7	5.4	4.9	4.4	3.7	2.2	4.7
Niger	All	8.0	7.2	6.3	5.9	5.0	3.1	3.0	7.6
	Niamey	6.8	4.6	5.5	4.4	5.3	2.3	3.2	5.3
	Other urban	6.6	5.8	4.5	6.3	4.2	2.6	3.6	5.8
	Rural	8.2	8.5	7.7	7.1	6.4	NA	NA	8.1
Rwanda	All	5.3	5.0	4.3	3.8	3.5	2.5	2.1	4.6
	Kigali	4.6	3.8	3.4	2.7	4.1	2.0	2.7	3.3
	Other urban	4.2	4.2	2.9	3.4	4.0	3.4	NA	3.7
	Rural	5.4	5.2	4.5	4.1	3.3	2.7	0.9	4.8
Senegal	All	6.2	4.4	5.1	4.3	3.5	2.5	2.2	5.0
	Dakar	5.0	3.5	2.1	3.7	1.8	2.0	2.0	3.5
	Other urban	5.6	4.1	6.6	5.1	2.8	2.8	3.6	4.4
	Rural	6.7	5.9	6.6	5.3	3.7	4.8	NA	6.3
Sierra Leone	All	5.6	5.4	5.2	4.1	3.5	2.4	1.2	4.9
	Freetown	4.2	3.9	3.5	3.7	3.4	2.4	1.0	3.2
	Other urban	4.9	3.7	4.5	3.2	2.6	2.2	1.2	3.8
	Rural	5.9	6.1	5.8	4.9	4.7	2.2	2.2	5.7
Tanzania	All	7.0	6.2	5.2	5.4	3.5	3.0	2.2	5.4
	Dar-es-Salaam	NA	NA	NA	3.5	2.9	2.9	2.8	3.1
	Other urban	6.3	4.6	4.9	4.0	3.8	3.5	2.1	4.0
	Rural	7.2	6.6	5.1	6.0	3.7	3.1	1.8	6.1
Togo	All	6.1	5.2	4.3	4.0	3.5	3.3	2.8	4.8
	Lome	4.5	4.1	4.0	3.4	3.0	3.4	2.8	3.5
	Other urban	5.4	4.4	3.0	3.5	4.1	2.4	3.0	3.9
	Rural	6.5	5.9	5.0	4.7	4.2	4.1	1.4	5.7
Uganda	All	7.0	7.0	6.5	5.8	5.1	5.1	3.6	6.2
	Kampala	NA	3.4	3.6	4.1	3.4	4.3	2.4	3.3
	Other urban	5.1	4.2	5.6	4.3	4.8	4.5	4.0	4.4
	Rural	7.2	7.3	6.8	6.4	5.9	5.8	4.6	6.8
Zambia	All	7.2	6.7	6.5	5.3	3.9	3.0	2.9	5.3
	Lusaka	5.3	5.3	5.6	3.8	3.0	2.6	2.6	3.6

	Other urban	6.5	5.2	5.2	4.0	3.5	3.0	3.2	3.9
	Rural	7.5	7.1	7.1	6.5	5.1	3.6	2.9	6.6
Zimbabwe	All	4.5	5.2	5.2	4.7	4.1	3.7	2.6	4.1
	Harare/Bulawayo	NA	3.2	5.0	2.6	3.2	3.2	2.1	3.0
	Other urban	NA	4.2	NA	3.7	2.9	3.1	2.9	3.2
	Rural	4.9	5.3	5.4	5.1	4.8	4.4	3.0	4.8

Table 2. **Children Ever Born Regressions, all women and by residence**

	All	Capital city	Other urban	Rural
Age	0.359**	0.221**	0.296**	0.423**
Age squared	-0.003**	-0.001**	-0.002**	-0.003**
Years of schooling				
0	Ref	Ref	Ref	Ref
1-5	-0.265**	-0.300**	-0.217**	-0.197**
6	-0.416**	-0.370**	-0.404**	-0.328**
7-8	-0.569**	-0.441**	-0.604**	-0.523**
9-10	-0.901**	-0.739**	-0.902**	-0.919**
11-12	-1.359**	-1.116**	-1.347**	-1516**
13+	-1.972**	-1.613**	-1.981**	-2.235**
Residence				
Rural	Ref			
Capital	-0.663**			
Other Urban	-0.413**			
Muslim	0.048**	-0.009	-0.016	0.090**
Intercept	-4.458**	-2.699**	-3.636**	-5.628**
R^2	.61	.53	.58	.62

****** Coefficient significant at the 1% level.
***** Coefficient significant at the 5% level.
[+] Coefficient significant at the 10% level.