Low Fertility, Little Modern Contraception and Women's Work: the Puzzle of Urban Africa.

Allan G. Hill, Samuel Agyei-Mensah and John K. Anarfi.

We now know that in several cities in tropical Africa, fertility is near replacement and at the same time, modern contraceptive use is uncommon. New data from Accra suggests that women are managing work and child-bearing with little disruption to their earning patterns and small costs for their health. This paper asks if this is part of a broader pattern in societies where most paid female labor is in the informal sector. Using cross-sectional and longitudinal survey data from the Women's Health Study of Accra, the paper draws attention to several notable features of Accra society including the separate living arrangements of men and women but the strongly conjoint sense of responsibility for the costs of children. With matrilineal descent, men contribute to the support of their children even through resident elsewhere. The West African patterns are distinctive and quite different from those in southern Africa.

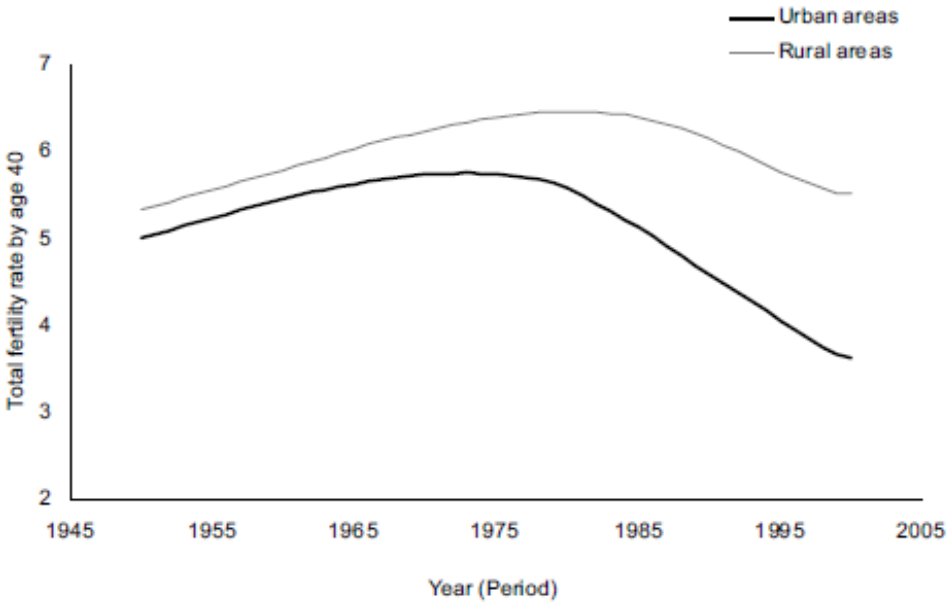
LOW FERTILITY, LITTLE MODERN CONTRACEPTION AND WOMEN'S WORK: THE PUZZLE OF URBAN AFRICA.

Allan G. Hill, Samuel Agyei-Mensah and John K. Anarfi

Introduction

For several years, individual DHS country reports and other sources have been reporting declines in cohort fertility in sub-Saharan Africa beginning in the 1950s and in period fertility from about 1980. This fertility transition was initially thought to be a feature only of countries in southern Africa (South Africa, Namibia, Botswana and Zimbabwe) but a recent comparative analysis has revealed just how widespread this transition has become Garenne (2008). The speed of fertility reduction is slow in relation to fertility changes in other regions but the early onset of decline even in rural areas from 1970 onwards in countries such as Kenya, Uganda, Niger, Malawi and Tanzania comes as more of a surprise. Even more striking are the much earlier and faster declines in urban areas (Figure 1).

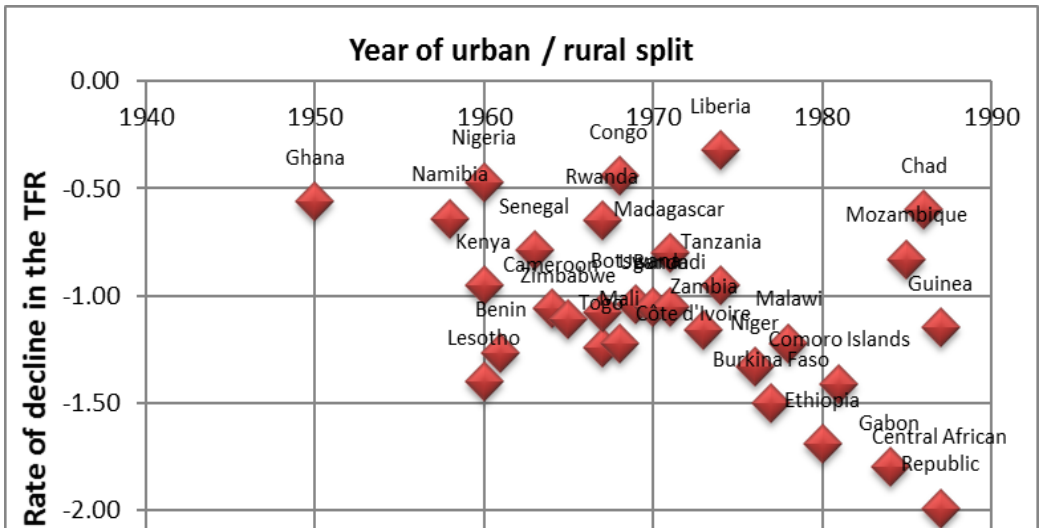
Figure 1. Trends in period fertility constructed from birth histories by urban and rural residence for 31 sub- Saharan countries 1950-2000.



The most recent DHS reports show that outside South Africa and Zimbabwe, cities as far apart as Kinshasa, Accra, Maseru, Ouagadougou, Yaoundé, Addis Ababa and Nairobi (and probably other cities for which we lack current data) have period total fertility rates below 3 children per woman. The age-specific fertility data indicate that the declines are sharpest amongst teenagers and for women aged 35 and over, signaling a shift away from the older pattern of an early age at first birth and a late age at last birth. Ages at first marriage are rising sharply but even in urban areas, the proportion of premarital births remains low (5% of births) and the proportions ever-married are still high. We know too that rates of use of modern contraception remain low so that the net effects of contraceptive use are about the same as the effects of the rising age at first marriage (Garenne 2008: table 3.4).

By examining the data from 31 African countries for the period 1950-200, we see that the overall period fertility rose slowly from about 5 to about 6 births per woman in the period before the early 1980s and then began a faster descent to under 5 births in the contemporary period (Garenne op.cit: fig 3.3). The dates for the start of the fertility decline in urban areas turn out to be much earlier. In Figure 2, constructed from these data, we see that the fall in urban fertility and the divergence from rural trends began exceptionally early in Ghana, became more widespread in Africa in the 1960s and 1970s, leaving only a few laggards (Chad, Mozambique, Guinea) in the urban fertility transition by the late 1980s.

Figure 2. The timing and speed of the decline in the period total fertility rates in 31 urban areas.



Drawn from data published in Garenne (2008) Appendix C, Table C.3. Note that these data have been assembled for countries with a series of DHS or WFS-like surveys with full birth histories.

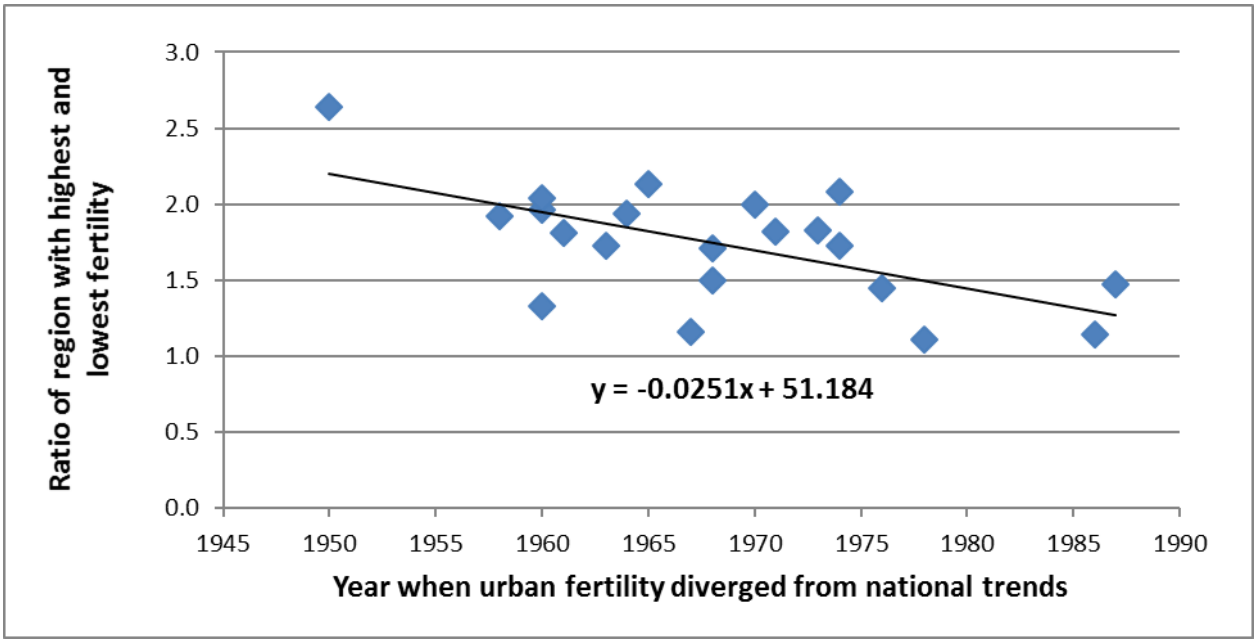
These empirical facts and particularly the new information about the early onset and widespread trend towards low fertility in urban areas present a new challenge to the full understanding of the fertility transition in Africa and to fertility theory in general. While conventional theory on the demographic transition and the broader effects of modernization would certainly point to a rapid fertility decline as a likely outcome in the faster developing urban areas, the speed of this decline as well as the mechanisms to achieve this low fertility are surprising. The long-standing debate between proponents of a largely economic set of factors and those who favour more cultural and social economic explanations has never been satisfactorily resolved, even for historical data (Haines 1986, Cleland and Wilson 1987). The economic arguments are diverse and wide-ranging but what at first seemed an appealing notion, the inter-generational wealth flow thesis, has recently been called into question by new empirical data on the costs and value of children that seem to point to systematic net downward transfer of both private and public resources to children for countries with varying levels of fertility (Willis 1982, Johnson-Hanks 2006, Johnson-Hanks, Hoelter et al. 2011). The theoretical challenge is thus how to account first for the longer, secular change in overall fertility and the faster pace of decline in urban areas which seems to persist to the present day.

In a recent review of the full corpus of DHS data on African fertility, Bongaarts and Casterline confirm that fertility in sub-Saharan Africa is indeed higher than elsewhere; that the pace of fertility decline was slower than in Asia or Latin America; and that the African distinctiveness is due to a high ideal family size together with high levels of unmet need for modern family planning. They conclude that Africans face a 'frustrated demand for contraception'(Bongaarts and Casterline 2012). Here we present a challenge to these generalizations by examining the case of Accra in some detail where fertility is close to replacement levels despite wide availability of modern contraceptives coupled with modest levels of use of these methods.

Patterns of urban fertility decline in Africa.

In 25 countries examined, the ratio of rural to urban (capital or largest city) fertility averages 1.7 for the most recent DHS surveys. The juxtaposition of low fertility in urban areas and high fertility in rural areas, often not far from the capital or largest urban area, raises fundamental questions about the geography and social dynamics of the fertility transition in contemporary Africa. Much of the writing on the determinants of fertility levels, trends and differentials concerns the immutability of the preferences of African couples for large families (Caldwell and Caldwell 1990, Caldwell 1999). New time series of data chained together from WFS, DHS and other censuses and surveys allow us to ask a number of basic theoretical questions about the drivers of fertility change in low income countries.

Figure 3. The ratio of current fertility in the rural compared to urban areas or the capital city by period when urban and rural fertility begin to diverge.



Source: Data from Garenne (2008) and Macro International Inc, 2010. MEASURE DHS STAT compiler. http://www.measuredhs.com, November 15, 2010.

From the comparative analyses, we find that without exception, urban areas and the region containing the capital city have by far the lowest fertility for the whole country. Moreover, the ratios of the highest to the lowest levels of fertility vary widely but are highest for countries in which we see the earliest divergences between urban and rural fertility trends (Figure 3).

The conclusion from this analysis is that the early start down the path towards lower fertility seems to have been a transition initiated in urban areas some time ago but that urban areas today appear to have less distinctive (lower) fertility than the countries in which the fertility transition was initiated early. This is contrary to what we might expect since if fertility reduction is anything like child mortality improvements, we might expect the later starters to move more quickly to lower levels of fertility. The suggestion is that on the contrary, starting down the path to lower fertility later does not lead to lowering fertility quickly, especially in urban areas.

In the search to account for overall and urban and rural fertility fluctuations, most models based on the conventional proximate determinants of fertility fail to account for the general rise and the secular fall of fertility over the last 50 or so years. Further modeling of the transition from the peak fertility level (ignoring prior increases or other fluctuations) produces better results with increased use of contraception accounting for 37% of the reduction in the period total fertility rate

1977-1999 and with rising age at marriage accounting for 24% of the change (Garenne, 2008: table 3.7). Interestingly, in the multi-variate model, education and income per capita contribute nothing to the overall account. What is intriguing is that the independent effect of urban residence persists even after controlling for contraceptive use, age at marriage, level of education and income per capita.

Urban areas in general have higher average incomes than rural areas, contain more educated women and provide better access to a range of services including reproductive health and family planning services. Despite these advantages and particularly the access to family planning services offered by both the public and the private sectors, modern contraceptive use is less

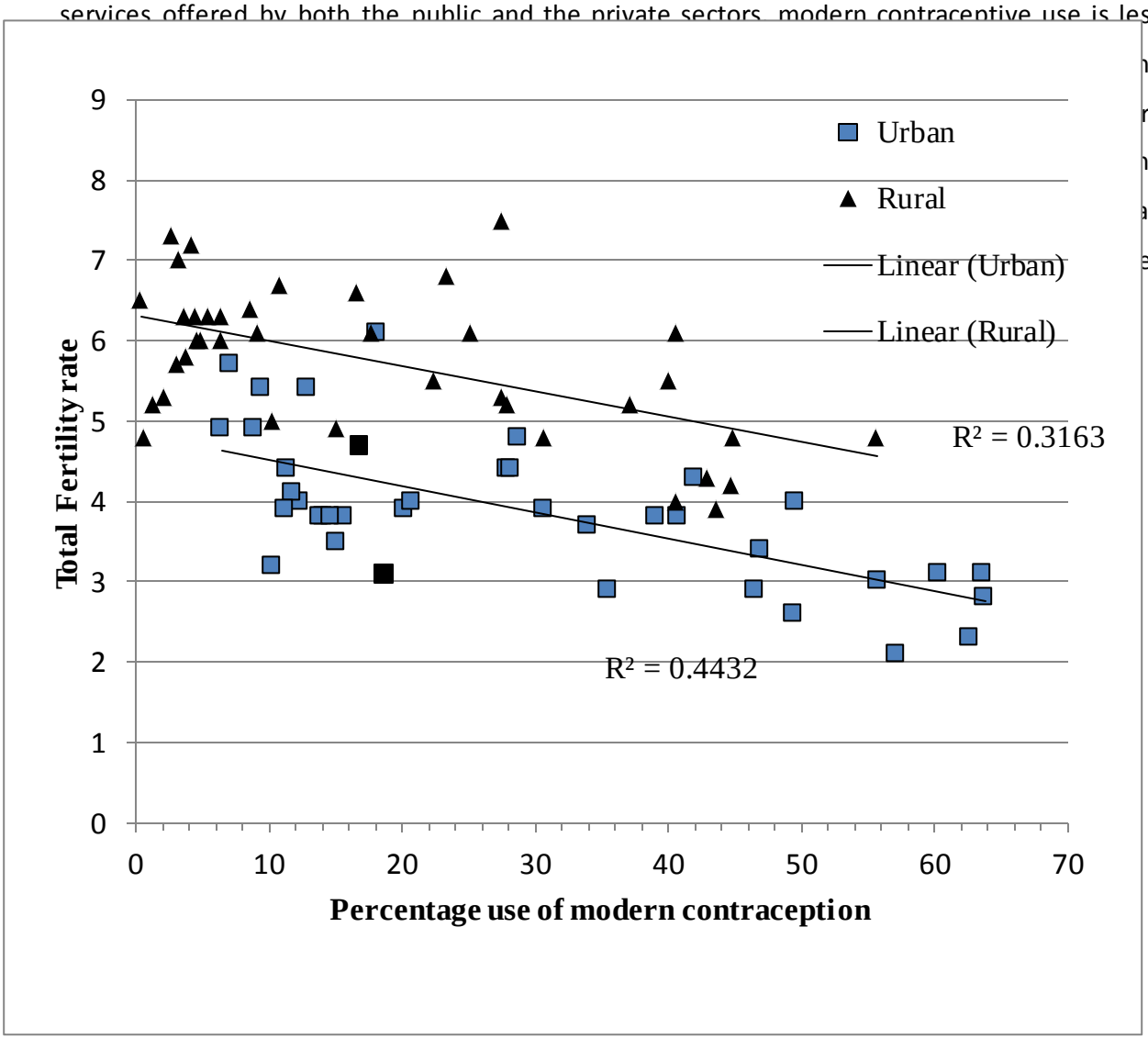


Figure 4. The total fertility rate (TFR) and prevalence of modern contraceptive use: most recent DHS surveys for sub-Saharan Africa. Ghana data marked by black squares.

Source: Measure –DHS StatCompiler.

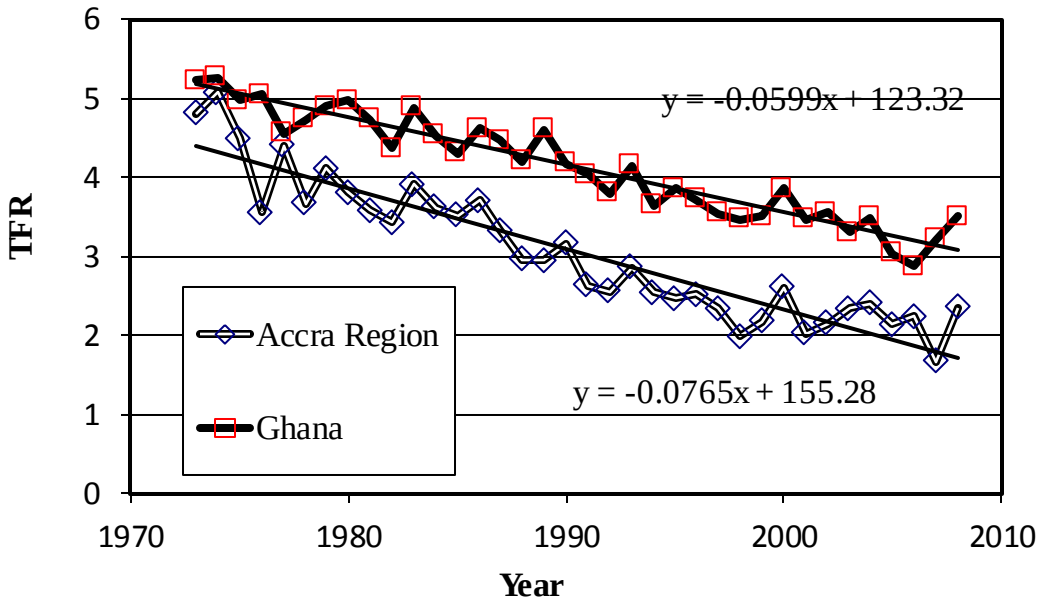
The Ghana case

To understand the mechanisms through which urban couples manage their low fertility, we turn to the Ghana case in detail. As Figure 2 illustrates, Ghana led tropical Africa in the urban fertility decline probably beginning around 1950. The rural fertility decline was delayed for some 35 years. The urban and rural fertility trends for Ghana have been very consistent over about 40 years, as Figure 5 shows[1]. For the Greater Accra region, (comprising the major urban centres of Accra and Tema), fertility has been declining steadily, reaching near-replacement levels in the latest 2008 DHS.

On the speed of the decline, we can use the series of fertility surveys from the WFS in 1979-80 to the most recent DHS in 2008 to track annual period total fertility rates for Ghana as a whole and for Greater Accra for the period 1973-2008. At the beginning of this period, urban fertility began at a lower level than the country as a whole and a much lower level than in rural areas. Since 1973, however, the urban decline has been more rapid, diverging steadily from average levels for Ghana.

[1] The total fertility rates have been derived by counting births per calendar year and women-years of exposure for individual years from a data set including both WFS and DHS data (Finlay: personal communication).

Figure 5. Calendar-year trends in the total fertility rate for Ghana and the Accra Region.



In addition to this very early divergence of rural and urban fertility levels and the tendency for countries with such an early divergence to show faster urban fertility falls (Figure 2), in Ghana we see the differentials widening towards the present day even with the much lower overall levels of fertility in the country as a whole.

Investigating urban fertility: the Women's Health Study of Accra (WHSA)

Many of the classic tools for the detailed study of period and cohort fertility trends are lacking in urban Africa. Vital registration remains incomplete even in cities, record linkage systems are lacking except in the small rural INDEPTH sites such as Kintampo, Dodowa and Navrongo and cohort studies are rare since the now standard WHS/DHS series of surveys draw new independent samples at each round. To bridge some of these information gaps, a team of researchers from ISSER, University of Ghana and Harvard University beginning in 2003 conducted a series of household health interviews amongst a representative sample of 3200 women aged 18 and over with a view to constructing one of the first panel studies in urban Africa. The first wave of the study is called the Women's Health Survey of Accra (WHSA-I) since general and reproductive health was a central focus. The sample was stratified by the socio-economic status of their Enumeration Area (EA) of residence to ensure full representativeness but older women were over-sampled with appropriate weights to provide enough cases for meaningful analysis. The follow-up study of the

same women and households – Women's Health Study, Wave II (WHSA-II) built on the detailed survey work from Wave I and was designed to obtain new empirical information on the links between health, wealth and reproduction on the household level.

With this study as a base, additional sub-studies were added within the framework of WHSA-II. The two most relevant for this analysis is the Time Use and Health Study (TUHS) and the Focused Investigations on Reproductive Health (FIRH). The TUHS included 1200 WHSA-II women in a more detailed household level survey collecting detailed information about all household members' current schooling and employment status, as well as their regular sources of income, including transfers from relatives and friends in a baseline survey. In the FIRH study, more details were obtained on reproductive health, specifically contraception, abortion, labour and delivery, and sexually transmitted infections including HIV. This study included four components. The first, in a survey of 400 women who have participated both in the WHSA waves I and II as well as the TUHS, collected data on the cost of routine reproductive health maintenance (contraception, menses management, reproductive tract and sexually transmitted infections, etc.) as well as the costs associated with the woman's most recent labour and delivery experience (Fink, Weeks et al. 2012). In the second component, focus group discussions were conducted with women of reproductive age to document community norms and knowledge around contraception and abortion. The third component comprised in-depth interviews exploring experiences of abortion among women who report having had an abortion in the WHSA-II survey. Finally, another set of in-depth interviews with women of reproductive age who report giving birth in the last five years were conducted to explore experiences of labour and delivery.

The availability of multiple sources of information on the women, involving repeat visits as well as the two major rounds of the WHSA, strengthens our faith in the accuracy of the reports concerning sensitive issues such as abortion, contraceptive use and sexual activity. In many case, the interviewers were nurses and all were adult females from the communities being interviewed. Training was careful and well supervised and office editing was rigorous so although the data are far from perfect given all the familiar difficulties with exact dates recalled retrospectively, we believe the answers provided by the women are generally of high quality.

Full details of each of these studies are available elsewhere (Oliveras, Ahiadeke et al. 2008, Adanu, Seffah et al. 2009, Weeks, Getis et al. 2010, Douptcheva and Hill 2011, Adanu, Seffah et al. 2012) . These studies form the information base for the current analysis.

***The pattern of fertility in Accra*.**

In contrast to the WFS and DHS surveys, the WHSA waves I and II both collected full pregnancy (not just birth) histories from all women over age 18 including those beyond the age of reproduction. The advantage of this approach is that we can create full histories of past reproductive trends for up to 40 or so years before the survey. The reliability of the results depends entirely on the quality of reporting of past reproductive events. Simply because of the large time lapse between the pregnancies events and the date of the survey, we can expect the reports from the oldest women, some over 65, to be of lower quality. The general effect, assuming that the rate of omission of some births rises with age, would be to under-estimate the rate of fertility change through time.

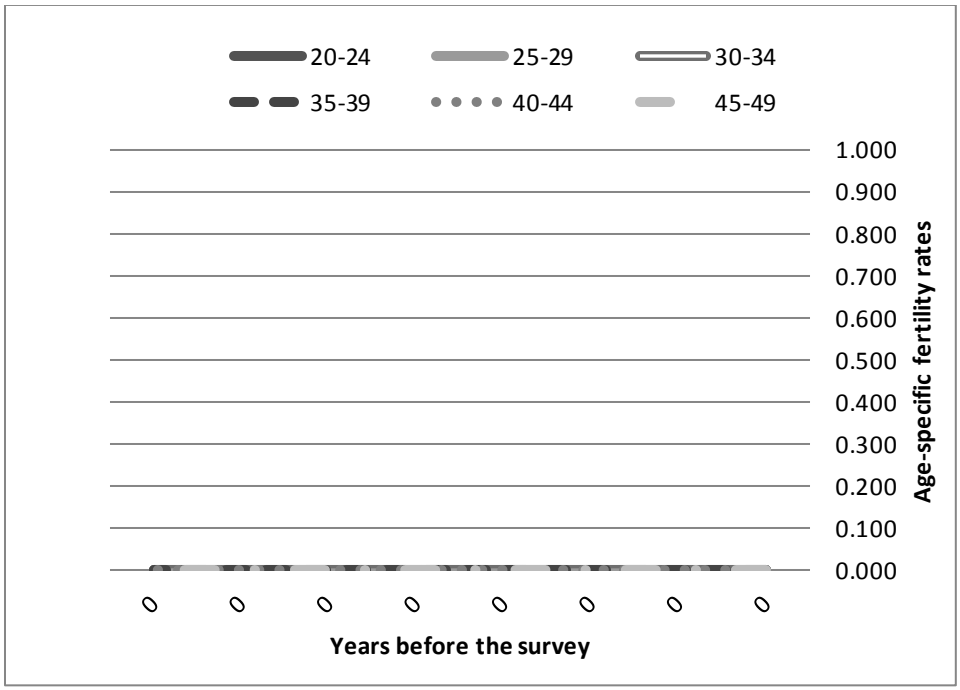
That said, we present the evidence of the steady decline in fertility for Accra women for the period before the surveys (Table 1).

Table 1. Age- and period-specific birth rates for Accra women interviewed in 2008-9.

	Years before the survey in 2008-9							
Age group	Under 5 years	6 -10 years	11 -15 years	16 -20 years	21 -25 years	26 -30 years	31 -35 years	36 –40 years
20-24	0.065	0.061	0.063	0.092	0.106	0.126	0.165	0.113
25-29	0.110	0.124	0.135	0.151	0.199	0.206	0.146	0.235
30-34	0.141	0.142	0.138	0.177	0.198	0.214	0.227	0.241
35-39	0.122	0.117	0.115	0.118	0.162	0.181	0.242	0.227
40-44	0.056	0.066	0.052	0.090	0.107	0.113	0.173	0.172
45-49	0.020	0.016	0.026	0.026	0.045	0.097	0.084	0.127
TFR	2.57	2.63	2.65	3.27	4.09	4.69	5.19	5.57

The data are more easily understood when we plot the time trends in the age-specific rates on a graph (Figure 6). As anticipated, the data are uneven for the oldest women but the downward trend in fertility is very consistent across all age groups, extending back to the 1970s. Assuming some omission of births amongst the older women, the true downward trend is likely to be steeper.

Figure 6. Trends in age-specific fertility for Accra women interviewed in 2008-9.



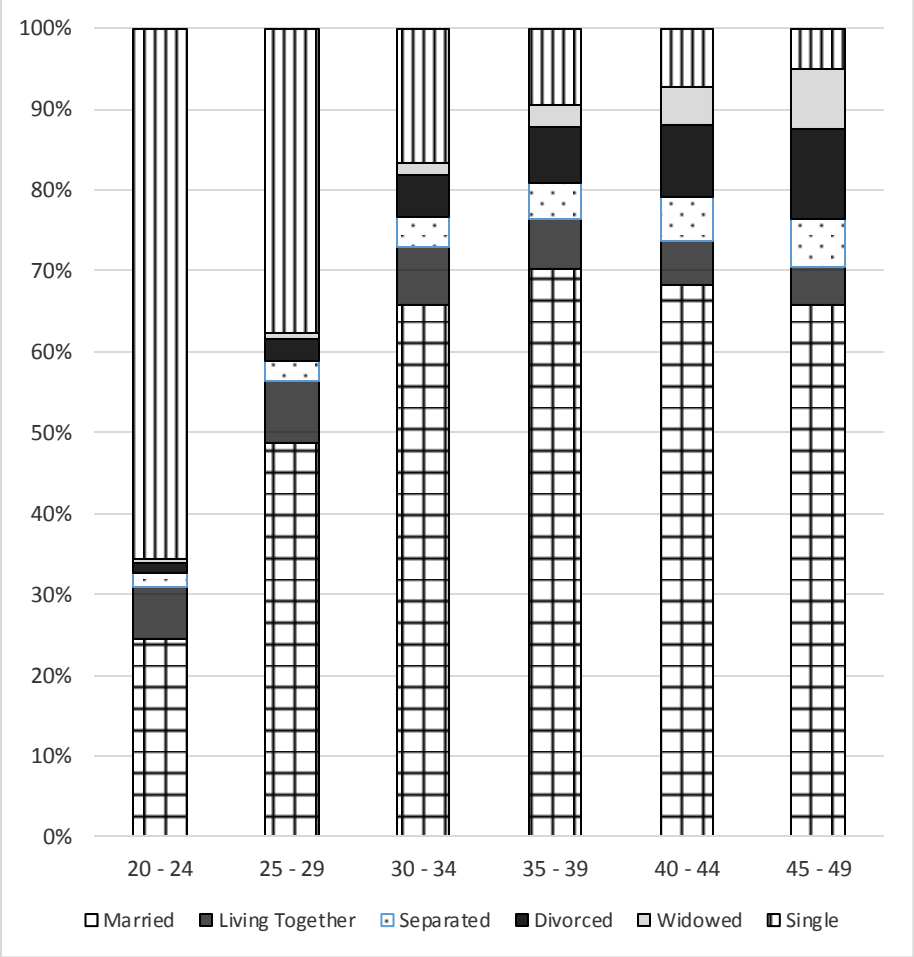
The proximate determinants

Marriage and exposure to pregnancy

There are several striking features of the patterns of marriage and cohabitation amongst the women of Accra. First, from the 2000 census, we can readily describe the marital status of women of child-bearing age (Figure 7). A surprising number remain single until their mid-20s with 38% of the 25-29 year olds still single. In the 2000 census, the singulate mean age at first marriage for Accra is 25.3 years. More striking is the number of married women not living with their husbands. In the

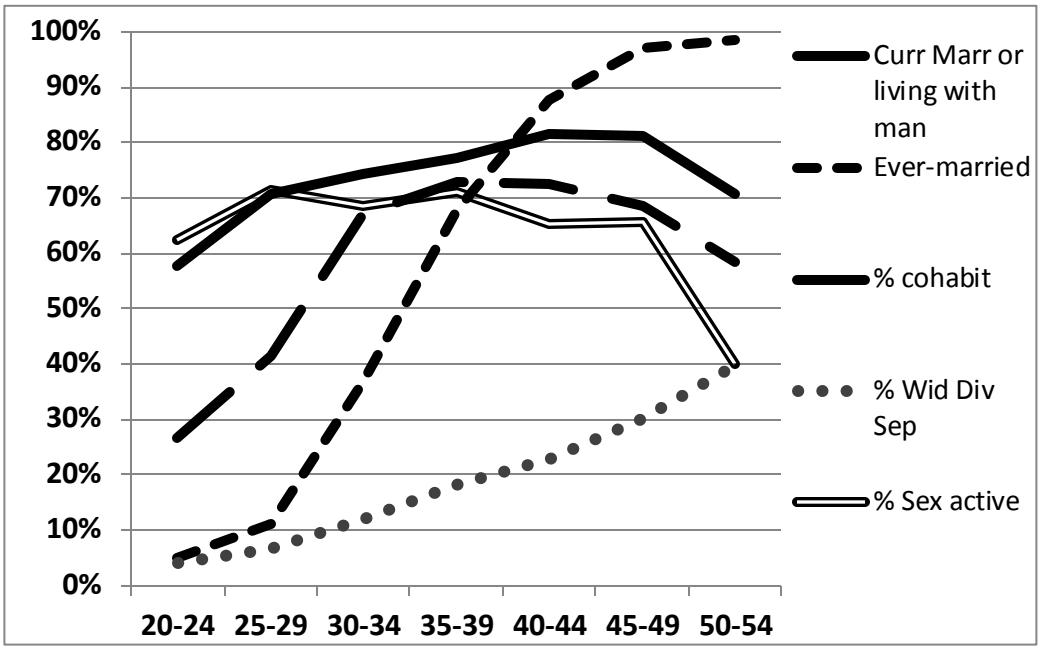
WHSA-II, 21.5% of currently married women said they were not living with their husbands. In the census, we find 15.8% of women of reproductive age said they were heads of household. Most women started their sexual careers quite young, however: the median age at first intercourse has hovered between 18 and 19 years for women of all ages at interview. There are surprisingly large fractions of women who said they were not sexually active at interview – close to 30% of women aged 25-39 said they were not sexually active with the proportion rising to 35% for the 40-49 year olds.

Figure 7. The marital status of women in the Accra Metropolitan Area; census 2000.



On a more detailed level, when we ask women about their marital status and their exposure to the risk of pregnancy, we begin to see the stark differences between the different definitions in common use. DHS, for example, when calculating contraceptive use rates, uses all married or cohabiting women as the denominator for their standard calculations. As Figure 8 shows, this definition severely under-estimates the exposure of young unmarried women to the risk of pregnancy in a population in which everyone ultimately marries. Note too how the proportions of women sexually active drop below the proportions of women either married or cohabiting at higher ages. In short, standard definitions of exposure to the risk of pregnancy are not capturing the current exposure patterns in Accra very accurately.

Figure 8. Contrasting definitions of exposure to the risk of pregnancy: WHSA II.



Using the procedures and assumptions recommended (Stover 1998), we show the values of the proximate determinants together with two contrasting definitions of exposure – the sexually active and those married or living in a union (Table 2). The major differences between the values for Cx (married and co-habiting) and Cs (sexually active) are striking, especially for younger women. The abortion rates are taken from a more detailed study (Oliveras, Ahiadeke et al. 2008) and include an allowance for a 25% under-reporting of induced abortion in the population.

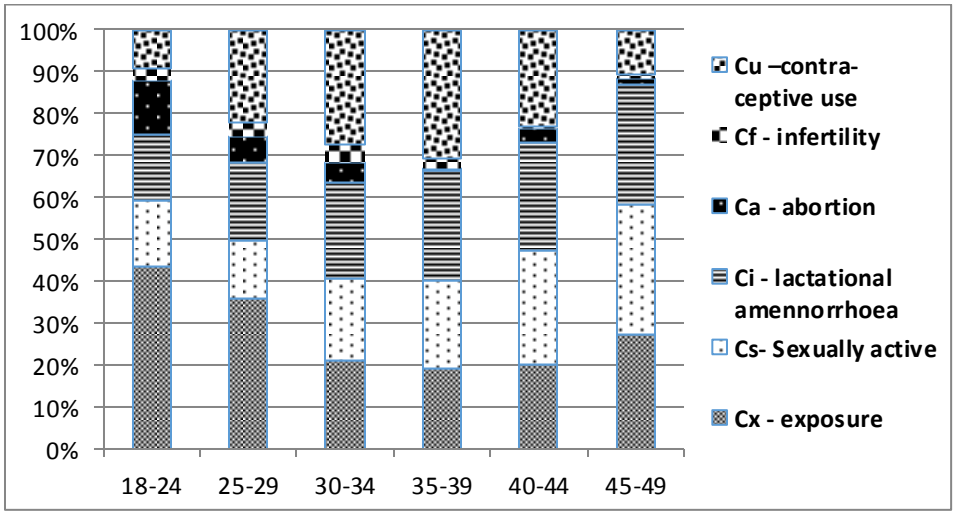
Table 2. The proximate determinants of fertility amongst Accra women: WHSA-II.

Age	Cx - exposure	Cs- Sexually active	Ci - lactational amenorrhoea	Ca - abortion	Cf - infertility	Cu –contra-ceptive use	ASFR measured
18-24	0.268	0.624	0.627	0.675	0.920	0.764	0.055
25-29	0.416	0.714	0.637	0.864	0.920	0.589	0.097
30-34	0.669	0.686	0.648	0.911	0.918	0.597	0.112

35-39	0.728	0.710	0.657	0.986	0.966	0.607	0.083
40-44	0.727	0.651	0.666	0.951	0.993	0.694	0.037
45-49	0.685	0.655	0.675	0.986	0.987	0.863	0.008
TOTAL	0.584	0.686	0.657	0.658	1.000	0.684	1.957

The size of the effect of all the main proximate determinants is shown in Figure 9. Non-exposure remains a significant factor reducing fertility throughout the reproductive years but is especially important for younger and for older women. Contraception is responsible for about a third of the reduction from potential fecundity in the middle ages of reproduction but a significant amount of this contraception is due to periodic abstinence, use of the rhythm method and withdrawal. The use-effectiveness by method analysis shows this very clearly.

Figure 9. Relative contributions of the main proximate determinants of fertility to age-specific fertility rates.



Note: Logarithms of the indices shown as percentages of the age-specific effects as the model is multiplicative.

Table 3, shows the use-effectiveness of the methods used by Accra women to partially manage their fertility. The denominators are currently married or cohabiting women as for Table 2. The overall use-effectiveness rates are low and the corresponding values of Cu (contraceptive use corrected for the overlap with sterility) are quite large, indicating not only low levels of contraceptive use but generally use of a mix of methods which are usually deemed unreliable – abstinence and withdrawal amongst them.

Table 3. Use-effectiveness (using US contraceptive use efficacy rates) for Accra women: WHSA-II.

	Pill	IUD	Injection	Implant	Male condom	Periodic abstinence	Withdraw	ALL	Cu
20-24	0.019	0.000	0.043	0.000	0.069	0.040	0.066	0.236	0.764
25-29	0.010	0.009	0.076	0.021	0.083	0.123	0.080	0.411	0.589
30-34	0.028	0.019	0.070	0.025	0.060	0.121	0.064	0.403	0.597
35-39	0.034	0.033	0.067	0.009	0.057	0.130	0.054	0.393	0.607
40-44	0.031	0.030	0.038	0.011	0.039	0.092	0.048	0.306	0.694
45-49	0.000	0.013	0.007	0.000	0.026	0.063	0.029	0.137	0.863
ALL	0.021	0.020	0.054	0.014	0.052	0.093	0.051	0.316	0.684

The avoidance of the use of the Pill is quite striking but so is the reliance on sexual restraint which seems long established and is substantiated by other measures. As indicated above, the reported mean age at first intercourse has remained at over 19 years over the whole pre-survey period. The mean number of sexual partners is 2.5 for all women - even lower for the younger cohorts of women – a stark contrast to the equivalent figures for southern Africa. As Figure 7 shows, substantial proportions of women were not married or in a union and only 69% of the women aged 20-49 said they were currently sexually active at the time of interview.

More surprising were the reports on living arrangements. Overall and for women aged 20-49, 22% reported that they and their husbands or partners lived separately, with even higher levels of separate living (42%) amongst the 20-24 year-old women, 29% amongst the 25-29 year-olds.

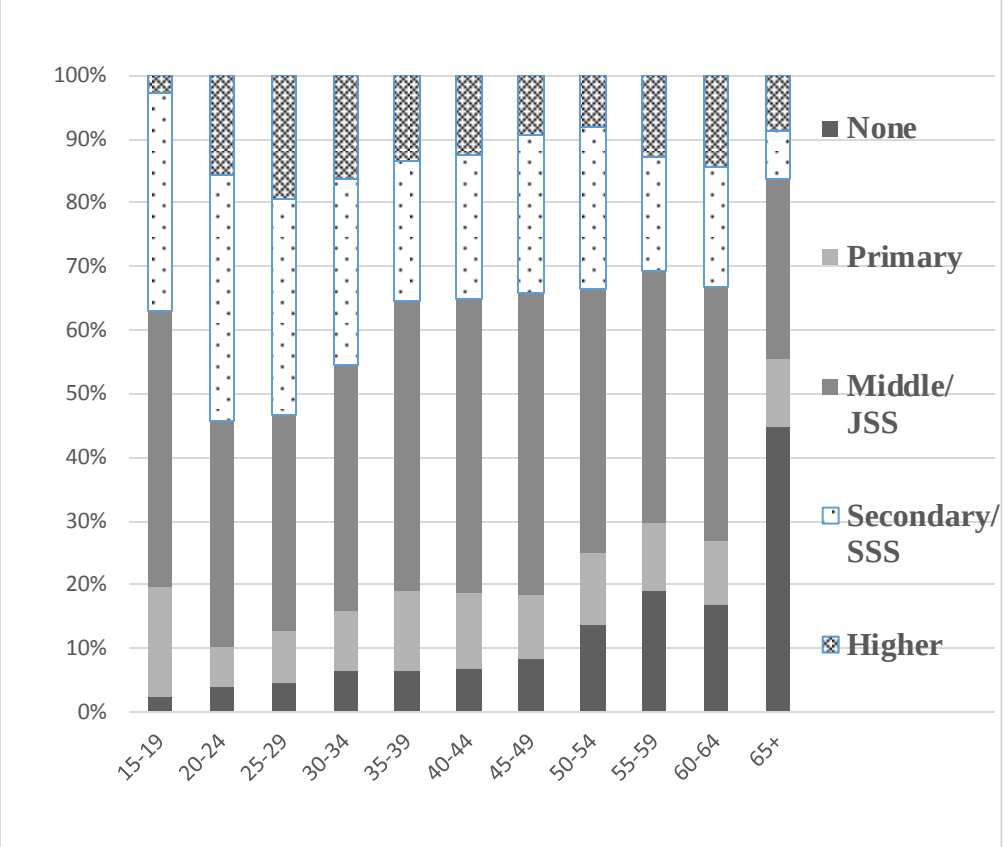
Although abortion is often cited as being widespread in Ghana and Accra in particular as explaining this gap between modern contraceptive use and realized fertility, meticulous investigation of this topic together with additional enquiries during the WHSA have not revealed very high levels of abortion use. Despite the relatively liberal legislation on induced abortion and facilities able to provide safe abortions, the total abortion rate from the survey data was just 0.307, rising to just 0.478 if it is assumed that under-reporting was as high as 50% (Oliveras, Ahiadeke et al. 2008). Thus, the best estimate of the force of the determining current fertility levels in Accra are shown in Table 2.

The overall conclusion is that the women of Accra have made a firm commitment to having fewer pregnancies and births and began this process some 40 years before the WHSA investigations. They have achieved this goal largely through local methods including a great deal of avoidance of sexual contact, by marrying late or not at all and by living apart from their husbands and partners. Why are women so determined about this course of action?

Female education.

Ghana stands out as an African country that began investing in the education of girls at an early age(Swainson 1999, Ghana n.d.). The positive correlates of educating women and girls on health, use of reproductive health services and employment levels are well-known, in addition to increasing their literacy and intellectual skills. The cohort data in the WHSA studies bear out just how important this has been even for older women. Figure 10 shows how early on the proportions of women with no education declined to low levels in Accra as well as the striking proportions of women with more than primary education. These levels of education have many important consequences for reproductive health and fertility in particular and in the survey and in the two most recent DHS reports, there was almost universal knowledge of a range of contraceptive methods. With such high levels of education, we must assume that knowledge of reproductive processes is also good – a point borne out by the in-depth enquiries in the FIRH studies. With the public health campaigns to manage the HIV/AIDS epidemic (still a localized epidemic in Ghana (Ghana 2012), public discussion of contraception and safe sex is widespread in the popular press and on the numerous FM radios broadcasting in the city.

Figure 10. Highest education level achieved by age at survey for Accra women interviewed in 2008-9.


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65+
None
Primary
Middle/ JSS
Secondary/ SSS
Higher

Women's work.

The TUHS has detailed patterns of work amongst the women of Accra and several striking features emerge. First, we find that only 13% of the women in the sub-study reported salaried work, the great majority being involved in informal forms of employment (Fink and Hill 2012). Informal employment allows more women to manage pregnancy and child care than formal, fixed hours of employment. Secondly, hours of work (defined as income-generating activities) are very long. The median number of hours worked was just under 9 hours. The link between work and parity is however rather weak. By collapsing the 10 categories of work into 6 groups: formal employment (category 1), informal employment (category 3), household work (category 4), childcare (category 5), social time (category 8) and all other, Fink and Hill (2012) were able to show several striking features of the link between work and fertility. While child care appears to have limited effects on formal employment, we find substantial effects of small children on female economic activity. On average, having an infant reduces the number of hours worked in informal jobs by 60% (1.85 hours per day). The decrease in working time appears to be mostly driven by increased work at home. On average, women with an infant spend half an hour more per day on household chores, and one hour more on child care.

These effects appear to decrease rapidly as children grow up; on average, children in the age-group 1-4 reduce the average hours worked only by 0.48, while there is no association between older children and female economic activity. What is worth noting, however, is the changing role of children in the households as they pass age 10. While women with children below age 10 spend more time doing household chores and child care, children over the age of 10 appear to commonly take on childcare duties, lowering the amount of time their mothers have to spend on childcare. Another interesting result is the negative association between sharing a home with senior adults (60+) and economic activity. On average, women co-residing with a senior adult work significantly less in both the formal and the informal sector.

The attachment of women to the labour market is very strong. The time taken off for pregnancy and early child care is quite short. One reason for this is the daily subsistence needs for households that despite Ghana's recent economic growth remain very poor. Our best estimates of the household income levels using the longitudinal data indicate that 20% of households exist on less than $1/day and a further 29% are subsisting on $1-2/day. Just 17% reported incomes over $4/day. Cash expenditures on children are very high – notably school fees and related education costs as well as health care.

The nexus: women's education and work and aspirations for children

The firmness of commitment of couples to small families is a reflection of the framework within which children are borne and reared in the urban environment. Educated parents generally aspire to produce educated offspring. As Ghana's economy has grown in complexity and sophistication, the opportunities for children with just primary and intermediate levels of education, are becoming more limited. The three years of secondary school in Ghana have never been free but at the moment the costs are escalating as a result of the addition of a number of additional charges as well as the basic tuition. For example, a typical bill for the first term in secondary school in Accra can be as high as $370 with costs for the subsequent two terms close to $263. These costs apply for the full three years of secondary school. Ordinary working-class families are stretched by these costs, yet recognise the importance of the returns to education longer term. This may explain the attachment of women to informal work which allows them to manage their pregnancies and the first few months of their babies' lives whilst reducing the hours of work only very slightly. In a situation in which large proportions of married couples live apart, the separate concerns about women's work and earnings looms rather large in a household's calculations.

We can test some of these relationships with a simple regression model. Taking the number of pregnancies rather than live births as the dependent variable, we find that controlling for age, the wealth of the household, the place of residence of the partner and the woman's education all negatively impact the total number of reported pregnancies. On the contrary, her employment status (formally or informally employed) has a net positive effect on fertility with informal employment positively affecting the number of pregnancies.

Table 4. Predicting the number of pregnancies: WHSA – II.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.860	.720		1.195	.232
Age	.089	.007	.342	13.081	.000
Household wealth	-.273	.104	-.075	-2.624	.009

Co-residence of partner	-.482	.205	-.059	-2.345	.019
Education	-.295	.087	-.099	-3.384	.001
Occupational status	.371	.289	.034	1.286	.199

Conclusions and Discussion.

The diverse information presented above on fertility in Accra makes the case that the majority of women and couples in the city are firmly committed to having small families. The reasons behind this decision are not difficult to identify. We have already drawn attention to the quite high levels of female education in the city, to the importance of economic imperatives especially for secondary school fees, and to the pattern of employment which is largely informal and thus allows the easier combination of work and childcare than with formal employment.

There are two larger questions which remain unanswered. The first concerns the choice of methods to achieve these small family sizes. In a well-educated population with relatively easy access to modern methods of contraception, the low level of use of 'modern' methods is a surprise. Couples have chosen to manage their fertility by a combination of sexual abstinence and the modest use of induced abortion. As Anarfi has indicated (Anarfi 2003) the frequent use of local herbal preparations by women when they are not really sick may be part of their secret abortion methods. We must also not lose sight to the fact that abstinence is widely practiced and seems to be employed in combination with the timing of ovulation (so-called 'rhythm' methods). There may be hidden barriers to the use of modern contraception which we have yet to identify, including worries about the side-effects of hormonal contraception or additional costs in accessing modern contraceptives that go beyond the money cost of the drugs and devices themselves.

The second unresolved question concerns the acceptability of separate living for married men and women in the city. There may be cultural supports for this pattern of living that stem from the matrilineal systems of descent and inheritance which are particularly common amongst the Akan ethnic group and exist in a modified form amongst the Ga. The TUHS study showed that there are frequent transfers across the household barriers between the men and women that live separately (Fink and Hill 2012). It seems that women expect and actually receive support for children even if the fathers live in another household. The religiosity of the Ghanaian population may also play a role here since in the general population, references to the religious support of moral behaviour are widespread. Small number of sexual partners and the general support of sexual continence are

features which probably contribute to the acceptance of separate living arrangements. Separate living for married men and women is likely to be part of the abstinence strategy. The Akans have a saying that *Nnua a eben na etwie,* that is, 'It is only when two trees are close to each other that their stems make a squeaky noise when there is a breeze'. In other words, out of sight is out of mind. The saying often features in the advice given to nursing mothers to try to avoid pregnancy when the baby is too young. Maintaining a distance is impossible when a couple are living together.

In addition to the above we need to also take into account the effect of delayed marriage, especially amongst middle and upper class women, which is affecting the timing of marriage and the first birth. Agyei-Mensah et al. (2003) have documented that upper class women in Accra postpone childbearing and marriage in pursuance of higher education and career aspirations in the future. Thus, apart from their educational backgrounds, there is an ideational element that influences reproductive behaviour. Increased knowledge about and access to contraceptive services have also given them more options for controlling their fertility. And it is likely that a significant number of those who do get pregnant have the option of resorting to abortion, most of which can be accomplished in relatively safe and hygienic conditions (Henry and Fayorsey 2002).

These ideas have enormous importance for our approach to accounting for the rather sharp fertility changes seen in many African cities. In general, the debate concerning the contribution of economic factors compared with the role of changing values and preferences (possibly independent of economic development) continues unabated. The debate has been recently rejuvenated following considerable empirical work on social effects, particularly making use of diffusion theory. Many of the ideas here are included within what is being called 'the theory of conjunctural action' that stresses the importance of social structures and associated more plastic 'schemas' in determining social actions and decision-making, especially around fertility decisions (Johnson-Hanks, Hoelter et al. 2011). Certainly, we know that education and income alone explain only part of the variations in observed fertility from place to place and even within a single country. The surprise is how different we find the proximate determinants of fertility to be in this African urban case study.

References

Adanu, R. M., J. Seffah, J. K. Anarfi, N. Lince and K. Blanchard (2012). "Sexual and Reproductive Health in Accra, Ghana." Ghana Medical Journal **46**(2): 58-65.

Adanu, R. M., J. D. Seffah, A. G. Hill, R. Darko, R. B. Duda and J. K. Anarfi (2009). "Contraceptive use by women in Accra, Ghana: results from the 2003 Accra Women's Health Survey." Afr J Reprod Health **13**(1): 123-133.

Anarfi, J. K. (2003). The Role of Local Herbs in the Recent Fertility Decline in Ghana: Contraceptives or Abortifacients? The Socio-cultural and Political Aspects of Abortion: Global Perspectives. A. Basu, Praeger**:** 139-152.

Bongaarts, J. and J. B. Casterline (2012). "Fertility transition: is sub-Saharan Africa different?" Population and Development Review **38**(Supplement): 153-168.

Caldwell, J. (1999). "Paths to lower fertility." BMJ **319**(7215): 985-987.

Caldwell, J. C. and P. Caldwell (1990). "High fertility in sub-Saharan Africa." Sci Am **262**(5): 118-125.

Cleland, J. and C. Wilson (1987). "Demand Theories of the Fertility Transition - an Iconoclastic View." Population Studies-a Journal of Demography **41**(1): 5-30.

Douptcheva, N. and A. G. Hill (2011). Final Report on the Women's Health Study of Accra, Wave II conducted in 2008-2009. . Technical Publication 91. Accra, ISSER, University of Ghana Press.

Fink, G. and A. G. Hill. (2012). "Fertility, household structure and female economic activity – evidence from the Women's Health Study of Accra." from http://www.prb.org/pdf12/poppov-economics-reproductive-health.pdf.

Fink, G., J. R. Weeks and A. G. Hill (2012). "Income and Health in Accra, Ghana: Results from a Time Use and Health Study." Am J Trop Med Hyg.

Garenne, M. (2008). "Fertility changes in sub-Saharan Africa." DHS Comparative Reports. **18**.

Ghana (2012). Ghana Country AIDS Progress Report: January 2010-December 2011. Accra, AIDS Commission.

Ghana (n.d.). A National Vision for Girl's Education in Ghana and a Framework for Action: Charting the way forward. . A SAGA Project. Accra, Education Service.

Haines, M. R. (1986). "The British Fertility Decline - Demographic-Transition in the Crucible of the Industrial-Revolution - Teitelbaum,Ms." Journal of Interdisciplinary History **16**(3): 515-517.

Johnson-Hanks, J. (2006). Uncertain honor : modern motherhood in an African crisis. Chicago, The University of Chicago Press.

Johnson-Hanks, J., L. Hoelter, R. B. King and P. J. Smock (2011). Understanding family change and variation : toward a theory of conjunctural action. Dordrecht ; New York, Springer.

Oliveras, E., C. Ahiadeke, R. M. Adanu and A. G. Hill (2008). "Clinic-based surveillance of adverse pregnancy outcomes to identify induced abortions in Accra, Ghana." Stud Fam Plann **39**(2): 133-140.

Stover, J. (1998). "Revising the proximate determinants of fertility framework: what have we learned in the past 20 years?" Stud Fam Plann **29**(3): 255-267.

Swainson, N., Ed. (1999). Redressing gender inequalities in education: A review of constraints and priorities in Malawi, Zambia and Zimbabwe. Partnership for Strategic Resource Planning for Girls' Education in Africa: Gender and Primary Schooling in Ghana. Brighton, FAWE/Institute of Development Studies.

Weeks, J. R., A. Getis, A. G. Hill, S. Agyei-Mensah and D. Rain (2010). "Neighborhoods and Fertility in Accra, Ghana: An AMOEBA-based Approach." Ann Assoc Am Geogr **100**(3): 558-578.

Willis, R. J. (1982). "The direction of intergenerational transfers and demographic transition: The Caldwell hypothesis reexamined." Population and Development Review **8**(Supplement): 207-234.