The Influence of Women's Early Childbearing on Subsequent Empowerment in sub-Saharan Africa: A Cross-National Meta Analysis

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Michelle J. Hindin*

ABSTRACT

Preventing adolescent pregnancy is a key avenue for promoting the empowerment of women and girls as well as achieving the international development agenda, such as the Millennium Development Goals. More than half of sub-Saharan African adolescents have a child, with levels ranging from 26% in Rwanda to 69% in Niger. Evidence suggests that adolescent childbearing may interrupt school attendance and impair young women's long-term social and economic mobility. Also, given the subordinate status of women in many African settings, once pregnant, young women may have limited ability to negotiate decisions around the pregnancy as well as within their relationships. Our data come from the most recent Demographic and Health Surveys in 25 sub-Saharan African nations. Using attitudes towards wife beating as a measure of empowerment, we conduct a country-by-country multivariable analysis and provide an overall assessment of our hypothesis of the influence of early childbearing on women's empowerment using meta-analysis techniques. Results show in nearly all countries that overall, women who had a birth under the age of 20 or 16 were significantly more likely to believe wife beating is justified. These results support the argument that adolescent childbearing may adversely affect future empowerment as those who began childbearing earlier have expectations of poorer status and empowerment within marital relationships.

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INTRODUCTION

Unlike other regions of the world, the fertility decline in sub-Saharan Africa appears to be moving at a slow pace. While there is evidence of steep declines throughout the region over the past 20 years, nearly all countries in sub-Saharan Africa have a fertility rate well above replacement level. Fertility declines in some countries appear to have occurred with little change in contraceptive use (e.g. Ghana) while in other countries, steep increases in modern contraceptive use have not led to equally steep declines in fertility rates (e.g. Tanzania). In addition, sub-Saharan African nations are highly heterogeneous in terms of culture, history, and political context leading to substantial variation in women's rights and abilities to decide on their fertility preferences. Preventing adolescent pregnancy is a key avenue for promoting the empowerment of women and girls as well as achieving the international development agenda, such as the Millennium Development Goals.

BACKGROUND

Adolescent Childbearing in sub-Saharan Africa

Adolescent childbearing, while still common in many settings, particularly in sub-Saharan Africa, has been declining globally for decades (Darabi, Philliber and Rosenfield 1979; Singh 1998). Research suggests that 2.2 million sub-Saharan African adolescents experience an unintended pregnancy annually (IPPF 2010) with 92% of these young women not using contraception at the time of conception (IPPF 2010). In addition, African adolescents are often unaware of sources for contraception (Biddlecom et al. 2007) and account for 25% of all unsafe abortions occurring in the region (Shah and Ahman 2010).

Based on the experiences in the United States, concerns about the impact of adolescent pregnancy in lower and middle income countries have been noted since the late 1970's (Darabi et al. 1979). These concerns were based on several arguments. First, are the biological concerns about the maternal and child health impact of early childbearing. Some evidence suggests that there is the potential for adverse health outcomes during delivery (Kongnyuy et al. 2008) for young women who begin childbearing before they are physically mature enough—particularly for the youngest adolescents (Kramer and Lancaster 2010). Young women who have unintended pregnancies may experience serious maternal morbidity and mortality from unsafe abortion (Atuyambe et al. 2005; Dahlback et al. 2007; Magadi 2006; Mitchell et al. 2006; Plummer et al. 2008) ENREF_6. Adolescent childbearing has also been linked child health outcomes including lower birth weight (Ali and

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Lulseged 1997; Kurth et al. 2010), poorer anthropometric status or smaller size (Ali and Lulseged 1997; Magadi et al. 2007a), and preterm deliveries (Magadi 2006). These findings, may, in part, be explained to poorer maternal health care seeking among adolescents (Magadi, Agwanda and Obare 2007b).

Second, evidence suggested a linkage between adolescent childbearing and interruptions in school attendance. However the direction of the association is unclear—whether poor performance in school leads to pregnancy and school dropout or whether the occurrence of a pregnancy leads to school dropout (Grant and Hallman 2008). Staying in school may also "prevent" adolescent pregnancy (Magadi and Agwanda 2009). Recent studies show that some adolescents return to school after a birth in some settings (Marteleto, Lam and Ranchhod 2008) and that pregnancy may explain only a small percentage of school dropout for adolescent girls (Lloyd and Mensch 2008). Without regard to the precise causal mechanism, it is likely that adolescent mothers can have impaired long-term social and economic mobility (Jewkes, Morrell and Christofides 2009). Also, given the subordinate status of women and established gender roles in many African settings, once pregnant, young women may have limited ability to negotiate decisions around the pregnancy as well as within their relationships (Jewkes et al. 2009; Varga 2003). In addition, if young women have less education, they are more likely to hold more conservative (less favorable) gender attitudes (Obare, Agwanda and Magadi 2006).

Attitudes Towards Violence—A Measure of Empowerment?

Since 1999-2000, the Demographic and Health Surveys has included a module on attitudes towards the acceptability of wife beating. This measure is intended as a measure of empowerment. According to Kishor and Subaiya, the questions regarding women's acceptance of wife beating measure "women's acceptance of gender-role norms that endorse the control of women by men" (Kishor and Subaiya 2008). In numerous studies, attitudes towards wife beating, a reflection of gender norms and expectations about relationship quality, have been associated with women's experience of intimate partner violence (Kishor and Johnson 2004; Klomegah 2008; Speizer 2010). Studies have also looked at the association between gender norms or measures of women's household decision-making. However, in these studies there has been an inverse association between women's positive attitudes towards wife beating and autonomy or women's status (Antai and Antai 2009;Hindin 2003; Mann and Takyi 2009).

In this manuscript, we will explore whether women's fertility (measured by adolescent childbearing) is associated with women's empowerment (or lack thereof, measured with attitudes towards wife beating). We hypothesize that adolescent childbearing will be related to more conservative, less empowered attitudes of women compared with women whose first birth occurred after adolescence.

We use the most recent round of the Demographic and Health Surveys in sub-Saharan Africa to explore our hypothesis. While perhaps the best nationally representative data source for sub-Saharan Africa, the DHS has important limitations in assessing whether lower fertility leads to greater women's empowerment. As all of the DHS for Africa are cross-sectional, sorting out the causal ordering is not possible with these data. By focusing our analysis on women who have completed their adolescence, we aim to look at a measure of fertility that precedes their current level of empowerment. While adolescent childbearing does not fully predict total fertility, it may influence young women's future options (schooling, employment) that may, in turn, influence their future empowerment.

METHODS

All of the most recent DHS surveys in sub-Saharan Africa that include attitudes towards wife beating and household decision-making (n=25) as of December 2010.

Analytic Techniques

First we developed models for each of the 25 countries included in the meta-analysis. Rather than pooling the data, we used logistic regression models within each country to get coefficients and standard errors. In each country, we limited the analytic sample to women who were past their adolescent years in order to sort some of the potential ordering between our outcome (accepting wife beating in at least one circumstance) and our exposure (having a birth under age 16 or under age 20). We used the svy command in Stata SE v. 11 to control for the complex survey design of the DHS. Details of the variables are described below.

Dependent Variables

We used whether women had a birth during their adolescent years (or earlier) as a marker for the potential adverse effects of fertility on women's empowerment. We consider both early childbearing (less than age 16) as well as during the adolescent years (less than age 20).

Key Independent Variable

Attitudes towards wife beating: Women's views about their life options, particularly surrounding sexual relationships, are one key element of their empowerment. Normative views of wife beating can provide a sense of whether women have the expectation that domestic violence is acceptable within a marriage. While attitudes and experiences of wife beating are not equivalent, we see these views as an important marker of what women expect within relationships (Hindin 2003). We developed a dichotomous measure of whether women believed that wife beating is justified in any of the five circumstances: 1) if she goes out without telling him, 2) if she neglects the children, 3) if she argues with him, 4) If she refuses to have sex with him or 5) if she burns the food.

Other Independent Variables

Birth cohort: We created a categorical variable based on age and date of interview to generate a birth cohort variable (which also serves as a measure of age). We also included education (highest level attained), wealth, rural/urban residence, and union status (married or cohabiting vs. single) for our multivariable logistic regressions.

After obtaining country-level coefficients, we outputted the data from each country (sample size, unadjusted odds ratios, standard errors, adjusted odds ratios and standard errors) to Excel. These were imported back into Stata. We ran the metanalysis command in Stata SE v.11 (metan) with random effects. These models provide a test of heterogeneity (I^2) and produce forest plots.

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In the results section we first provide a summary of the key variables for each country, then provide the forest plots for the unadjusted and adjusted models. We then show a summary table of the variables we adjusted for in each country and level of statistical significance.

RESULTS

Table 1 provides the characteristics of each of the country samples. We provide the weighted percentages based on the svy command. Overall we find that in most countries, more than half of women had a birth before age 20. Niger had the greatest proportion of births before age 20 (69%) while Rwanda was the lowest (29%). The proportion of women having a birth before age 16 is substantially lower, as expected. Having a birth before age 16 was most common in Niger and Sierra Leone (21%) while least common in Lesotho and Rwanda (<3% of women). Attitudes towards wife beating varied considerably. Only 18% of Swazi women and just over a quarter of Malawian women (27%) believed that wife beating was justified in any one of the five circumstances. In contrast, about half of the women in Benin, Cameroon, Kenya and Mozambique found wife beating acceptable in at least on circumstances. The highest rates of finding wife beating acceptable were in Burkina Faso (74%), the Democratic Republic of Congo (76%), Ethiopia (82%), Guinea (87%) and Mali (77%).

Table 1: Sample characteristics of 20-45 year old women in the most recent Demographic and Health Survey round

Country and Survey Year	N	% with a birth <20	% with a birth <16	% who believe wife beating is justified
Benin 06	14758	50.0	11.7	47.7
Burkina Faso 03	9700	58.2	8.4	73.9
Cameroon 04	7976	57.5	15.9	54.7
Democratic Republic of Congo 07	7911	49.3	10.1	76.4
Ethiopia 05	10818	56.0	17.7	82.1
Ghana 08	3875	40.4	6.9	35.4
Guinea 05	6322	60.1	16.9	87.3
Kenya 08-09	6677	50.6	10.2	51.6
Lesotho 09	5784	38.1	2.6	33.9
Liberia 09	5719	59.1	15.9	61.9
Madagascar 08-09	13341	50.4	11.0	31.4
Malawi 04	9291	63.2	13.5	27.2
Mali 06	11485	63.2	18.6	76.8
Mozambique 03	9774	61.1	18.5	53.9
Namibia 06-07	7599	36.9	5.0	34.5
Niger 06	7388	69.2	21.4	70.5
Nigeria 08	26794	46.1	15.3	43.7
Rwanda 05	8726	26.0	2.0	47.0
Senegal 05	10649	43.5	10.4	64.8
Sierra Leone 08	6111	56.5	21.2	66.5
Swaziland 06-07	3722	56.8	10.1	17.9
Tanzania 2010	7918	56.2	8.2	58.4
Uganda 06	6583	65.6	15.7	70.1
Zambia 07	5548	61.3	10.3	62.1
Zimbabwe 05-06	4439	49.2	7.1	45.5

Figure 1, a forest plot, shows the meta analysis results assessing the association between having a birth under the age of 20 and believing wife beating was acceptable in at least one circumstance. The country and survey year a shown on the far left, and the estimates and confidence intervals are plotted. We have added a line at 1 to note where there are no associations (OR=1.00). The country level odds ratios and 95% confidence intervals are shown on the right, along with the weight for each country (based on the sample size). The dotted line represents the overall odds ratio with the diamond at the bottom showing the confidence interval around the estimate.

Figure 1

Figure 1: Unadjusted association between having a birth under age 20 and acceptance of wife beating as justified
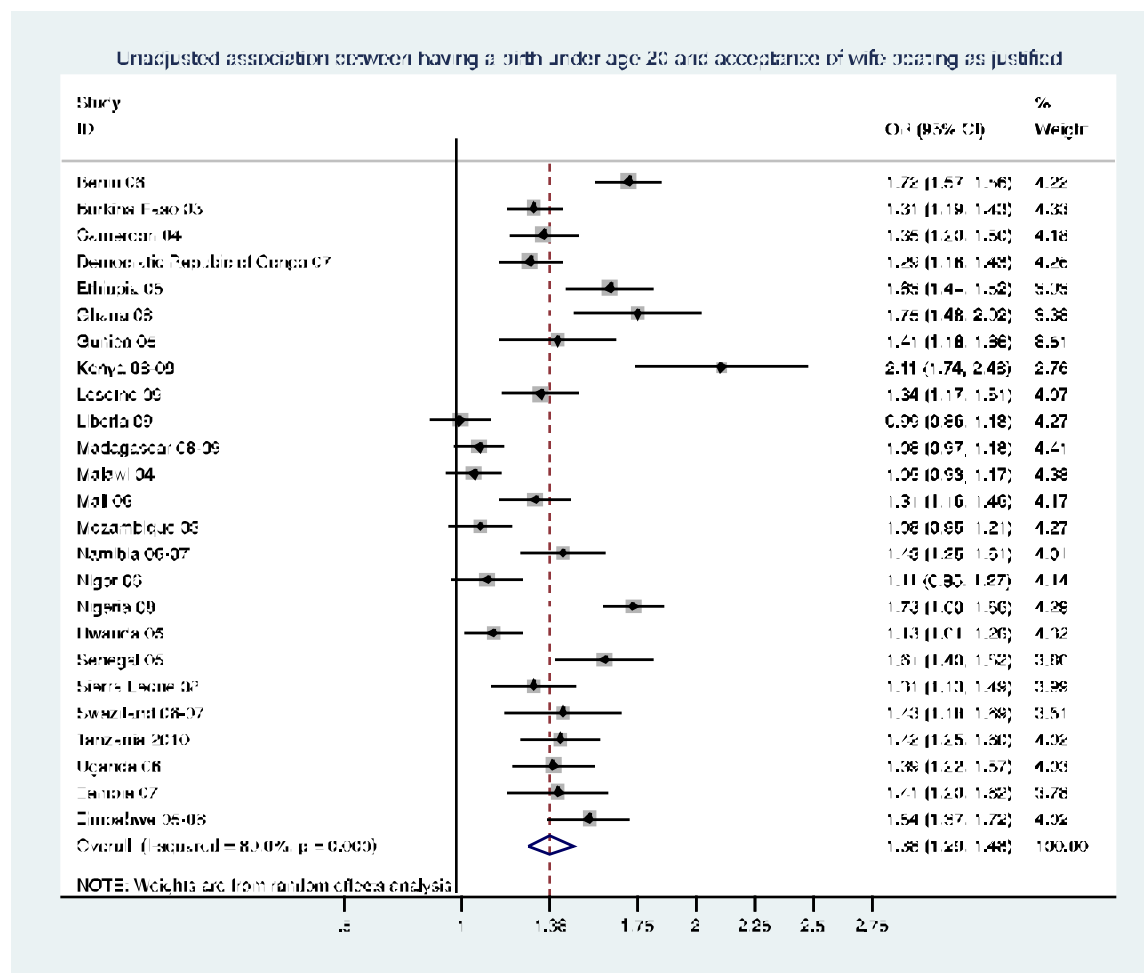
The overall result is that women who had a birth before age 20 were 1.38 times more likely to believe wife beating is acceptable (95% Confidence Interval: 1.29-1.47). However, there is significant heterogeneity between countries (I^2=89%). In five of the 25 countries there was no significant association between having a birth by age 20 and believing wife beating is acceptable. The five countries with no statistically significant effect were Liberia, Madagascar, Malawi, Mozambique and Niger.

Figure 2 shows the association between having a birth before age twenty and believing wife beating is justified after adjustment for birth cohort, wealth, educational level, rural/urban residence and union status. This analysis shows attenuation of the results. Overall, women who had an adolescent birth were 1.09 times as likely to believe wife beating is acceptable (95% Confidence interval of 1.05-1.13). The I^2 dropped to 51.5% suggesting significantly less heterogeneity between

countries than in the unadjusted model. While only three of the odds ratios fell below 1.00 (Liberia, Madagascar and Malawi), sixteen showed no statistically significant association between having an adolescent birth and believing wife beating is acceptable. Interestingly, nearly all of the statistically significant associations that remain (n=9) after adjustment are West African nations (8 of 9).

Figure 2

Adjusted association between having a birth under age 20 and acceptance of wife beating as justified
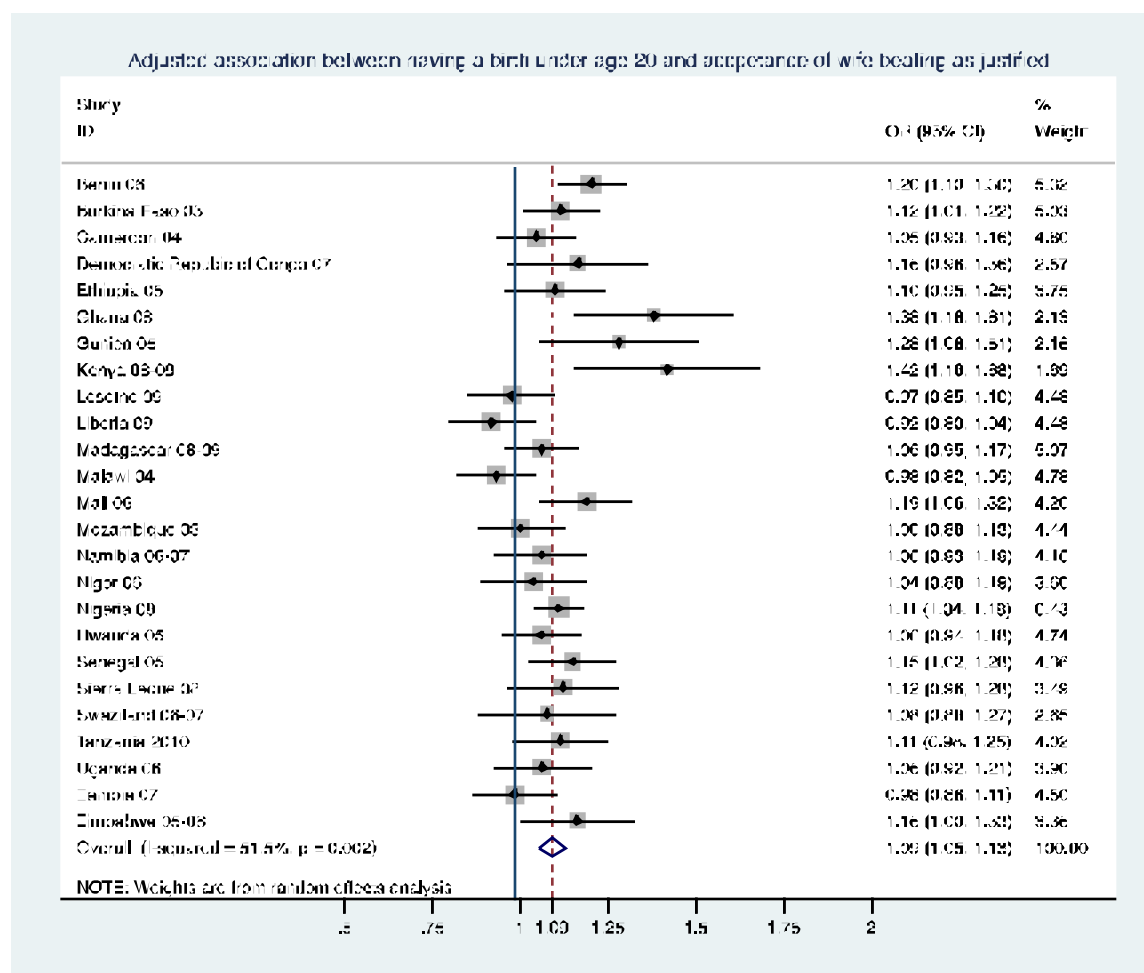
Table 2 shows the summary of the adjusted model covariates for birth before the age of 20 as associated with whether women believe wife beating is justified in at least one of five circumstances. Cohort was modeled as a categorical variable with five-year intervals. We find a statistically significant association between birth cohort (or age) in nine of the 25 countries and in general we find that the older the woman, the more likely she is to believe wife beating is justified. In many countries while the trend was positive, only a few of the levels were statistically significant which we denote by giving the variable 1-2 asterisks. Overall age is not strongly associated with

attitudes in our analysis. Education, which was operationalized as level of completed education, was statistically significantly associated with attitudes towards wife beating in all 25 countries— the more educated the woman the less likely she is to believe wife beating is justified. Wealth was inversely associated with believing wife beating is justified in 14 of the countries, positively associated with believing wife beating is justified in Guinea, and showed a non-linear association in Mozambique. In twelve of the countries, after multivariable adjustment, women living in a rural area were significantly more likely to believe wife beating is justified and in nine of the countries, women were significantly more likely to believe wife beating is justified if they were in a union.

Table 2: Summary of multivariable models for each county for the association with attitudes towards wife beating (births under age 20)

Country	N	Cohort	Education	Wealth	Rural	In Union
Benin 06	14758	NS	I ***	I ***	P ***	P ***
Burkina Faso 03	9700	NS	I***	I**	NS	NS
Cameroon 04	7976	P*	I**	I***	P**	NS
Democratic Republic of Congo 07	7911	P*	I*	I*	NS	NS
Ethiopia 05	10818	NS	I**	NS	P***	NS
Ghana 08	3875	NS	I***	I**	NS	NS
Guinea 05	6322	NS	I**	P*	P**	P*
Kenya 08-09	6677	NS	I ***	I**	NS	NS
Lesotho 09	5784	NS	I**	I***	NS	NS
Liberia 09	5752	NS	I*	NS	NS	P***
Madagascar 08-09	13341	P*	I*	NS	NS	P*
Malawi 04	9291	NS	I*	I*	P*	NS
Mali 06	11485	NS	I***	NS	NS	P**
Mozambique 03	9774	NS	I***	M**	P**	NS
Namibia 06-07	7599	P*	I***	I***	P**	NS
Niger 06	7388	P***	I**	NS	NS	NS
Nigeria 08	26794	P**	I**	I**	P**	P**
Rwanda 05	8726	NS	I**	NS	P*	NS
Senegal 05	10944	NS	I***	I*	NS	NS
Sierra Leone 08	6111	NS	I**	NS	P*	P***
Swaziland 06-07	3722	NS	I***	I**	P***	NS
Tanzania 2010	7918	P***	I**	NS	NS	NS
Uganda 06	6583	NS	I*	I*	NS	P**
Zambia 07	5548	M*	M*	I*	NS	NS
Zimbabwe 05-06	4439	P*	I***	N/A	P***	P*

***p≤0.001; p≤0.01; p≤0.05   P=positive association   I=Inverse association   M=Mixed or nonlinear association

Figure 3 shows the association between having a birth before age 16 and believing wife beating is justified in at least one circumstance before adjustment. Overall the association is statistically significant (OR=1.30, 95% CI 1.19-1.42) with substantial heterogeneity (I^2=85.3%). In ten of the 25 countries, the association is not statistically significant (Democratic Republic of Congo, Kenya, Liberia, Madagascar, Malawi, Mali, Namibia, Nigeria, Senegal and Zambia). Most of the countries where there is no statistically significant association show a positive association but have wide confidence intervals—presumably due in part to the lower frequency of under age 16 births.

Figure 3
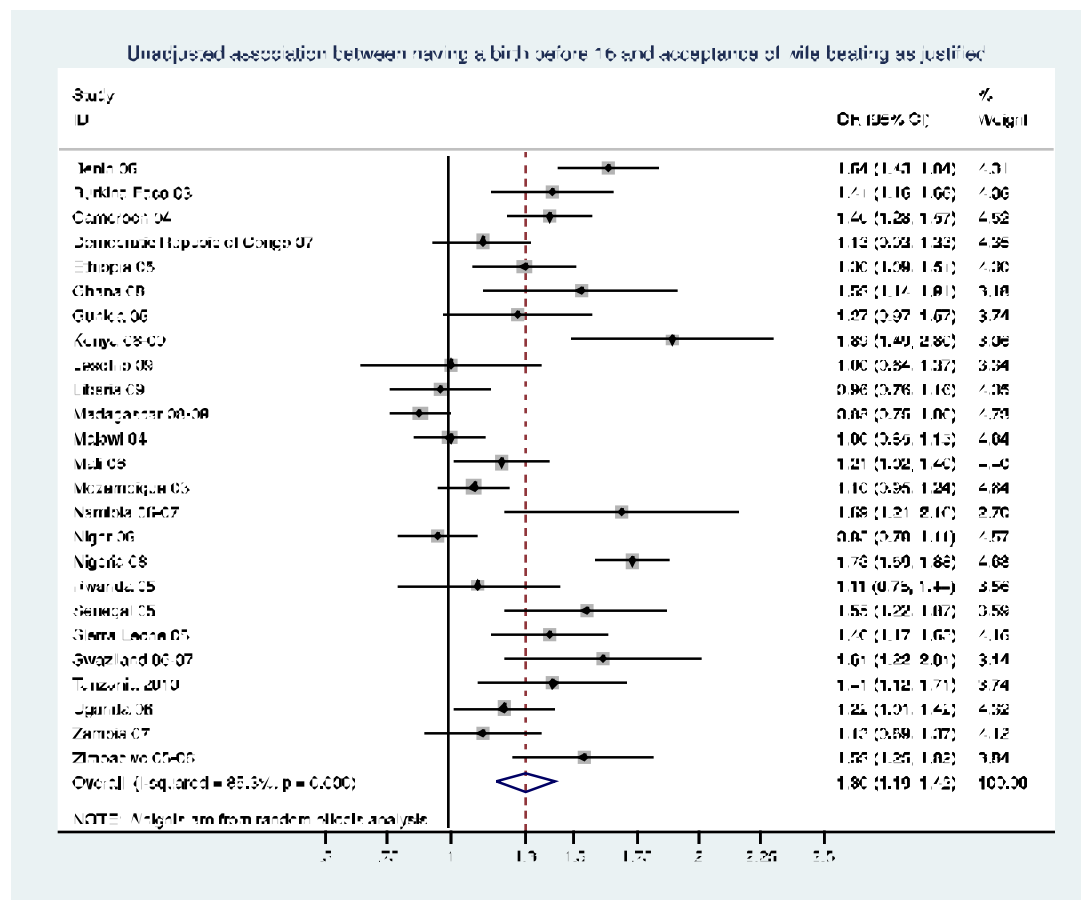
Figure 4 shows the association between having a birth under the age of 16 and believing wife beating is justified after adjustment for birth cohort, wealth, educational level, rural/urban residence and union status. Again there is substantial attenuation of the overall odds ratio (AOR: 1.09, 95% Confidence Interval 1.03-1.15). While many of the estimates show a positive association, only the following countries maintain statistical significance: Benin, Burkina Faso,

Cameroon, Kenya, Nigeria, and Sierra Leone. The model heterogeneity is substantial decreased in the adjusted model (I^2=53.7%).

Figure 4

Adjusted association between having a birth under the age of 16 and acceptance of wife beating as justified
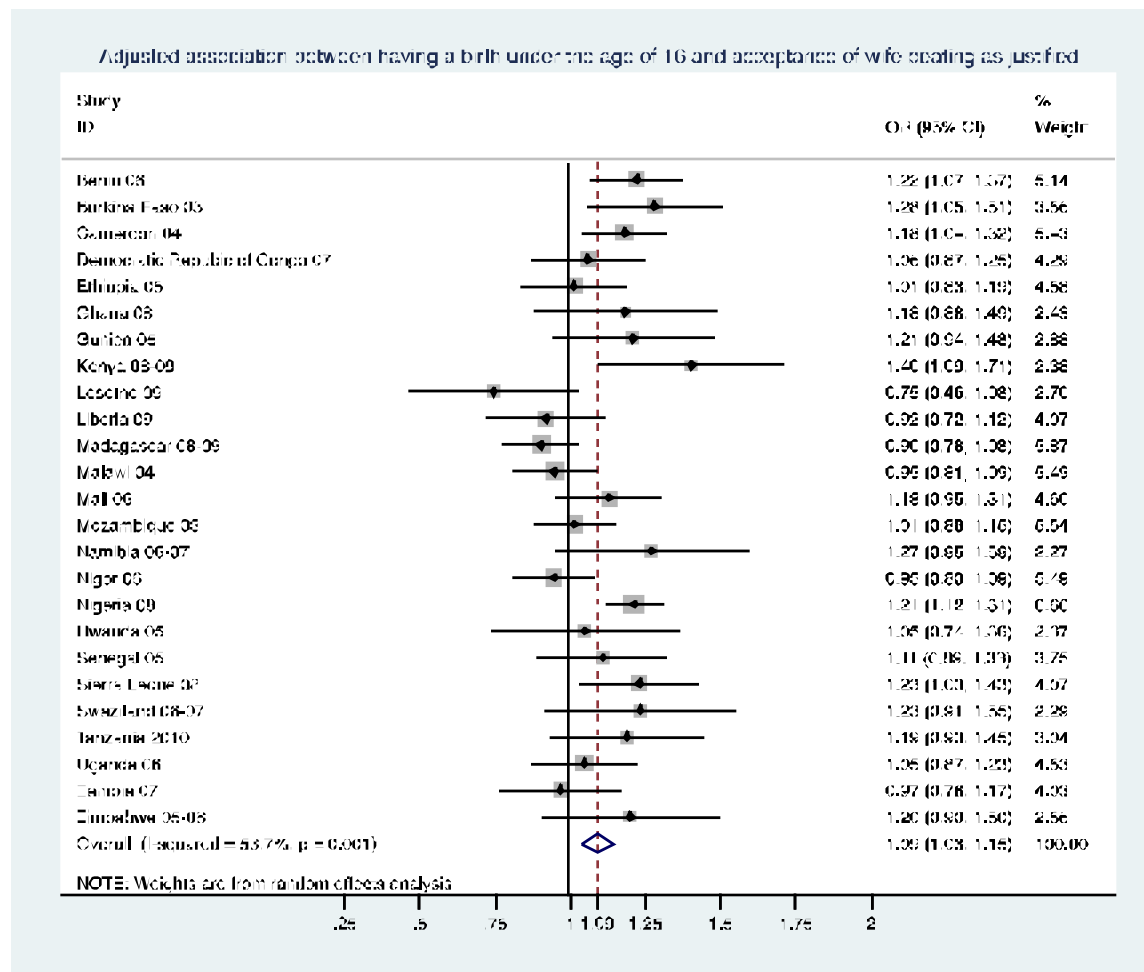
Table 3, like Table 2, summarizes the adjustment variables in the multivariable logistic regressions for each country. We find that age is positively associated with believing wife beating is justified in seven countries. Again we find that education is correlated with attitudes in every country and in nearly all, it is an inverse association. Wealth is associated with attitudes in 13 of the countries, though the strength of the association is not as strong as education and there is some heterogeneity in the patterns. In 13 countries rural residence is related to attitudes, and in general it is a positive association while being in a union is associated with wife beating attitudes in eight of the countries.

Table 3: Summary of multivariable models for each county for the association with attitudes towards wife beating (births under age 16)

Country	N	Cohort	Education	Wealth	Rural	In Union
Benin 06	14758	NS	I ***	I ***	P ***	P ***
Burkina Faso 03	9700	NS	I ***	I**	NS	NS
Cameroon 04	7976	P*	I**	I***	P**	NS
Democratic Republic of Congo 07	7911	P*	I*	I**	NS	NS
Ethiopia 05	10818	NS	I***	NS	P***	NS
Ghana 08	3875	NS	I***	I**	NS	NS
Guinea 05	6322	NS	I***	M*	P**	P*
Kenya 08-09	6677	NS	I***	I**	P*	NS
Lesotho 09	5784	NS	I ***	I ***	NS	NS
Liberia 09	5752	NS	I*	NS	NS	P***
Madagascar 08-09	13341	P*	I*	NS	NS	P*
Malawi 04	9291	NS	P***	NS	NS	NS
Mali 06	11485	NS	I***	NS	NS	P**
Mozambique 03	9774	NS	I**	P**	P**	NS
Namibia 06-07	7599	NS	I**	I**	I**	NS
Niger 06	7388	P**	I**	NS	NS	NS
Nigeria 08	26794	P**	I**	I*	P**	P***
Rwanda 05	8726	NS	I***	NS	P*	NS
Senegal 05	10944	NS	I***	NS	NS	NS
Sierra Leone 08	6111	NS	I**	NS	P*	P***
Swaziland 06-07	3722	NS	I**	I*	P***	NS
Tanzania 2010	7918	P***	I**	NS	NS	NS
Uganda 06	6583	NS	I*	NS	P*	P**
Zambia 07	5548	NS	M*	I*	NS	NS
Zimbabwe 05-06	4439	P*	I**	N/A	P***	P*

***p≤0.001; p≤0.01; p≤0.05   P=positive association   I=Inverse association   M=Mixed or nonlinear association

DISCUSSION

The analyses show that in the 25 sub-Saharan African countries studied, there is an association between having a birth under the age of 20 or under the age of 16 and believing that wife beating is justified in at least one circumstance. While the magnitude of the association is relatively small, it remains statistically significant after multivariable adjustment. These results suggest that women who have a birth at a younger age are more likely to later hold more conservative attitudes about women's empowerment and perhaps their own relationships in terms of expectations of experiencing domestic violence in marriage.

This is one of the first papers to explore this association. We find that sub-Saharan Africa is heterogeneous in terms of the timing of first birth, although in many of the countries it occurs before age 20 for more than half of the women. Niger has the greatest proportion of women having a birth under the age of 20 (69%) while Rwanda has the smallest proportion (26%). As expected births under the age of 16 are substantially less common but again vary widely by country—Niger is again the highest followed closely by Sierra Leone (21%) while Rwanda is again the lowest (2%), followed by Lesotho (3%), Namibia (5%) and Ghana and Zimbabwe (7%). It is interesting to find that there is not a clear relationship between economic development and adolescent pregnancy—although this warrants a more detailed examination.

In addition, it is worth noting the heterogeneity of women believing wife beating is justified— ranging from a low of 18% in Swaziland to a high of 82% in Ethiopia. Somewhat surprisingly, in more than half of the countries, well over half the women believe wife beating is justified. The lack of a socially desirable response in a face-to-face interview for many women is noteworthy.

When considering the multivariable analyses within each country, it is evident that education is one of the leading factors that attenuate the association between having a birth during adolescence and attitudes towards wife beating. It is possible that controlling for education is in fact over adjusting the models. Education, as described in the literature review. is tied to adolescent pregnancy—in many settings pregnancy necessitates school dropout. It is also possible that poor school performance may lead to a lack of motivation, engaging in high risk behaviors, and then pregnancy and school dropout. It is also possible that those who drop out of school are at high risk of early pregnancy. Without strong longitudinal data, it is impossible to sort out the causal ordering of these events unless the gap between events is substantial. These issues are a clear limitation of the

current work. Cross-sectional data like the DHS surveys, even if a calendar was provided, may not be able to sort out the order of these events. Further work on this topic is clearly needed.

It is also noteworthy that we did not find significant or consistent associations between women's decision-making power and adolescent pregnancy (data not shown). In part, we believe this reflects the considerable debate as to whether women should be "autonomous"—making decisions on their own or strive for joint decisions with their partners. Autonomy and empowerment are not equivalent concepts, and while autonomy may be a subset of the multidimensional concept of empowerment, we felt looking at gender norms or attitudes was a better assessment of the potential relation between fertility and empowerment. We also considered the questions on attitudes towards refusing sex, but unfortunately those measures existed in a minor of the surveys.

Like all other studies using Demographic and Health surveys data, the results presented are limited to what can be gained with cross-sectional data. Longitudinal analyses may better inform the research question—particularly in regards to the timing of schooling completion and pregnancy. In addition, we limited our analyses to the most recently available surveys, and those that included the attitudinal questions of interest. Results are not generalizable over time or to the countries that were not included.

Despite these limitations and the significant heterogeneity of sub-Saharan African nations on the key variables of interest, along with differences in social and economic development, we do find a statistically significant association between adolescent childbearing and attitudes towards wife beating. These findings are robust to multivariable adjustment. As noted in our work (Hindin 2003) and the work of others (Speizer 2010; Uthman, Lawoko and Moradi 2009) , what is most concerning about looking at norms surrounding wife beating is that until women expect violence-free relationships, it is difficult to think about appropriate interventions to decrease intimate partner violence. Our results support the argument that adolescent childbearing may adversely affect future empowerment as those who began childbearing earlier have expectations of poorer status and empowerment within marital relationships.

Appendix 1: Under 20 Data (Unadjusted)

Study	ES	[95% Conf. Interval]		% Weight
Benin 06	1.715	1.573	1.857	4.22
Burkina Faso 03	1.309	1.189	1.428	4.33
Cameroon 04	1.348	1.200	1.496	4.18
Democratic Republic Congo	1.293	1.158	1.427	4.26
Ethiopia 05	1.634	1.443	1.825	3.93
Ghana 08	1.751	1.479	2.024	3.38
Guinea 05	1.410	1.156	1.663	3.51
Kenya 08-09	2.110	1.742	2.478	2.76
Lesotho 09	1.338	1.171	1.506	4.07
Liberia 09	0.994	0.861	1.127	4.27
Madagascar 08-09	1.075	0.971	1.179	4.41
Malawi 04	1.053	0.933	1.172	4.33
Mali 06	1.314	1.164	1.464	4.17
Mozambique 03	1.082	0.949	1.214	4.27
Namibia 06-07	1.432	1.254	1.610	4.01
Niger 06	1.110	0.955	1.266	4.14
Nigeria 08	1.732	1.604	1.861	4.29
Rwanda 05	1.135	1.012	1.258	4.32

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Senegal 05                  |  1.611      1.400     1.821          3.80

Sierra Leone 08             |  1.307      1.127     1.487          3.99

Swaziland 06-07             |  1.435      1.181     1.688          3.51

Tanzania 2010               |  1.421      1.246     1.596          4.02

Uganda 06                   |  1.392      1.218     1.567          4.03

Zambia 07                   |  1.412      1.199     1.625          3.78

Zimbabwe 05-06              |  1.544      1.368     1.720          4.02

-------------------+-------------------------------------------

D+L pooled ES               |  1.382      1.285     1.478        100.00

-------------------+-------------------------------------------


  Heterogeneity chi-squared = 218.50  (d.f. = 24) p = 0.000

  I-squared  (variation in ES attributable to heterogeneity) =  89.0%

  Estimate of between-study variance Tau-squared =  0.0518



  Test of ES=0 : z=  28.17 p = 0.000
```

Appendix 1: Under 20 Data (Adjusted)

```
       Study              |    ES    [95% Conf. Interval]    % Weight
-------------------+-------------------------------------------------
Benin 06                  |  1.204    1.104    1.303           5.32

Burkina Faso 03           |  1.117    1.010    1.225           5.03

Cameroon 04               |  1.046    0.932    1.160           4.80

Democratic Republic Congo |  1.164    0.965    1.364           2.57

Ethiopia 05               |  1.099    0.952    1.246           3.75

Ghana 08                  |  1.384    1.156    1.611           2.13

Guinea 05                 |  1.281    1.055    1.506           2.16

Kenya 08-09               |  1.420    1.156    1.684           1.69

Lesotho 09                |  0.975    0.850    1.099           4.43

Liberia 09                |  0.920    0.795    1.045           4.43

Madagascar 08-09          |  1.061    0.954    1.167           5.07

Malawi 04                 |  0.932    0.817    1.046           4.78

Mali 06                   |  1.189    1.057    1.321           4.20

Mozambique 03             |  1.002    0.877    1.126           4.44

Namibia 06-07             |  1.060    0.927    1.194           4.16

Niger 06                  |  1.038    0.885    1.190           3.60

Nigeria 08                |  1.110    1.038    1.182           6.43

Rwanda 05                 |  1.060    0.944    1.176           4.74

Senegal 05                |  1.149    1.022    1.276           4.36
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Sierra Leone 08         |  1.122     0.965     1.278          3.49

Swaziland 06-07         |  1.076     0.881     1.272          2.65

Tanzania 2010           |  1.114     0.976     1.251          4.02

Uganda 06               |  1.063     0.921     1.205          3.90

Zambia 07               |  0.984     0.862     1.107          4.50

Zimbabwe 05-06          |  1.164     1.001     1.326          3.36

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D+L pooled ES           |  1.090     1.051     1.128        100.00

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Heterogeneity chi-squared = 49.54 (d.f. = 24) p = 0.002

I-squared (variation in ES attributable to heterogeneity) = 51.5%

Estimate of between-study variance Tau-squared = 0.0047

Test of ES=0 : z= 55.46 p = 0.000

Appendix 2: Under 16 data (Unadjusted)

Study		ES	[95% Conf. Interval]		% Weight
Benin 06		1.636	1.428	1.844	4.31
Burkina Faso 03		1.411	1.163	1.660	4.06
Cameroon 04		1.399	1.229	1.569	4.52
Democratic Republic Congo		1.130	0.931	1.330	4.35
Ethiopia 05		1.299	1.090	1.508	4.30
Ghana 08		1.525	1.136	1.914	3.18
Guinea 05		1.270	0.972	1.569	3.74
Kenya 08-09		1.895	1.486	2.304	3.06
Lesotho 09		1.002	0.639	1.365	3.34
Liberia 09		0.962	0.761	1.163	4.35
Madagascar 08-09		0.877	0.752	1.002	4.73
Malawi 04		1.000	0.853	1.146	4.64
Mali 06		1.207	1.016	1.398	4.40
Mozambique 03		1.097	0.952	1.242	4.64
Namibia 06-07		1.688	1.213	2.163	2.70
Niger 06		0.949	0.789	1.108	4.57
Nigeria 08		1.733	1.586	1.881	4.63
Rwanda 05		1.112	0.784	1.440	3.56
Senegal 05		1.545	1.222	1.868	3.59

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Sierra Leone 08          |   1.401      1.169     1.634          4.16

Swaziland 06-07          |   1.613      1.217     2.009          3.14

Tanzania 2010            |   1.414      1.115     1.712          3.74

Uganda 06                |   1.215      1.009     1.421          4.32

Zambia 07                |   1.129      0.891     1.367          4.12

Zimbabwe 05-06           |   1.535      1.251     1.819          3.84

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D+L pooled ES            |   1.301      1.187     1.416        100.00

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  Heterogeneity chi-squared = 162.82  (d.f. = 24) p = 0.000

  I-squared  (variation in ES attributable to heterogeneity) =  85.3%

  Estimate of between-study variance Tau-squared =  0.0683



  Test of ES=0 : z=  22.23 p = 0.000
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Appendix 2: Under 16 data (Adjusted)

Study		ES	[95% Conf. Interval]		% Weight
Benin 06		1.220	1.066	1.374	5.14
Burkina Faso 03		1.281	1.053	1.508	3.56
Cameroon 04		1.181	1.038	1.324	5.43
Democratic Republic Congo		1.058	0.868	1.249	4.29
Ethiopia 05		1.012	0.835	1.190	4.58
Ghana 08		1.184	0.876	1.491	2.43
Guinea 05		1.210	0.939	1.481	2.88
Kenya 08-09		1.403	1.092	1.714	2.38
Lesotho 09		0.747	0.462	1.031	2.70
Liberia 09		0.918	0.718	1.119	4.07
Madagascar 08-09		0.902	0.776	1.028	5.87
Malawi 04		0.947	0.806	1.087	5.49
Mali 06		1.129	0.952	1.306	4.60
Mozambique 03		1.015	0.876	1.153	5.54
Namibia 06-07		1.270	0.948	1.592	2.27
Niger 06		0.945	0.804	1.086	5.49
Nigeria 08		1.212	1.115	1.308	6.66
Rwanda 05		1.050	0.737	1.362	2.37

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Senegal 05                    |  1.108     0.891     1.325          3.75

Sierra Leone 08               |  1.229     1.028     1.429          4.07

Swaziland 06-07               |  1.234     0.914     1.554          2.29

Tanzania 2010                 |  1.188     0.928     1.447          3.04

Uganda 06                     |  1.047     0.868     1.227          4.53

Zambia 07                     |  0.967     0.764     1.170          4.03

Zimbabwe 05-06                |  1.201     0.905     1.497          2.56

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D+L pooled ES                 |  1.091     1.034     1.148        100.00

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  Heterogeneity chi-squared =  51.83  (d.f. = 24) p = 0.001

  I-squared  (variation in ES attributable to heterogeneity) =  53.7%

  Estimate of between-study variance Tau-squared =  0.0102



  Test of ES=0 : z=  37.54 p = 0.000
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REFERENCES

Ali, M.and S. Lulseged. 1997. "Factors influencing adolescent birth outcome." *Ethiopian medical journal* 35 (1):35-42.

Antai, D.and J. Antai. 2009. "Collective violence and attitudes of women toward intimate partner violence: Evidence from the Niger Delta." *Bmc International Health and Human Rights* 9.

Atuyambe, L., F. Mirembe, A. Johansson, E.K. Kirumira, and E. Faxelid. 2005. "Experiences of pregnant adolescents--voices from Wakiso district, Uganda." *African health sciences* 5 (4):304-309.

Biddlecom, A.E., A. Munthali, S. Singh, and V. Woog. 2007. "Adolescents' views of and preferences for sexual and reproductive health services in Burkina Faso, Ghana, Malawi and Uganda." *African journal of reproductive health* 11 (3):99-110.

Dahlback, E., M. Maimbolwa, L. Kasonka, S. Bergstrom, and A.B. Ransjo-Arvidson. 2007. "Unsafe induced abortions among adolescent girls in Lusaka." *Health care for women international* 28 (7):654-676.

Darabi, K.F., S.G. Philliber, and A. Rosenfield. 1979. "A perspective on adolescent fertility in developing countries." *Studies in family planning* 10 (10):300-303.

Grant, M.J.and K.K. Hallman. 2008. "Pregnancy-related school dropout and prior school performance in KwaZulu-Natal, South Africa." *Studies in family planning* 39 (4):369-382.

Hindin, M.J. 2003. "Understanding women's attitudes towards wife beating in Zimbabwe." *Bulletin of the World Health Organization* 81 (7):501-508.

IPPF, G.I.a. 2010. "Facts on the Sexual and Reproductive Health of Adolescent Women in the Developing World." Guttmacher Institute.

Jewkes, R., R. Morrell, and N. Christofides. 2009. "Empowering teenagers to prevent pregnancy: lessons from South Africa." *Culture, health & sexuality* 11 (7):675-688.

Kishor, S.and K. Johnson. 2004. "Profiling Domestic Violence – A Multi-Country Study." Calverton, Maryland: ORC Macro.

Kishor, S.and L. Subaiya. 2008. "Understanding Women's Empowerment: A Comparative Analysis of Demographic and Health Surveys (DHS) Data." in *DHS Comparative Reports*. Calverton, Maryland: Macro International Inc.

Klomegah, R.Y. 2008. "Intimate Partner Violence (IPV) in Zambia: An Examination of Risk Factors and Gender Perceptions." *Journal of Comparative Family Studies* 39 (4):557-+.

Kongnyuy, E., P. Nana, N. Fomulu, S. Wiysonge, L. Kouam, and A. Doh. 2008. "Adverse Perinatal Outcomes of Adolescent Pregnancies in Cameroon." *Maternal and child health journal* 12 (2):149-154.

Kramer, K.L.and J.B. Lancaster. 2010. "Teen motherhood in cross-cultural perspective."

Annals of Human Biology 37 (5):613-628.

Kurth, F., S. Belard, G. Mombo-Ngoma, K. Schuster, A.A. Adegnika, M.K. Bouyou-Akotet, P.G. Kremsner, and M. Ramharter. 2010. "Adolescence As Risk Factor for Adverse Pregnancy Outcome in Central Africa-- A Cross-Sectional Study." *PloS one* 5 (12):e14367.

Lloyd, C.B.and B.S. Mensch. 2008. "Marriage and childbirth as factors in dropping out from school: an analysis of DHS data from sub-Saharan Africa." *Population studies* 62 (1):1-13.

Magadi, M. 2006. "Poor pregnancy outcomes among adolescents in South Nyanza region of Kenya." *African journal of reproductive health* 10 (1):26-38.

Magadi, M., A. Agwanda, F. Obare, and N. Taffa. 2007a. "Size of newborn and caesarean section deliveries among teenagers in sub-Saharan Africa: Evidence from DHS." *Journal of biosocial science* 39 (02):175-187.

Magadi, M.A. and A.O. Agwanda. 2009. "Determinants of transitions to first sexual intercourse, marriage and pregnancy among female adolescents: evidence from South

Nyanza, Kenya." *Journal of biosocial science* 41 (3):409-427.

Magadi, M.A., A.O. Agwanda, and F.O. Obare. 2007b. "A comparative analysis of the use of maternal health services between teenagers and older mothers in sub-Saharan Africa: Evidence from Demographic and Health Surveys (DHS)." *Social science & medicine* 64 (6):1311-1325.

Mann, J.R. and B.K. Takyi. 2009. "Autonomy, dependence or culture: Examining the impact of resources and socio-cultural processes on attitudes towards intimate partner violence in Ghana, Africa." *Journal of Family Violence* 24 (5):323-335.

Marteleto, L., D. Lam, and V. Ranchhod. 2008. "Sexual behavior, pregnancy, and schooling among young people in urban South Africa." *Studies in family planning* 39 (4):351-368.

Mitchell, E.M., C.T. Halpern, E.M. Kamathi, and S. Owino. 2006. "Social scripts and stark realities: Kenyan adolescents' abortion discourse." *Culture, health & sexuality* 8 (6):515-528.

Obare, F., A. Agwanda, and M. Magadi. 2006. "Gender-role attitudes and reproductive health communication among female adolescents in South Nyanza, Kenya." *Etude de la Population Africaine* 21 (1):37-54.

Plummer, M.L., J. Wamoyi, K. Nyalali, G. Mshana, Z.S. Shigongo, D.A. Ross, and D. Wight. 2008. "Aborting and suspending pregnancy in rural Tanzania: an ethnography of young people's beliefs and practices." *Studies in family planning* 39 (4):281-292.

Shah, I. and E. Ahman. 2010. "Unsafe abortion in 2008: Global and regional levels and trends." *Reproductive health matters* 18 (36):90-101.

Singh, S. 1998. "Adolescent Childbearing in Developing Countries: A Global Review." *Studies in family planning* 29 (2):117-136.

Speizer, I.S. 2010. "Intimate partner violence attitudes and experience among women and men in Uganda." *Journal of interpersonal violence* 25 (7):1224-1241.

Uthman, O.A., S. Lawoko, and T. Moradi. 2009. "Factors associated with attitudes towards intimate partner violence against women: A comparative analysis of 17 sub-Saharan countries." *Bmc International Health and Human Rights* 9 (1).

Varga, C.A. 2003. "How gender roles influence sexual and reproductive health among South African adolescents." *Studies in family planning* 34 (3):160-172.