Women's Age at Marriage and HIV Status: Evidence from Nationally-Representative Data in Cameroon

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Abstract

Recent research has highlighted the risk of HIV infection for married teenage women compared with their unmarried counterparts (Bruce and Clark 2003, Clark 2004). This study assesses whether a relationship exists between age at first marriage and HIV status for women that have completed their adolescence (aged 20-29 years) utilizing the nationally-representative 2004 Cameroon Demographic and Health Survey. Multivariate analysis shows that late-marrying women have the highest risk of HIV. Age at first intercourse instead has no relationship with HIV status, except when only 20-24 year olds are analyzed, suggesting that a longer period of pre-marital sexual activity may explain a higher risk of infection for late-marrying women. Although women in urban areas overall marry later than their rural counterparts, the positive relationship between age at marriage and HIV risk is stronger in rural areas. The higher wealth status and greater number of lifetime sexual partners of late-marrying women contribute to their higher HIV risk.

Introduction

Young women in sub-Saharan African countries have consistently been found to have a higher risk of becoming HIV-positive compared with their male counterparts (Glynn et al. 2001, Gregson et al. 2002, Laga et al. 2001). In many of these countries, including Cameroon, early age at first marriage is common. This paper utilizes the 2004 Cameroon Demographic and Health Survey (CDHS) to analyze whether age at first marriage is associated with risk of infection for women that have completed their adolescence (20-29 years) (INS and ORC Macro 2006). Firstly, literature examining the relationship between age at marriage and HIV infection is reviewed, together with a description of the prevalence of HIV and the patterns of age at marriage among young women in Cameroon.

Recent research has highlighted married adolescent women's risk of HIV infection. Findings from cities in Cameroon, Kenya and Zambia show that married teenage women are more likely to be HIV-positive than unmarried women (Clark 2004, Glynn et al. 2001, Lydie et al. 2001). The vulnerability of married compared with never-married adolescent women in sub-Saharan Africa is related to them having earlier initiation and greater frequency of sexual intercourse and rare use of condoms due to a relative lack of bargaining power relative to their husbands, who are more likely to be older and HIV-positive than the partners of unmarried women (Bruce and Clark 2003, Clark 2004, Clark et al. 2006). In rural Malawi women have been shown to be at high risk of infection from their husbands, who are over ten-times more likely to be HIV-positive at the time of marriage (Bracher et al. 2003). Age difference with their husbands is a particular concern for teenage women. In rural Uganda the higher risk of HIV infection from having a husband over ten years older is greater for teenage women than for those aged 20-24 years (Kelly et al. 2003). Young women that marry early are demonstrated in a number of developing countries to have little access to information about HIV because of having lower educational status and access to media compared to non-married teenage women (Clark et al. 2006). It is argued that these findings emphasize that HIV policy should more fully recognize the risks of teenage married women to infection within marriage (Bruce and Clark 2003, Clark et al. 2006).

Cross-city analysis in sub-Saharan Africa reveals a negative correlation between median age at first marriage and HIV prevalence. In Yaoundé, Cameroon, women have a higher median age at marriage and longer duration between first sex and marriage than women in Kisumu, Kenya and Ndola, Zambia (Ferry et al. 2001). However, the HIV prevalence rate in Yaoundé is lower (Ferry et al. 2001). The lower prevalence rate in Yaoundé occurs despite higher-risk sexual behavior by both men, who report having a higher number of lifetime partners before marriage, contact with a commercial sex worker, and non-spousal partners than men in the other cities, and women, who report having a higher level of sex outside marriage (Auvert et al. 2001).

Bongaarts (2006) has closely examined the relationship of age at marriage and HIV status. Analysis of 33 sub-Saharan African countries was undertaken using country-level HIV prevalence data from UNAIDS, primarily sourced from testing of pregnant women in antenatal clinics, and age at marriage data from the DHS. The findings revealed that median age at first marriage is positively related to HIV prevalence. Individual-level analyses of Kenya and Ghana by Bongaarts (2006), using HIV data measured in the DHS and controlling for age, place of residence and education, show that the length of time between first intercourse and first marriage more strongly predicts HIV infection than the interval after first marriage. Corresponding with these findings, a review by Slaymaker (2004) suggests that the risk of HIV does not vary by age at first sex; the relationship was found not significant in each of seven different studies.

In Cameroon data from the 2004 CDHS shown in Table 1 reveals that, like other sub-Saharan countries, younger women have a far higher level of HIV prevalence than their male counterparts. The prevalence rate for women is over three-times that of men for ages 15-19 and 20-24, and is more than double for age group 25-29. Only in the 35-39 age group do men have a higher level of HIV than women. According to the median HIV prevalence rate of pregnant women at antenatal clinics, the HIV rate in major urban areas of Cameroon rose from 1.8% in 1992 to 7.0% in 2002 (UNAIDS and WHO 2006). In the

1980s and early 1990s Cameroon had a low HIV prevalence rate compared with neighboring countries (Mbopi Keou et al. 1998).

Table 1: HIV prevalence rate by sex and age group, Cameroon, CDHS 2004

Age group	Males	Females	Total
15-19	0.6	2.2	1.4
20-24	2.5	7.9	5.5
25-29	5.1	10.3	7.8
30-34	8.3	9.4	8.9
35-39	8.6	7.8	8.2
40-44	5.6	6.0	5.8
45-49	3.8	5.5	4.7
Total	4.1	6.8	5.5

Note: Weighted cases.
Source: INS and ORC Macro (2004)

The analysis of early age at marriage and HIV risk is especially important in Cameroon, where nationwide women marry at a young age compared with many other sub-Saharan African countries. Figure 1 the median age at first marriage in Cameroon is 18.3 years. Women in Cameroon marry earlier than in many other countries, including Southern African countries like Zambia, Zimbabwe and South Africa where HIV is more highly prevalent. However a trend towards an older age at marriage is evident in Cameroon. Figure 2 shows that the median age at marriage rose from 17.3 years in 1991 to 18.3 years in 2004. There was a smaller increase in the median age at first intercourse over the same period from 16.2 years to 16.7 years, resulting in an increase in the length of time from first intercourse to first marriage from 1.1 years to 1.6 years.

In Cameroon a woman's age at first marriage varies substantially by socio-economic status. Table 2 shows that women residing in rural areas, in the Northern region, from poorer households, lesser educated and of Muslim faith are more likely to marry early than other women. In the Northern region 72.2% of currently married women aged 20-29 years first married at age 16 years and under, compared with 23.7% of women in the Central region, which comprises the large urban centers of Yaounde and Douala. Interpretation of these regional differences need to consider that the Northern region is predominantly poor, lower educated and Muslim, compared with the wealthier and

Figure 1: Median age at first marriage of women aged 20-24 years, various sub-Saharan African countries, various DHS

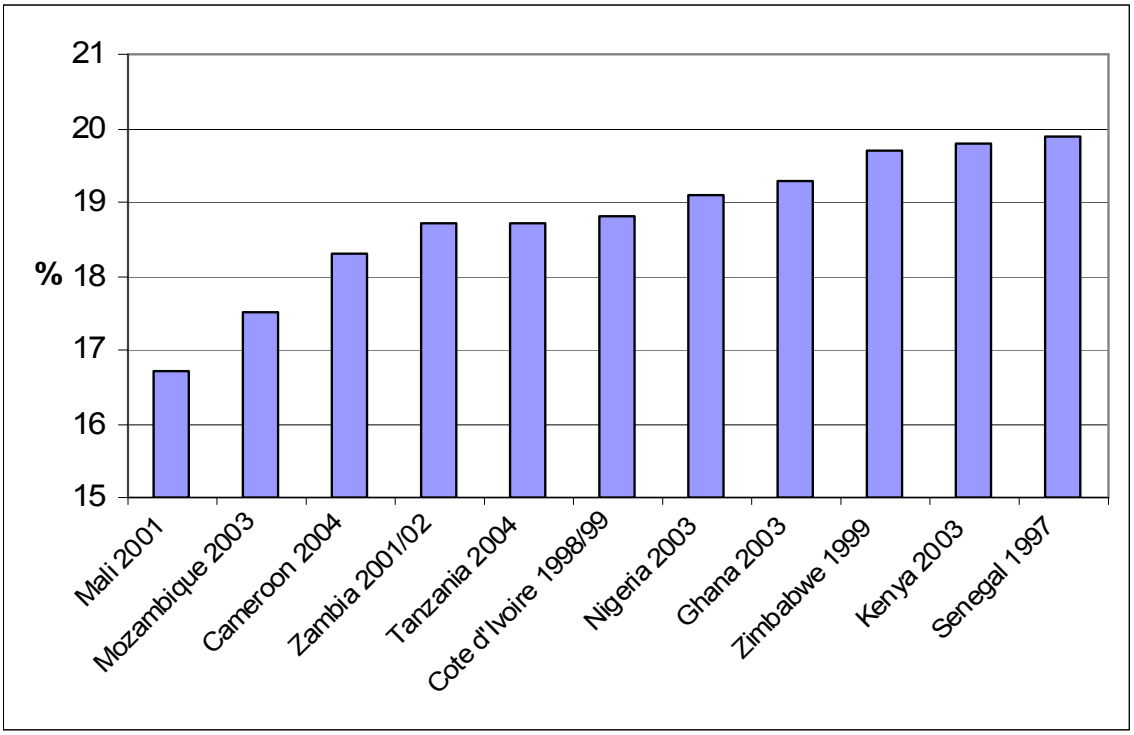
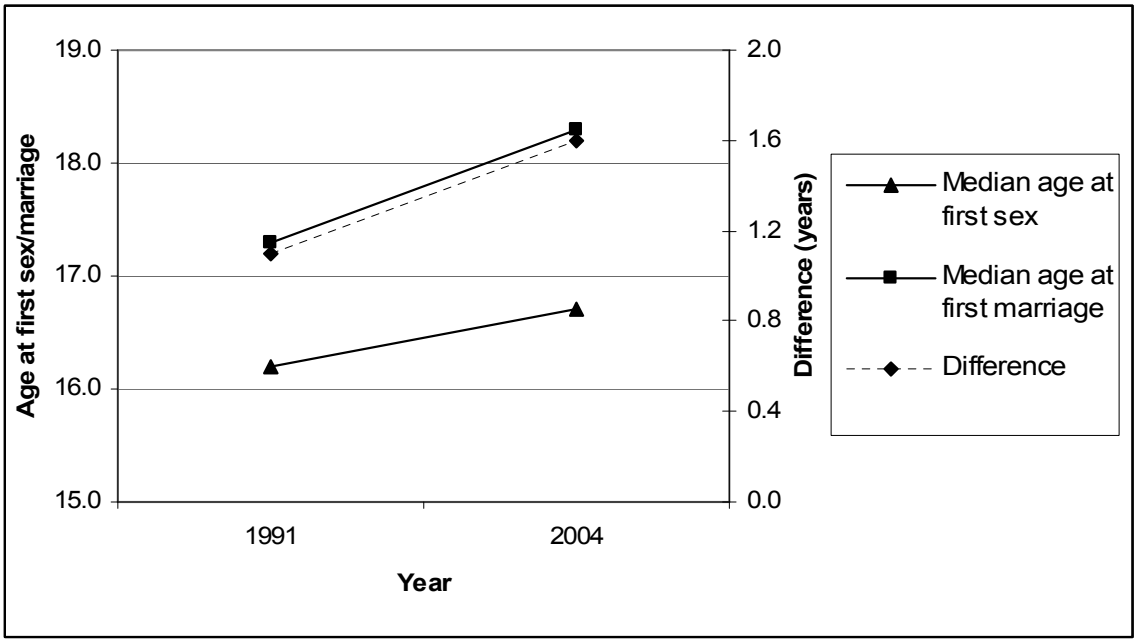


Figure 2: Median age at first sex, median age at first marriage, and difference (years), women aged 20-24 years, various sub-Saharan African countries, various DHS



predominantly Christian Central region. 66.9% of women from the poorest household wealth quintile marry at age 16 or under, compared with only 21.9% from the richest quintile. A similar difference exists between women whose education level is none or incomplete primary (68.8%) and those with incomplete secondary education or higher (26.7%), as well as for Catholics (35.8%) and Muslims (75.1%). In contrast with the characteristics of early-marrying women, HIV in sub-Saharan Africa is more prevalent amongst the wealthier, urban population (Garcia-Calleja et al. 2006, Mishra et al. 2006).

Table 2: Place of residence, household wealth quintile and education by woman's age at first marriage, currently married women age 20-29 years, Cameroon, CDHS 2004

	16 years & under	17-19 years	20 years & above	Total	N
Place of residence					
Urban	38.3	32.0	29.8	100.0	739
Rural	57.8	27.1	15.1	100.0	742
Region of residence					
Central	23.7	36.6	39.7	100.0	412
Southern/Eastern	45.2	30.4	24.4	100.0	135
Western	43.1	31.9	25.0	100.0	415
Northern	72.2	21.7	6.1	100.0	519
Wealth Index					
Poorest	66.9	26.1	7.1	100.0	316
Poorer	61.3	24.6	14.1	100.0	290
Middle	51.6	30.1	18.3	100.0	275
Richer	38.9	34.9	26.2	100.0	295
Richest	21.9	32.0	46.2	100.0	305
Education					
None or primary incomplete	68.8	22.8	8.5	100.0	702
Primary complete	34.6	38.3	27.1	100.0	270
Secondary incomplete or higher	26.7	34.1	39.2	100.0	509
Religion					
Roman Catholic	35.8	35.1	29.1	100.0	540
Protestant	41.1	31.1	27.8	100.0	465
Muslim	75.1	18.0	6.9	100.0	309
Other	58.1	27.9	14.0	100.0	164
Total	48.1	29.5	22.4	100.0	1,481

Note: Weighted cases. Only women tested for HIV included.
Regions of residence: Central – Centre, Douala, Littoral, Yaounde; Southern/Eastern – South, East; Western – Northwest, West; Northern – Adamaoua, Extreme North, North.
Source: INS and ORC Macro (2004)

Age at first marriage also varies by sexual behavior, as shown in Table 3. Mean age at first intercourse increases quite strongly with age at marriage; average age at first intercourse is 14.6 years for women marrying at 16 years, compared with age 16.8 years for those marrying at 17-19 years and age 17.3 years for those marrying at 20 years and above. Despite first experiencing sexual intercourse at a young age, women that marry earlier have a substantially lower reported number of lifetime sexual partners than those marrying later. Slightly more than half of women that married at age 16 years and under report only one lifetime partner, while 69.1% of those married at 20 years and above report three or more partners. Women marrying in their twenties thus have, on average, longer pre-marital sexual lives and a greater number of partners than women marrying earlier.

Table 3: Age at marriage by mean age at first intercourse and median number of lifetime number of partners, currently married women age 20-29, Cameroon, CDHS 2004

Age at marriage	Mean age at first intercourse	Number of lifetime partners			
		1	2	3+	Total
16 years and under	14.6	52.7	20.3	27.0	100.0
17-19 years	16.8	33.3	20.6	46.1	100.0
20 years and above	17.3	16.2	14.7	69.1	100.0
Total	15.8	38.8	19.1	42.0	100.0

Source: INS and ORC Macro (2004)

Data and Methodology

The 2004 CDHS is a nationally-representative two-stage sample survey, and the first CDHS to conduct HIV testing. The HIV testing was undertaken of respondents who voluntarily provided blood samples after being informed of procedures, confidentiality and VCT services. The dried blood spot samples were then tested in a laboratory. 5.4% of the 5,703 women aged 15-49 years eligible for testing refused to be tested (8.5% in urban, 2.3% in rural). The CDHS has the advantage of having detailed socio-demographic information, including the characteristics of married couples, which are anonymously linked to the HIV data. This information enables the relationship between marital status and marriage characteristics to be examined quantitatively. The use of nationally-representative data is important because of the large variation in the age at

marriage by population characteristics, especially place of residence. Many of the studies described above were only conducted in large cities.

Logistic regression analysis using STATA, applying sample weights and adjusting standard errors for sample clustering is conducted to predict a woman's HIV status by the age at marriage (StataCorp 2003). To account for women that marry in their twenties, currently married women aged 20-29 years are analyzed. Only those women that received a conclusive test result (ie, either HIV-positive or HIV-negative) are included. Age at marriage is categorized as 16 years and under, 17-19 years and 20 years and over. The first models control for age at first intercourse and current age. The analysis is initially conducted for all cases and then restricted to solely urban and rural areas to determine whether the relationship of age at marriage and HIV varies by place of residence. To determine if any factors explain the relationship of age at first marriage and HIV, the next two models include the socio-economic factors analyzed in Table 2: urban/rural place of residence, education level, region of residence, household wealth and religion. The final model adds the behavioral factors of number of lifetime sexual partners and use of a condom at last intercourse in the previous 12 months.

Results

Firstly, HIV prevalence by marital status within each age group and the HIV status within couples is presented. Table 4 presents HIV status for women by marital status and age group. Married women aged 15-19 years have a higher HIV prevalence than never married women, however this difference is not significant. At ages 20-24 and 25-29, however, a higher proportion of never married women are HIV-positive compared with currently married women. Again this difference is not significant. Formerly married women have a much higher level of HIV, possibly because many had husbands that died from AIDS.

Table 5 shows that currently married women are more likely to be HIV-infected than their husbands. More couples have the wife as the HIV-positive partner in a HIV-

Table 4: HIV status by marital status and age group, women age 15-29 years who have ever had sexual intercourse, Cameroon, CDHS 2004

Age group	Marital status	HIV-positive (%)	N	Chi-square p-value*
15-19	Never married	2.0	295	
	Currently married	3.8	400	0.486
	Formerly married	5.6	35	
	Total	3.2	730	
20-24	Never married	9.4	176	
	Currently married	7.1	762	0.526
	Formerly married	14.2	75	
	Total	8.0	1,014	
25-29	Never married	10.3	58	
	Currently married	9.6	711	0.251
	Formerly married	19.0	51	
	Total	10.5	839	

Note: Weighted cases.
* Chi-square test conducted of never married versus currently married.
Source: INS and ORC Macro (2004)

discordant couple compared with the husband (2.7%). This suggests that many women are not getting infected from their husbands within marriage. HIV-positive concordancy remains low, so there is much potential for HIV to spread within married couples. This finding is despite the evidence of high risk behavior by men, and is in contrast to the far higher HIV prevalence of the groom at marriage in rural Malawi found by Bracher et al. (2006).

Table 5: Couple's HIV status, women age 15-29 years, Cameroon, CDHS 2004

Couple's HIV status	%	N
Positive concordant	2.9	31
Man positive, woman negative	2.7	29
Woman positive, man negative	3.5	38
Negative concordant	90.9	990
Total	100.0	1,089

Note: Weighted cases.
Source: INS and ORC Macro (2004)

Table 6 shows the univariate and bivariate statistics for the variables included in the multivariate analysis of HIV status for currently married women aged 20-29 years. Age at first marriage has a strong positive relationship with HIV status; the prevalence for a woman married at age 16 years or younger (5.7%), which includes approximately half of

the women in the analysis, is less than half that of those married at age 20 years or higher (13.4%). Women living in rural areas are also far less likely to be HIV-positive than those in urban areas. Age at first marriage is not significantly related with HIV status within urban areas. However, in rural areas there is a substantial difference between those married in their teens (16 years and under: 4.0%, 17-19 years: 4.4%) and at 20 years and older (13.1%). The mean age at first intercourse does not differ significantly by whether a woman is infected. Education level and especially household wealth quintile are associated with HIV status. There is a noticeably low level of HIV prevalence for the least educated (5.0%) and poorest women (3.2%). There is also a significantly lower HIV prevalence for women in the Northern region (4.6%) compared with other regions, and for Muslims (6.4%) and women of other religions (4.1%) compared with women of other religions. Women that are HIV-positive have had a significantly higher average number of lifetime partners than HIV-negative women. Use of a condom at last sex is not significantly associated with HIV status.

The multivariate analysis of age at first marriage in Table 7 shows that, controlling for age at first intercourse and current age, those women marrying at age 20 and above in Cameroon are over two-and-a-half-times more likely to be HIV-positive than those marrying at age 16 years and under. This corresponds to the finding of Bongaarts (2006) from city level analysis of sub-Saharan Africa. There is no significant difference with those that married at age 17-19 years. Age at first intercourse is not significantly associated with woman's HIV status, as found in the review by Slaymaker (2004). For the analysis within urban areas, both age at first marriage and age at first intercourse have no significant relationship with HIV status. In contrast, in rural areas there is a very strong and significant association; women marrying at age 20 years and over are more than three-times as likely to be HIV-positive as those marrying at 16 years and under. There is some difference in the effect of age at marriage by age cohort. For women aged 20-24 years, marrying at age 20 years and above more strongly predicts HIV status than for women aged 25-29 years (20-24 odds=3.49, 25-29 odds=2.25). Furthermore, for women aged 20-24 years, the risk of HIV is 20% lower for each year that age at first sex is later. There is no such relationship for women aged 25-29 years.

Table 6: Univariate and bivariate statistics, currently married women age 20-29 years, Cameroon, CDHS 2004

	N	%	HIV-positive (%)
Outcome variable			
HIV status			
HIV-positive	122	8.2	-
HIV-negative	1,359	91.8	
Explanatory variables			
Age at first marriage			
16 years and under	712	48.1	5.7
17-19 years	437	29.5	8.4
20 years and over	332	22.4	13.4**
Age at first marriage - urban			
16 years and under	283	38.3	8.4
17-19 years	236	32.0	11.8
20 years and over	220	29.8	13.6
Age at first marriage - rural			
16 years and under	429	57.9	4.0
17-19 years	201	27.0	4.4
20 years and over	112	15.1	13.1**
Age at first marriage - 20-24 years			
16 years and under	483	48.3	5.5
17-19 years	312	31.2	7.3
20 years and over	205	20.5	11.3**
Age at first marriage - 25-29 years			
16 years and under	420	44.8	6.0
17-19 years	246	26.3	9.9
20 years and over	271	28.9	14.7
Age at first sex (mean)	15.8		HIV-pos.=16.0
Missing (n)	*8*		HIV-neg.=15.8
Current age (mean)	24.3		25.0**
Place of residence			
Urban	739	49.9	11.0
Rural	742	50.1	5.5**

	N	%	HIV-positive (%)
Explanatory variables (contd.)			
Education level			
None or primary	702	47.7	5.0
Primary complete	270	18.2	9.8
Secondary	509	34.4	11.8**
Region of residence			
Central	412	27.8	10.4
Southern/Eastern	135	9.1	10.5
Western	415	28.0	9.9
Northern	159	35.0	4.6**
Household wealth			
Poorest	316	21.3	3.2
Poorer	290	19.6	3.5
Middle	275	18.6	10.0
Richer	295	19.9	12.4
Richest	305	20.6	12.4**
Religion			
Roman Catholic	540	36.5	10.6
Protestant	465	31.5	8.5
Muslim	309	20.9	6.4
Other	164	11.1	4.1*
Missing (n)	*3*		
Lifetime partn. (mean)	3.0		HIV-pos.=4.8**
Missing (n)	*2*		HIV-neg.=2.8
Used condom at last intercourse			
No	1,191	89.7	8.2
Yes	137	10.3	9.3
Missing	*153*		
Total cases	1,481	100.0	

Note: p-value is obtained from a chi-square test or, for age and number of lifetime partners, a t-test. Weighted cases.
* p<0.05 **p<0.01
Source: INS and ORC Macro (2004)

Table 8 shows that age at first marriage loses much of its predictive power after including the additional variables. In Model 1, living in a rural area reduces the probability of being

Table 7: Multivariate analysis of HIV status, currently married women age 20-29 years, Cameroon, 2004 CDHS

			Place of residence				Age			
	All		Urban		Rural		20-24 years		25-29 years	
Variables	Odds	Z	Odds	Z	Odds	Z	Odds	Z	Odds	Z
Age at first marriage										
16 years and under	Ref		Ref		Ref		Ref		Ref	
17-19 years	1.72	1.86	1.69	1.36	1.23	0.28	2.17	1.85	1.52	1.03
20 years and over	2.69**	3.29	1.96	1.58	3.43**	3.29	3.49**	2.93	2.25*	2.04
Age at first intercourse	0.95	1.09	0.93	-1.05	0.96	1.93	0.80**	-2.68	1.05	0.88
Current age	1.08*	2.17	1.06	1.29	1.10	1.96	1.18	1.51	1.18	1.75
Number of cases	1,476		630		846		762		714	

* p<0.05 **p<0.01
Source: INS and ORC Macro (2004)

infected (odds=0.61). Education level however is not significantly related with HIV status, despite the large bivariate difference. In Model 2, household wealth quintile is a very strong predictor of HIV status and also reduces the strength of age at first marriage. A woman living in a household in the middle, richer and richest quintile is far more likely (Middle odds=2.85, Richer odds=3.64, Richest odds=3.55) than a woman in the poorest wealth quintile of being HIV-positive. Region of residence and religion have no association with HIV status after controlling for other factors. In Model 3, the number of lifetime partners is significantly related with HIV status. For each additional partner a woman has ever had sexual intercourse with, she has a 6% greater likelihood of being HIV-positive. After the inclusion of these factors, household wealth remains a strong predictor of HIV status. However age at first marriage is no longer significant.

Discussion and Conclusion

Marriage at age 20 years above predicts a higher likelihood of being HIV-positive for currently married women aged 20-29 years in Cameroon compared with those marrying at age 16 years and under and controlling for age at first intercourse and current age. Marriage at age 17-19 years however does not increase HIV risk. Bongaarts (2006) also found a positive relationship between age at marriage and HIV risk from country level analysis in 33 sub-Saharan countries. It is important to distinguish these findings with

Table 8: Multivariate analysis of HIV status, currently married women age 20-29 years, Cameroon, 2004 CDHS

	Model 1		Model 2		Model 3	
Variables	**Odds**	**Z**	**Odds**	**Z**	**Odds**	**Z**
Age at first marriage						
16 years and under	Ref		Ref		Ref	
17-19 years	1.39	1.16	1.44	1.21	1.41	1.13
20 years and over	1.95*	2.22	1.99*	2.23	1.76	1.70
Age at first intercourse	0.93	-1.29	0.92	-1.52	0.95	-0.82
Current age	1.08*	2.10	1.08*	2.20	1.09*	2.04
Place of residence						
Urban	Ref		-		Ref	
Rural	0.61*	-2.11			0.94	-0.21
Education level						
None or primary incompl.	Ref		-		-	
Primary complete	1.61	1.56				
Secondary incompl./higher	1.69	1.79				
Region of residence						
Central	-		Ref		-	
Southern/Eastern			1.39	1.09		
Western			1.53	1.48		
Northern			1.24	0.56		
Household wealth quintile						
Poorest	-		Ref		Ref	
Poorer			1.03	0.05	0.89	-0.23
Middle			2.85**	2.61	2.69**	2.61
Richer			3.64**	3.25	3.38**	2.92
Richest			3.55**	3.14	2.92*	2.40
Religion						
Roman Catholic	-		Ref		-	
Protestant			0.68	-1.56		
Muslim			0.76	-0.77		
Other			0.41	-1.82		
Number of lifetime partners	-		-		1.06**	2.73
Used condom at last intercourse						
No	-		-		Ref	
Yes					0.78	-0.70
Number of cases	1,476		1,474		1,317	

* p<0.05 **p<0.01
Source: INS and ORC Macro (2004)

those of Bruce and Clark (2003) and Clark (2004) that teenage women marrying earlier have a higher risk of HIV. The findings presented in Table 4 show that married teenage

women have a higher but non-significant HIV prevalence than never-married women. However analysis of women aged 20-29 years, who have completed their adolescence, provides a more complete perspective of the risk of HIV for women marrying later.

Age at first sex however has no significant association with HIV status for the analysis of all women aged 20-29 years. Given the higher HIV risk for those marrying later, the finding suggests that the length of the period between first sex and first marriage is crucial in predicting whether a woman is infected. Bongaarts (2006) also found that the longer this period, the greater a woman's likelihood of being HIV-positive. This relationship can be explained by the higher number of lifetime partners of women that marry in their twenties compared with those marrying earlier. The higher proportion of married couples that have a HIV-positive woman than a HIV-positive man suggests that many women are getting infected from someone other than their husband, possibly before marriage[1]. Those women that have married early instead have a much lower lifetime number of partners and smaller HIV risk.

The difference in the relationship of age at first marriage with HIV status between urban and rural areas is particularly revealing. Although late marriage is more common in urban areas, it is associated with a relatively high HIV risk in rural areas. Table 6 shows that the HIV prevalence of women in rural areas marrying at age 20 years and above is similar to women in urban areas marrying at the same age. Rural women marrying in their teens however have a far lower HIV risk than their urban counterparts. The lower overall risk of HIV in rural areas appears to protect early-marrying women more than in urban areas. The difference in findings between urban and rural areas is an important demonstration of the benefits of utilizing nationally-representative data.

The relationship of age at first marriage and HIV risk is somewhat higher for 20-24 year old women than 25-29 year old women, however this difference is not large enough to make clear conclusions. However, there is an obvious difference in the result for age at

[1] It may also reflect that, in the absence of other risk factors, men are more likely to transmit HIV to a woman rather than vice versa (European Study Group on Heterosexual Transmission 1992).

first sex by age cohort. For women aged 20-24 years, those who make their sexual debut later have a lower HIV risk, while for 25-29 year olds and all women aged 25-29 years there is no relationship. This finding suggests there is some cohort change in the association of age at first sex and HIV risk. It may be explained by HIV prevalence growing quickly in the late 1990s, and hence infection levels being high, when many of the 20-24 year olds in 2004 would have begun their sexual lives. In contrast, HIV prevalence in Cameroon, and most likely the level of infection as well, remained low in the early 1990s when many 25-29 year olds would have had intercourse for the first time. However, if infection levels had risen there would possibly be a positive relationship for age at first sex and HIV risk for 25-29 year olds. Such conclusions are far from firm. Furthermore, given cohort differences in these findings, it is difficult to postulate as to the effect delays in sexual debut have on HIV risk for women aged in their twenties.

The introduction of socio-economic variables into the multivariate analysis reduces the predictive power of age at marriage. This indicates that the association of age at marriage and HIV risk is somewhat a function of socio-economic status, as demonstrated in Table 2. Household wealth quintile is the strongest predictor of HIV status, and other research has found that HIV prevalence is highest amongst the wealthier population (Mishra et al. 2006). Household wealth also reduces the predictive strength of other variables that have a bivariate relationship and are associated with socio-economic status, such as urban/rural residence, region of residence, and religion. Education level has no relationship with HIV status even without the inclusion of household wealth. Socio-economic status does not explain all of the relationship of age at marriage and HIV status, however the introduction of lifetime number of partners does result in age at marriage no longer being significant. This finding demonstrates that the higher HIV risk of later-marrying women partly due to their greater number of partners. In addition to explaining the effect of age at marriage, it emphasizes the risks women face if by having sexual relations with a high number of men.

Policy should recognize that the high risk of infection for late-marrying women is largely due to their longer period between first intercourse and marriage. This period in women's

late teens, when they have a higher number of partners than early-marrying women, is critical in preventing them from becoming infected. The long-term increase in the age at marriage and the length of time between first sex and marriage suggests that in future more young women will likely remain unmarried during their late teens and have extended pre-marital sexual lives.

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