

UNION FORMATION AND THE TIMING OF A FIRST BIRTH IN CENTRAL UGANDA: A DECREMENT LIFETABLE ANALYSIS

Charles B Lwanga

Population Research and Training Unit, North-West University (Mafikeng Campus), South Africa

Population Studies, School of Statistics and Planning, Makerere University, Uganda

Email: cblwanga@gmail.com/clwanga@bams.mak.ac.ug

Corresponding Author

Ishmael Kalule-Sabiti

Population Research and Training Unit, North-West University (Mafikeng Campus), South Africa

Email: ishmaelsabiti@gmail.com

ABSTRACT

The aim of the paper was to use life history survey data to answer the question of whether the timing of a first child differs between women who married after cohabitation, women who married directly and those who were still cohabiting as a form of first union. This paper was based on a study of a micro-survey data collected on the three first union in central Uganda using retrospective methods and analyzed using decrement life-tables. The results showed that whether married directly, following cohabitation, or still cohabitating, the risk of giving birth to a first child within one year was nearly the same. However, marrying directly accelerated the pace of giving birth to a first child. Age at first union significantly influenced the timing of a first birth, especially during the first year of first union with women aged 20 and over exhibiting shorter intervals.

Keywords:

Marriage, cohabitation, first union, first birth, nuptiality, lifetable, Uganda

Introduction

The coming of a first child has always been an important event in defining a first union (Anuwoje Logubayom & Luguterah, 2013; Davis, 2008). This paper focuses on the timing of the first birth for women who married after cohabitation, women who married directly and those who were still cohabiting as a form of first union in central Uganda. Although the ideal environment for bearing and raising a child is within marriage, the notion of cohabiting as a stage suggests that marriage process that has cohabiting as one of the stages a woman has to pass before getting married (Gibson-Davis & Rackin, 2014; Mokomane, 2005; Muriithi, Ngige, & Mugenda, 2011; Posel & Rudwick, 2013). In Uganda, like elsewhere in sub-Saharan Africa, marriage or union formation has been defined as being early and universal (van de Walle, 1968). For instance, the proportion of women aged 15 to 49 who were in union was 67% in 2001 and 63% in 2011. Notable, however, is the increased proportion of women in cohabiting relationships from 14% in 2001 to 27% by 2011 (UBOS & ICF International Inc, 2012).

Previous studies have indicated that, controlling for other factors, the pattern for directly married women is to have a first child soon after marriage than it is in a cohabiting relationship and the risk decreases with time (Kostova, 2005). Using data from the 2008 Ghana Demographic Surveys, Anuwoje Logubayom & Luguterah (2013) found similar results. These authors also found place of residence, education, pregnancy termination, and wealth index to be significantly associated with the timing of first birth at bivariate level. However, region of residence and pregnancy termination were the only significant net effects.

In Uganda, existing research involves examining the sociodemographic determinants of the age at a first birth (DeRose & Kravdal, 2007; Garenne, 2004), and not the effect that cohabitation or marriage as a form of first union has on the timing of first birth. Yet, the timing of a first birth, following the first union, is one of the important factors which affect fertility (UBOS & ICF International Inc, 2012). Evidence from previous studies suggests that in populations where the use of contraceptives is low (in Uganda standing at 26%), and where there are shorter inter-birth intervals, the timing of the first birth influences fertility (Khan, Bradley, Fishel, & Mishra, 2008). The time to a first birth is also reported to be closely associated with completed family size, marriage practices and other social factors (Gurmu & Etana, 2014; UBOS & ICF International Inc, 2012). The study by Otiso (2006) had a focus on a gender roles, marriage and

family. It provided evidence of rising cohabitation but could not relate it to the timing of family formation.

Despite the patchy information on cohabitation and marriage, a study linking cohabitation and marriage to the timing of a first birth using the decrement lifetable approach is lacking. Analysis of life history data and the lifetable approach would help to show a transition to motherhood between women who married after cohabitation and those who married directly in a developing country setting. Drawing on the above, this paper addresses two arguments: First, does the timing of a first child differ between women who married after cohabitation, women who married directly and those who were still cohabiting as a form of first union? Second, what other factors influence the timing of a first birth? The paper also discusses the implications of the results for understanding the transition to motherhood.

Data and Methods

Life history data collected in 2013 using retrospective methods from a cross-sectional study of women aged 15 to 49 in the central region of Uganda were analysed. The study used a multistage random sampling method. The first stage randomly sampled Luwero and Wakiso districts from a list of 24 districts; in the second stage 20 enumeration areas (EAs) were selected from each district and in the third stage, 30 households were selected from each EA. In all the households, only one woman aged 15 to 49 was selected to participate in the interview. The study was restricted to women in the reproductive age group because the type of union has implications for fertility. The grid-like questionnaire was designed to collect information on nuptiality, fertility and socioeconomic background of women, their parents and partners. Just like it is with other African countries, union or marriage as conceptualised in Uganda is a process rather than a single legal act (Otiso, 2006). This paper defines a union or marriage as all types of unions between a man and a woman which include regularised (customary, legal marriage and civil marriage) and non-regularised as cohabitation. Non-regularised unions were included because they might be used to explain noticeable differences in the timing of the first birth over duration of time in union.

Measures

The dependent variable is the time to a first birth following a first union. It was computed in years from two questions. When did you enter the first union? And when did you give birth to your first child? Based on each woman's response, the time to the first birth was computed by subtracting the year of first entry into union from the year of birth of a first child. Using years was intended to minimize errors because the majority of the women could easily remember the year of birth of their children and the year of entry into union. A woman respondent was right censored if, by the time of the survey, she had not given birth to her first child or had separated. To account for the effect of a pregnancy before union, several cleaning procedures were carried out. Firstly, women who had a first birth before entering first union were excluded from the analysis (left censored cases) and these constituted nearly 36% of the women in first union. Secondly, the dependent variable was considered to be the time taken by the individual woman to have a first birth minus 8 months (0.67 of a year). By subtracting 8 months (0.67 of a year), conception was perceived to be resulting from a union (direct marriage or marriage after cohabitation or still cohabiting) (Baizán, Aassve, & Billari, 2003). Although a pregnancy takes 9 months, a woman is unlikely to know her pregnancy status in the first month of gestation until she misses her menstrual period. This is the reason why 8 months instead of 9 months were subtracted. Thirdly, of the 865 women respondents who were in union, only 555 (64%) were considered for analysis because they met the criteria described above.

The independent variables include type of first union, education, religious affiliation, employment status, age at first union, birth cohort and, mother's education. The independent variables were selected basing on past studies (Baizán et al., 2003; Baizán, Aassve, & Billari, 2004; Feng & Quanhe, 1996; Manning, 1995). The type of first union was recorded with three levels as married directly, married preceded by cohabitation (married the same partner) or still cohabiting; education was recorded as up-to primary and secondary or higher; religious affiliation was categorised as Catholics, Anglican (Protestants & Pentecostal) and Muslim; employment was coded as working and not working, and mothers education categorized as primary, secondary and tertiary. The demographic variables included age at first union, which was coded as less than 20 and 20 years and above, and birth cohort, categorised as 1970 to 1979, 1980 to 1989, and 1990 to 2000.

Statistical Analysis

Lifetable estimates which is a form of survival analysis were used to show the transition to motherhood for women who married after cohabitation, women who married directly and those who were still cohabiting as a form of first union. The lifetable approach was used to estimate the proportion of women in unions without a first birth at the end of each year. Specifically, the life-table approach was used to estimate the cumulative proportion of women in first union who became mothers at the end of each year of observation as a complement of those who had not had a first birth (Preston, Heuveline, & Guillot, 2001). The lifetable approach uses the number of women in first union exposed to the risk of giving birth to a first child to estimate the probability of women without a first child. The computed probability of women without a first birth is then used to estimate the cumulative proportion of women lacking a first birth at the end of each year of observation. The probability of women in first union without a first birth is given as in equation "1".

$$p_x = l_{n+x}/l_x \quad (1)$$

Where, l_x - is the number of women exposed to the risk of giving birth to a first birth at the end of each interval of time, p_x is the probability of women in union without a first birth and, n is the interval (one year).

The cumulative proportion (p^{cp}) of women without a first birth at the end of each year of observation takes the form described in equation "2".

$$p^{cp} = p_x * p_{x+n} \quad (2)$$

The implied proportion of women in union (q^{cp}) who had given birth to a first child by the end of the interval (each year) is given as in equation "3".

$$q^{cp} = 1 - p^{cp} = 1 - p_x * p_{x+n} \quad (3)$$

Differences between women who married after cohabiting as a form of first union and women who married directly as a form of first union as well as those who were still cohabiting, with regard to the timing of a first birth, are expected to be revealed by the cumulative proportions of women without a first birth at the end of each year since union. Also, similar differences are expected for other background characteristics known to influence the time to a first birth. Significant differences between survival functions of different groups were tested using a generalised Wilcoxon test, which is a nonparametric statistical test. This test was deemed appropriate because some variables were not normally distributed.

The Cox's proportional hazard (PH) model was used to identify the risk factors of giving birth to the first child, usually estimates as the ratio of women who gave birth to a first child at the end of the year to the number of women exposed to the risk of giving birth. The PH assumption was evaluated using the scaled Schoenfeld residuals approach, while the overall predictive power of the model was diagnosed using Harrell's concordance and link-test (Cleves, Gould, Gutierrez, & Marchenko, 2010). The results are presented as risk ratios indicating the relative likelihood of the woman in a given group of a covariate giving birth to the first child relative to a woman in a reference category.

Results

Table 1 describes women respondents in union by background characteristics. The table shows that the majority of women in the study sample were still cohabiting (64.2%), followed by those who had married directly (about 27%), and women who married after cohabitation accounted for only 9%. The distribution by education shows that nearly 54% of the women had secondary education or higher. About 38%, 37%, 18% and 7% of the women in union were affiliated to the Anglican, Catholic, Muslim and other minority religious groups respectively. The majority of women in unions (nearly 77%) were doing some work and about 66% were aged less than 20 years. The distribution by birth cohort shows that slightly over half of the women were born in the 1980 to 1989 cohort, about 31% of whom were born between 1970 to 1979 and 18.4% fall in the 1990 to 2000 birth cohorts. With regard to mothers' education, nearly 41% had no education, 38% attained primary, 15.3% secondary and only 6% had tertiary education.

[Table 1]

The results of the lifetable estimates are presented in Table 2. The table shows the proportion of women who did not have a first birth six years since a first union. These results show that irrespective of the type of union, the risk of getting a first child within one year was nearly the same for women who married after cohabitation, as it was for women who married directly and those who were still cohabiting. Overall, over 80% of the women in the study population had a first birth by the end of the second year following a first union (see Table 2 & Figure 1). The lifetable also shows that by the end of the first year, 56% of the women who married after cohabitation, 59% of women who married directly and 60% of those who were still cohabiting had a first child. The results in Table 2 also indicate that marrying directly accelerated the pace of getting a first child compared to marrying after cohabitation. While about 92% of the women who married directly had had a first birth by the end of the third year since first union, all had given birth to a first child by the end of the sixth year. The table further shows that by the end of the third year 87% of the women who married after cohabitation and 90% of those who were still cohabiting had a first child. The corresponding figures by the end of the sixth year are 2% and 3% respectively.

[Table 2 and Figure 1]

Regarding the effect of education, Table 2 reveals that more women with secondary education or higher had a first birth by the end of the first year compared to those with less than secondary education. The corresponding figures are 62% and 58% respectively. By the sixth year, 97% of the women with primary education had given birth to a first child while it was 98% for women who had attained secondary education or higher. The effect of religious affiliation as a proxy for religiosity shows that by the end of the first year after a union, a low proportion of Anglican and Muslim women had given birth to a first child compared to Catholic women. The proportions are 59%, 56% and 64% respectively. By the end of the third year, 95% of the Catholics compared to 88% of the Anglicans and 85% of the Muslims had gotten a first child. The relationship between age at first union and timing of a first birth demonstrated that, in general, entering a first union at age 20 or older significantly accelerated the pace of getting a first child (Wilcoxon-Gehan=12.827, $p=0.000$). The results in table 2 show that 70% of women aged 20 or older had a first child within the first year, as compared to 55% for those who were aged less than 20. With respect to birth cohort analysis, the results in the table show that 66%

of the women born in the 1999-2000 cohort had, by the end of the first year, become mothers. Corresponding figures for the 1980-1989 and 1970-1979 birth cohorts are 58% and 61%. Overall, the transition to motherhood after first union was more accelerated for the recent birth cohort of women (1990-2000) than it was for earlier cohorts. The proportion of women who gave birth to a first birth after the first year in union was lower for women whose mothers had tertiary education compared to those whose mothers had attained secondary or primary education; and the proportions are 66% and 61%.

Results of the Cox regression are presented in Table 3. The model shows that the compared women who entered first union when they were aged less than 20, being aged 20 or higher significantly increased risk of having a first birth by 26%. The impact of woman's union type on the time to first birth indicates that women who married directly were observed to be 15% more likely to have a first birth earlier compared to those who married after cohabitation or still cohabiting (Table 3). However, the effect is not significant. Other factors were found not to be significant determinants of the waiting time to first birth for women in first union. Results show that neither the global nor the detailed test was significant suggesting that the proportionality condition was observed. Results of the specification error show that the Cox model was well specified, as predicted by the *hat* and *hatsq* statistic ($_hat$: $p=0.034$; $_hatsq$: $p=0.593$). Harrell's Concordance measures show that the Cox model correctly identifies the order of survival times for pairs of women by about 61% of the time (Harrell's $C=0.614$).

Discussion

This study aimed at answering two questions: Does the timing of a first child differ between women who marry after cohabitation, women who marry directly and those who were still cohabiting as a form of first union? What other factors influence the timing of a first birth following a first union? The study found that once a non-pregnant woman enters first union, irrespective of the route of entering marriage, the timing of a first birth is similar. Women who marry after cohabitation and those who were still cohabiting had almost the same pace in transiting to motherhood. However, after the first year following first union, marrying directly had an accelerated pace of giving birth to a first child compared to women who married after cohabitation or those who were still cohabiting. These results mirror what was found in the United States by Manning (1995) using the National Survey of Families and Households data.

Manning (ibid) compared women who married directly and those who married after cohabitation. She found that their experience with regard to the timing of a first birth was similar. The effect of having an accelerated pace of the timing of a first union among women who married directly may be explained in three ways. The first perspective is that marriage presents the best environment for childbearing and rearing as it has some level of commitment. The second view is that it could be due to the normative expectation from relatives and friends, in which, a woman who marries directly is expected to prove that she is fertile by giving birth to a child quickly following first marriage (Anuwoje Logubayom & Luguterah, 2013; Barber & Axinn, 1998). The third perspective is that children in a marital union constitute marital specific social capital and may be used as security towards realising a long term relationship (Josef Brüderl, 2001).

There is strong association between the timing of a first birth and age at first union, especially during the first year since first union with women aged 20 and over exhibiting a shorter interval. This has been observed in China by Feng & Quanhe (1996) and in India by Nath, Singh, Land, & Talukdar (1993). Although Feng and Quanhe (ibid) attributed it to increased sexual activity and social change, in the case of Central Uganda, this trend could be a result of late entry into first union (mean age at first birth is about 21). Women who join a first union late are likely to quicken the pace of giving birth to a first child in order to compensate for the late start and also to ensure that they get the desired number of children. Besides, women who enter the first union late are usually more fecund than those who entered the union earlier. It has also been suggested that these women suffer from enormous pressure to prove that they are fecund which usually increases the risk of getting a first birth earlier than those who enter a union while aged less than 20 (Gyimah, 2002). On the other hand, the lack of association for other variables (education, religious affiliation, employment status, birth cohort and mother's education) in this study seems to be contrary to previous observations (Copen, Kimberly, & Mosher, 2013; UBOS & Macro International Inc, 2007) and implies that they may not be powerful determinants of behaviour change in Central Uganda.

Study limitations and strength

The study is limited to Central Uganda, more specifically to women who conceived after a first union. The results may be affected by two problems. First, union formation among women is a sensitive issue thus accurate reporting of the type of first union could have been affected by

social desirability biases. Second, the survey did not collect data on coital frequency which may have had an impact on the timing of a first birth. The other limitation is that the proximate determinants and use of contraception were not considered by the study as factors which may influence the timing of the first birth. The results further suggest the need for further investigation with a bigger sample to examine the effect of cohabitation on the timing of a first birth. Such a study should also consider collecting data on coital frequency and other proximate determinants, and use of contraception as these may also have an effect on the timing of the first birth. Furthermore, although the use of lifetables and the generalised Wilcoxon test is unique, the statistical significance of estimates within categories of the same variable could not be determined.

Conclusion

In conclusion, these results have demographic implications for the study population. They suggest that any programme that encourages union formation in Central Uganda will have an impact on fertility if not accompanied by an increase in contraceptive use. The results further suggest the need for further investigation with a bigger sample to examine the effect of cohabitation on the timing of a first birth.

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Table 1 Distribution of women respondents by background characteristics, Central Uganda 2013

Variable	N (555)	Proportion of women
Women union status		
Married after cohabitation	50	9.1
Married directly	148	26.7
Still cohabiting	357	64.2
Education		
Up to primary	256	46.1
Secondary+	299	53.9
Religious affiliation		
Catholic	203	36.6
Anglican	211	38.0
Muslim	101	18.2
Others	40	7.2
Employment status		
Working	427	76.9
Not working	128	23.1
Age at first union		
Less than 20 years	366	65.9
20 years and above	189	34.1
Birth cohort		
1970-1979	169	30.5
1980-1989	284	51.1
1990-2000	102	18.4
Mother's education		
No education	227	40.9
Primary	209	37.7
Secondary	85	15.3
Tertiary	34	6.1

Figure 1 Cumulative Proportion of women having a First Birth by duration and type of first union

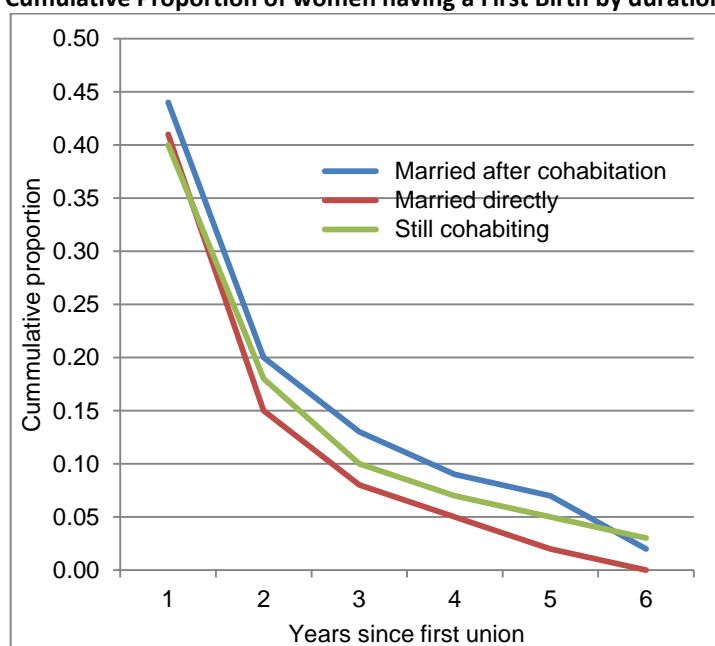


Table 2 Decrement Lifetable Estimates showing the proportion of women in union without first birth by background characteristics, Central Uganda 2013

	Years since first union					
	1	2	3	4	5	6
Women union status						
Married after cohabitation	0.44	0.20	0.13	0.09	0.07	0.02
Married directly	0.41	0.15	0.08	0.05	0.02	0.00
Still cohabiting	0.40	0.18	0.10	0.07	0.05	0.03
Education						
Up to primary	0.42	0.20	0.10	0.07	0.04	0.03
Secondary+	0.38	0.15	0.09	0.05	0.04	0.02
Religious affiliation						
Catholic	0.36	0.13	0.05	0.04	0.04	0.02
Anglican	0.41	0.18	0.12	0.09	0.04	0.03
Muslim	0.44	0.25	0.15	0.07	0.03	0.02
Employment status						
Working	0.42	0.18	0.11	0.07	0.04	0.03
Not working	0.34	0.15	0.05	0.05	0.03	0.01
Age at first union						
Less than 20 years	0.45	0.21	0.11	0.07	0.05	0.03
20 years and above	0.30	0.11	0.06	0.05	0.03	0.02
Birth cohort						
1970-1979	0.39	0.15	0.09	0.07	0.04	0.02
1980-1989	0.42	0.19	0.09	0.06	0.05	0.03
1990-2000	0.34	0.12	0.08	0.06	0.02	0.01
Mother's education						
Primary	0.39	0.19	0.09	0.06	0.04	0.03
Secondary	0.34	0.16	0.08	0.04	0.02	0.01
Tertiary	0.44	0.15	0.12	0.09	0.06	0.06

Table 3: Results of Cox proportional hazards regression showing the relative risk of the timing of the first birth following First Union by Background Characteristics, central Uganda 2013

Covariates	Hazard Ratio (HR)	95% Confidence Interval (CI)	
Woman's union type			
Married after cohabitation®			
Married directly	1.15	0.791	1.675
Still cohabiting	1.05	0.739	1.491
Education			
Upto Primary®			
Secondary and higher	0.94	0.760	1.167
Religion			
Catholic®			
Anglican	0.88	0.713	1.089
Muslim	0.89	0.673	1.171
Other	0.93	0.649	1.367
Employment Status			
Working®			
Not working	1.11	0.882	1.404
Age at first union			
Less than 20 years®			
20 years and above	1.26*	1.022	1.576
Birth cohort			
1970-1979®			
1980-1989	0.97	0.770	1.214
1990-2000	1.17	0.854	1.601
Mother's Education			
No education®			
Primary	1.03	0.833	1.262
Secondary	1.05	0.788	1.411
Tertiary	0.82	0.522	1.283
-Likelihood	2514.5		

* p<0.05; ® Reference category