

## FACTORS AFFECTING AGE AT MARRIAGE AND AGE AT FIRST BIRTH IN INDIA

S. CHANDRASEKHAR<sup>1</sup>

### Abstract

*Using NFHS 2005 data, we estimate a cox proportional hazard model to identify the determinants of age at marriage and age at first birth. We find that women who grew up in the countryside or in towns are more likely to marry early and have children earlier. We find a similar result for women living in the slums. Women who have completed primary schooling higher are less likely to marry early compared to those without any education. We also establish the negative relationship between educational attainment and prevalence of underage marriage using Census 2001 data.*

**Keyword:** Age at marriage, Age at first birth, India

**JEL Classifications:** J1, J12

### Introduction

South and Southeast Asia have witnessed a large increase in educational attainment. Yet it is not true that this region has experienced the largest decline in early marriage. In fact, the largest declines have been observed in the Middle East (Mensch et al., 2005). The pressing need to increase age at marriage among women within South Asia, especially in Bangladesh, India and Nepal has long been recognized. In South Asia, 45 per cent of women aged 20–24 years were married as children. Worldwide there are 60 million women aged 20-24 years who were married before the age of 18 years. Of these women around 50 percent of them live in South Asia (UNICEF 2007). In fact, even within south Asia there are marked differences across the countries. Pakistan has the highest median age at marriage among women aged 25-49 years. It is 18.8 years in rural and 19.7 years in urban Pakistan. In contrast, in rural and urban India, the median age at marriage among women aged 25-49 years is 16.8 years and 18.7 years respectively. Within India, there are large variations in age at marriage across the various states (International Institute for Population Sciences and Macro International 2007).

Given the high proportion of women getting married before the age of 18 years in India, there is a large literature focusing on determinants of age at marriage and its consequences (Bhat and Halli 1999, Caldwell et.al. 1983, Caldwell et.al. 1998, Santhya et. al. 2008). The need to delay the age at marriage has been part of the policy discourse this decade. These issues

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**Acknowledgements:** I have benefited from discussions with Tesfayi Gebreselassie and Anuja Jayaraman. I am grateful for comments from a referee of this journal. The usual disclaimer applies.

have been discussed in various policies and legislations including the National Population Policy 2000, National Youth Policy 2003, National Policy for the Empowerment of Women 2001, and Prohibition of Child Marriage Act 2006.<sup>2</sup> A recent study documented the existence of 58 policies and programs aimed at addressing the issue of early marriage in India (Das Gupta et. al. 2008). Of these 58, there were 7 national or state level policies, 17 programmes initiated by the government, and 34 programmes initiated by non governmental organizations.

Recently, the 18<sup>th</sup> Law Commission<sup>3</sup> constituted by the Government of India, in its report on 'Proposal to Amend the Prohibition of Child Marriage Act, 2006 and Other Allied Laws' examined issues pertaining to child marriage and age at marriage. There is a view that compulsory registration of marriages could lead to a reduction in the prevalence of child marriages. Offering this as the rationale, the Commission recommended that the government make it mandatory for all marriages to be registered.

Actually, in 2007, the Supreme Court of India directed the state governments to take steps for registration of marriages. It also noted that the state governments of Andhra Pradesh, Bihar, Chhattisgarh, Goa, Madhya Pradesh, Karnataka, Meghalaya, Mizoram, Rajasthan, Sikkim, Tamil Nadu, and Tripura have already enacted laws for registration of marriages.

The Law Commission was also of the view that there is no basis for continuing with the practice of different legal age of marriage for boys and girls. Currently, in India the legal age for marriage is set at 18 years for women and 21 years for men. It recommended that the legal age be set at 18 years for both boys and girls. This would imply that the differences in the age of the spouses can be expected to narrow. From the National Family Health Survey (NFHS) data, one does not find any stark variation in the difference in the age of the woman and her husband over the various age groups. One might expect to find younger women marrying men closer to their age. However, we do not find any such pattern. Among women in the age group 45-49 years, 58 percent of them married a man who was less than 5 years older to them. In contrast among women in the age group 20-24 years, nearly 56 percent of them married a man who was less than 5 years older to them (Table 1). If one does find a difference in spousal characteristics, it is in the context of educational attainment. Compared to women in the age group 40-44 years, the proportion of women in the age group marrying men without education is lower at 22 percent

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<sup>2</sup> At the request of The Supreme Court of India, the 18<sup>th</sup> Law Commission addressed the need to specify the age for defining who is a child since the age used to define who is a child is different under various laws and legislations. The Commission recommended that "there is no rationale for stipulating different ages for consent to sexual intercourse for a minor bride and for other minor girls" (The Law Commission of India 2008, p.43). One of the criticisms of the Prohibition of Child Marriage Act (PCMA), 2006 was that it did not invalidate marriages below a certain age. In 1995-96, the National Commission for Women in its report had 'recommended that child marriages be declared void'. In light of this the Law Commission recommended that child marriage below the age of 16 years is made void and that the age of consent for sexual intercourse for all girls be set at 16 years. In case of marriages between 16 – 18 years, the Commission recommended that the either party should have the option to void the marriage. This is a welcome step in the sense that they give child brides an easy exit option. More importantly, the stipulation under the PCMA to provide maintenance to the 'female party' till her remarriage was extended to the girl child whose marriage is declared void.

<sup>3</sup> The Law Commission is set up by the Ministry of Law and Justice, Department of Legal Affairs, Government of India. "It recommends legislative reforms with a view to clarify, consolidate and codify particular branches of law".

compared to 30 percent (Table 2). This is not surprising since there has been an improvement in educational attainment among men and women.

Changes in age at marriages have implications for fertility. An increase in the age at marriage reduces the number of years available for child bearing. If women opt to attain higher levels of education, they might decide to marry late, thus postponing the age at which they have their first child. However, in India, although the age at marriage has increased the gap between age at marriage and onset of motherhood has declined.<sup>4</sup> It would be of interest to make the following two comparisons: compare the median age at marriage for those in the age group 20-24 years with those in the age group 40-44 years and compare the median gap between age at marriage and onset of motherhood across these two age groups. The median gap between age at marriage and onset of motherhood has decreased by 5 months in rural areas though the median age at marriage increased by one year (Figure 1). Researchers have arrived at similar findings based on analysis of data from other countries (Mensch et al. 2003). It is conjectured that the need for women to prove fecundity is the reason for this phenomenon.

From a policy perspective, there are compelling reasons for why the issue of under age marriage, and age at first child needs to be tackled. Women who marry early are less likely to be informed about reproductive matters and could face higher risks of ill-health and mortality. From household surveys, it has been shown that early marriage affects the nature of interaction with the husband and also reduces the ability of the woman to take independent decisions. The proportion of women reporting domestic violence is higher among those who married early compared to those who married later (International Institute of Population Sciences and Population Council 2008d).

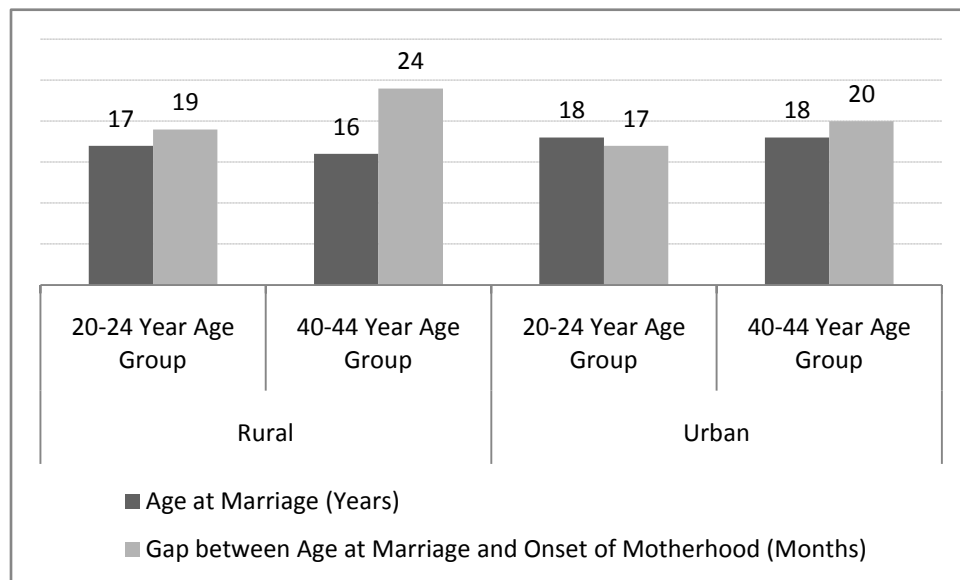
**Table 1. Are Woman Marrying Men Closer to their Age?**

| <i>Age of Woman</i> | <i>Husband Older by</i> |                   |                    |                      |              |
|---------------------|-------------------------|-------------------|--------------------|----------------------|--------------|
|                     | <i>0-5 Years</i>        | <i>5-10 Years</i> | <i>10-15 Years</i> | <i>Over 15 Years</i> | <i>Total</i> |
| 15-19               | 53.31                   | 36.87             | 7.89               | 1.92                 | 100          |
| 20-24               | 55.97                   | 33.76             | 8.24               | 2.03                 | 100          |
| 25-29               | 56.35                   | 33.6              | 7.92               | 2.14                 | 100          |
| 30-34               | 55.38                   | 33.74             | 8.21               | 2.68                 | 100          |
| 35-39               | 56.51                   | 31.67             | 8.98               | 2.85                 | 100          |
| 40-44               | 52.44                   | 34.04             | 8.99               | 4.53                 | 100          |
| 45-49               | 57.99                   | 29.19             | 10.29              | 2.53                 | 100          |
| Total               | 55.57                   | 33.25             | 8.53               | 2.64                 | 100          |

<sup>4</sup> Sabu et al (2004) find that in Andhra Pradesh, compared to the older generations, younger women decide to end childbearing faster. They attribute this to acceptance of sterilization procedures among younger women.

**Table 2. Are Women Marrying Men who are more Educated than them?**

|                                 | <i>Education of Husband</i> |                |                  |               |                   | <i>Total</i> |
|---------------------------------|-----------------------------|----------------|------------------|---------------|-------------------|--------------|
|                                 | <i>No Education</i>         | <i>Primary</i> | <i>Secondary</i> | <i>Higher</i> | <i>Don't know</i> |              |
| <b>Age of Women 20-24 Years</b> |                             |                |                  |               |                   |              |
| No Education                    | 44.02                       | 17.71          | 34.93            | 2.03          | 1.31              | 100          |
| Primary                         | 19.77                       | 23.76          | 52.11            | 3.53          | 0.82              | 100          |
| Secondary                       | 5.63                        | 9.01           | 68.88            | 16.17         | 0.31              | 100          |
| Higher                          | 0.28                        | 0.8            | 34.7             | 64            | 0.22              | 100          |
| All                             | 22.53                       | 14.29          | 51.47            | 10.93         | 0.78              | 100          |
| <b>Age of Women 40-44 Years</b> |                             |                |                  |               |                   |              |
| No Education                    | 49.22                       | 20.69          | 27.33            | 2.05          | 0.71              | 100          |
| Primary                         | 12.04                       | 25.06          | 56.6             | 5.77          | 0.53              | 100          |
| Secondary                       | 3.12                        | 7.8            | 66.4             | 22.57         | 0.1               | 100          |
| Higher                          | 0.41                        | 0.03           | 19.48            | 80.08         | 0                 | 100          |
| All                             | 29.42                       | 17.14          | 41.06            | 11.89         | 0.5               | 100          |

**Figure 1. Age at Marriage and Onset of Motherhood**

This paper addresses the issue of age at marriage and age at first child in the Indian context. We use the unit level data from the National Family Health Survey – 3 (NFHS-3) conducted in 2005-06 to estimate survival models of age at first birth and age at first child. In addition to examining differences in age at marriage among married women currently living in rural and urban areas, we also examine whether there are differences across married women currently living in capital city, town and small city. Given the burgeoning slum population, we seek to understand the difference in age at marriage across women living in slums and non-slum urban areas. We complement the findings based on survival model using data from Census 2001, in particular to discern incidence of under-age marriage and also to examine the degree of association between change in level of educational attainment and change in age at marriage.

## Data

In this paper we draw upon two data sets: NFHS-3 2005 and Census of India 2001. The NFHS data has information on age at marriage, age at first birth, household and individual characteristics. It covers a total of 67,424 women from rural and 56,961 women from urban areas in the 15-49 years age group. Details on the survey procedures and sampling design are available in the main survey report (International Institute for Population Sciences and Macro International 2007). We use this data to investigate the determinants of age at first marriage and age at first birth. The unit of observation is an individual woman between 15-49 years of age and outcomes of interests are age at which a woman had her first marriage and the age at which a woman delivered her first child. Within urban areas, we know whether the woman resides in the capital city, town or small city. We use this information to specifically focus on whether there are differences in age at women among married women who live across the three types of urban areas. For the following eight cities, Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur there is information on whether the household resides in the slum or in the non slum urban area of the city. There are two identifiers for slum households in the data set: based on Census 2001 classification of slums and based on slum designation by supervisor (as observed during fieldwork). We use the classification used by the supervisor when we analyze outcomes for these eight cities.

Although Census 2001 data does not have household or individual characteristics, it has detailed tables on age at marriage for every state. We use this data to complement our findings based on analysis of NFHS-3 data.

## Empirical Model: Age at Marriage & Age at First Child

We estimate the Cox proportional hazard model to identify the correlates of the age at first marriage and age at first child birth. The two variables of interest, age at first marriage and age at first child birth, measure time until the occurrence of the event. Since the analysis includes women who have not yet experienced the events resulting in right censoring of the data, the use of Cox proportional hazard model is appropriate. The Cox proportional hazard is defined as:

$$\theta(t, X_i) = \theta_0(t) \exp(\beta' X_k) = \theta_0(t) \lambda_i = \theta_0^*(t) \lambda_i^*$$

where  $t$  is the survival time,  $\beta$  is parameter to be estimated,  $\theta(t, X_i)$  is the hazard rate at survival time  $t$  for individual  $i$  with fixed covariates ( $X$ ),  $\theta_0$  is the baseline hazard function that is dependent on  $t$  but not  $X$ , and  $\lambda$  is person specific non-negative function of covariates  $X$  (Jenkins, 2005).

In line with the literature, we include the following variables in order to model the determinants of age at marriage. We include location where the woman currently resides (countryside, town, small city, large city), her previous place of residence (countryside, town, small city), the social group and religion of the household, education of the woman (no education, primary schooling, secondary, higher), age categories (15-24, 25-34, 35-49 and the state that she currently resides in.<sup>5</sup>

It is well documented that the total fertility rate in the slums is higher than in the non slum urban areas. It is possible that the age at marriage is lower in the slums than in the non slums. This could contribute towards higher fertility rate in the slums. In order to address the issue we re-estimate the survival model by restricting the sample to the following cities for which we have information on slum and non slum households: Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur. In this specification we include whether the woman resides in the slum or non slum urban areas of the city.

It should also be borne in mind that culture, tradition and societal norms are key non-economic factors that affect age at marriage. In addition, the economic status of the household at the time of marriage of the woman and other characteristics of the family including education attainment of the parents are also important. Among other family specific variables that affect the age at marriage, include marriage characteristics of the parental generation, kin status of parents, nature of material exchange at marriage, social networks (Bernardi 2003; Montgomery and Casterline 1996), and the role of neighbors and neighborhood (Yabiku 2006). However, such information is not available not only in the NFHS-3 data but also in the Demographic Health Surveys.

Finally, we need to briefly address, two variables of interest which ideally should have been included in the analysis. In order to explore the relationship between fertility decisions and infant mortality rates, ideally, we should have included district level estimates of under-five mortality rates in the model. There is evidence to suggest a relationship between lower levels of mortality and delayed motherhood (LeGrand and Barbieri 2002). However the NFHS-3 does not have district identifiers in the data set. For a similar reason we are unable to include the prevalence of child labor in each district as an additional control. One would have expected that higher the incidence of child labor higher would be the demand for children and earlier would be the age at first birth. Given the large differences in under five mortality and incidence of child labor across the states of India, we believe that the inclusion of state dummies in the analysis partially captures these two variables.

Table 3 reports the summary statistics of the variables used in the analysis.

## Results

Table 4 presents the results from the proportional hazard models for age at first marriage, and the results of the survival analysis for age at first birth. The hazard rate reported in the tables is the probability of occurrence of an event at a given time if it has not already occurred. Robust standard errors were calculated after taking into account clustering.

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<sup>5</sup> We did not use any measure of socio economic status of the household since the information available is indicative at the time of the survey and not at the time of the marriage or at time of childbirth.

**Table 3. Summary Statistics**

|  |                                      |
|--|--------------------------------------|
| Median age at first marriage             | 18.1 years                           |
| Median age at first birth                | 19.6 years                           |
|  | Percent (unless otherwise mentioned) |
| <b>Last Residence</b>                    |                                      |
| Countryside                              | 66.4                                 |
| City                                     | 18.2                                 |
| Town                                     | 15.4                                 |
| <b>Current Residence</b>                 |                                      |
| Country Side                             | 54.2                                 |
| Large City                               | 21.2                                 |
| Small City                               | 7.5                                  |
| Town                                     | 17.1                                 |
| <b>Years lived in place of residence</b> |                                      |
| Length of Stay                           | 17.10 years                          |
| <b>Social groups</b>                     |                                      |
| Scheduled caste                          | 16.6                                 |
| Scheduled tribe                          | 13.3                                 |
| Other backward class                     | 31.9                                 |
| Groups                                   | 38.2                                 |
| <b>Religion</b>                          |                                      |
| Hindu                                    | 72.4                                 |
| Muslim                                   | 13.5                                 |
| Christian                                | 8.8                                  |
| Sikh                                     | 5.3                                  |
| Buddhist                                 |                                      |
| <b>Education</b>                         |                                      |
| No Education                             | 32.0                                 |
| Primary                                  | 14.3                                 |
| Secondary                                | 43.3                                 |
| Higher                                   | 10.4                                 |
| <b>Age category</b>                      |                                      |
| 15–24                                    | 37.6                                 |
| 25–34                                    | 31.0                                 |
| 35 plus                                  | 31.4                                 |

We find that women who live in the countryside are more likely to have married earlier and have children earlier compared with married women living in a large city. We find a similar result for women living in towns and small cities. We also find that women whose last place of residence was in rural India or towns are at higher risk of marriage compared to those whose last place of residence was a city. Women who have lived longer at the current place of residence are likely to marry earlier but this is probably reflecting the age of the woman rather than any

characteristic of their place of residence. Women from older age cohorts married earlier compared to women in the younger age groups.

**Table 4. Hazard Rate of the Cox Proportional Hazard Model for Age at First Marriage and Age at First Birth**

|  | <i>Marriage</i>     |             | <i>Birth</i>        |             |
|--|---------------------|-------------|---------------------|-------------|
|  | <i>Hazard Ratio</i> | <i>S.E.</i> | <i>Hazard Ratio</i> | <i>S.E.</i> |
| <b>Current Place of Residence (Large City)</b> |                     |             |                     |             |
| Countryside                                    | 1.14**              | 0.01        | 1.03**              | 0.01        |
| Town   | 1.06**              | 0.01        | 1.02                | 0.01        |
| Small City                                     | 1.05**              | 0.02        | 1.02                | 0.02        |
| <b>Last Place of Residence (City)</b>          |                     |             |                     |             |
| Rural  | 1.97**              | 0.02        | 1.63**              | 0.02        |
| Town   | 1.77**              | 0.02        | 1.54**              | 0.02        |
| <b>Length of Stay</b>                          |                     |             |                     |             |
|  | 1.01**              | 0.00        | 1.01**              | 0.00        |
| <b>Social Group (Others)</b>                   |                     |             |                     |             |
| Scheduled Caste                                | 1.15**              | 0.01        | 1.12**              | 0.01        |
| Scheduled Tribe                                | 0.99                | 0.01        | 1.01                | 0.01        |
| Other Backward Class                           | 1.05**              | 0.01        | 1.03**              | 0.01        |
| <b>Religion (Hindu)</b>                        |                     |             |                     |             |
| Muslim   | 1.07**              | 0.01        | 1.14**              | 0.01        |
| Christian                                      | 0.82**              | 0.01        | 0.91**              | 0.02        |
| All Other Religions                            | 0.83**              | 0.01        | 0.91**              | 0.02        |
| <b>Education (No Education)</b>                |                     |             |                     |             |
| Primary Education                              | 0.84**              | 0.01        | 0.91**              | 0.01        |
| Secondary Education                            | 0.52**              | 0.00        | 0.62**              | 0.01        |
| Higher Secondary Education                     | 0.25**              | 0.00        | 0.31**              | 0.00        |
| <b>Age Group (35-49 Years)</b>                 |                     |             |                     |             |
| 15-24 Years                                    | 0.79**              | 0.01        | 0.80**              | 0.01        |
| 25-34 Years                                    | 1.02*               | 0.01        | 1.07**              | 0.01        |

State Dummies not Reported

N = 121354

Ideally, we need to have information on place of childhood of the woman. However, the data does not have this information. So one needs to be clear on what the current location and earlier place of residence of the married woman might actually reflect. Does it capture an unobserved characteristic of the woman?



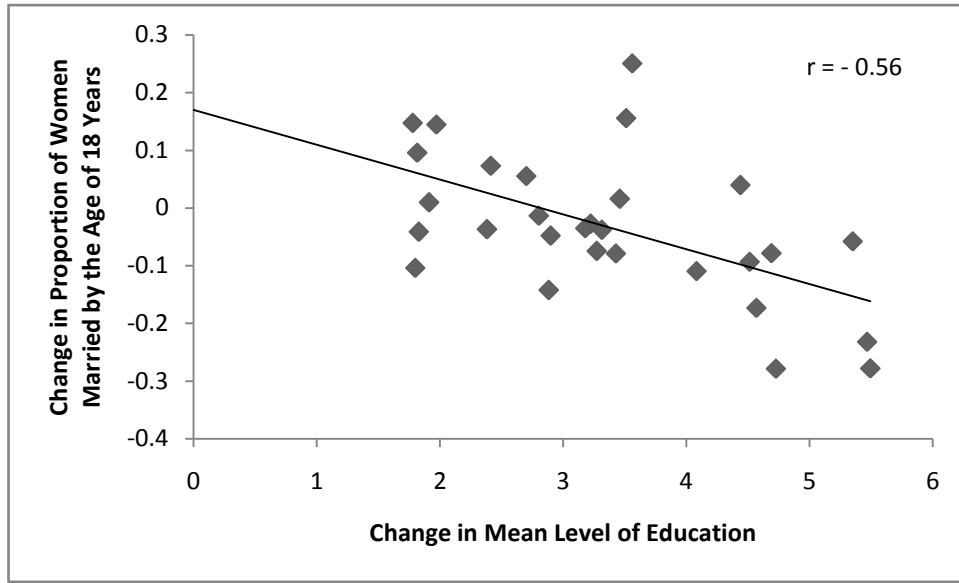
In India, from Census of 2001 data it is apparent that migration is predominantly an intra-state phenomenon with over 85 percent of migrants moving within the same state. Further, rural-rural migration is the predominant stream of migration flows. Specifically, in context of women, nearly 65 percent of women report moving on account of marriage. In light of this it is reasonable to argue that there is correlation between current place of residence and place of childhood in case of currently married women.

We find differences social groups and across religious groups. Women from scheduled caste households and other backward classes are likely to marry earlier than women from other social groups. We do not find the coefficient for women from scheduled tribe households to be significant. Compared to women who report to be Hindus, Muslims are likely to marry earlier. Christians and women from other religious groups are likely to marry later compared to Hindus.

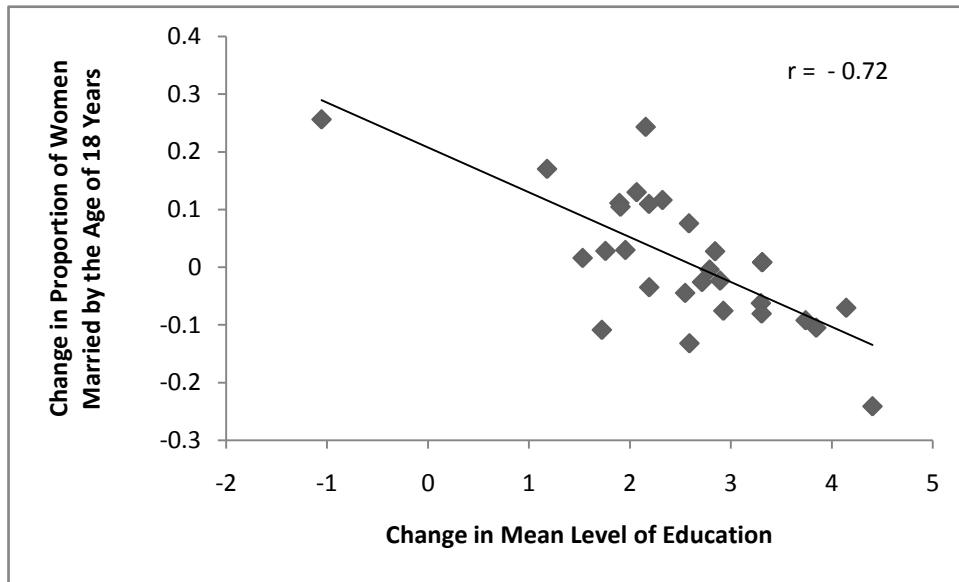
There is considerable interest in understanding how an increase in educational attainment affects the age at marriage. Would an increase in level of educational attainment reduce the probability of being married before the age of 18 years? Based on survival analysis we find that women who have completed primary schooling, secondary schooling or higher are less likely to marry early compared to those without any education. The relationship is strictly monotonic.

Other studies have established a negative correlation between educational attainment and age at marriage and fertility decisions. However, the exact relationship between education and fertility decisions are difficult to decompose statistically since marriage decisions are affected by a multitude of factors. First, one needs to make assumptions on the temporal nature of decision making, unobserved heterogeneity, and endogeneity when examining the following outcome variables: educational attainment, marriage decisions, and fertility (Eloundou-Enyegue 1999). If education is considered a choice variable, then it could lead to a delay in age at marriage. Alternatively, the characteristics of households where women are encouraged to accumulate human capital could be different and this affects marriage and fertility decisions. In order to uncover the exact mechanisms one would need detailed life histories. In the absence of such information, in the literature on age at marriage, in the context of developing countries, authors have used educational as an explanatory variable of age at marriage and fertility. For instance in case of Nepal, Choe et al. (2005) found that in addition to place of residence and ethnicity, education was an important determinant of age at marriage.

A pertinent question in Indian context is whether increasing educational attainment of girls would lead to a reduction in incidence of under-age marriage. In order to address this issue in greater detail, we use Census 2001 data and adopt the line of reasoning followed by Mensch (2005). Using NFHS-3 data, for each Indian state, we calculate the difference in the proportion of women aged 20-24 years who report having been married before the age of 18 years and proportion of women aged 40-44 years who report having been married before the age of 18 years. Similarly, for each Indian state, we calculate the difference in the average level of educational attainment among women aged 20-24 years and 40-44 years. In Figures 2a and 2b we have plotted the change in proportion of women aged 20- to 24 years and 40-44 years married by the age of 18 years and change in mean level of education in rural and urban areas respectively. Notice that in line with expectations, we find a negative relationship.



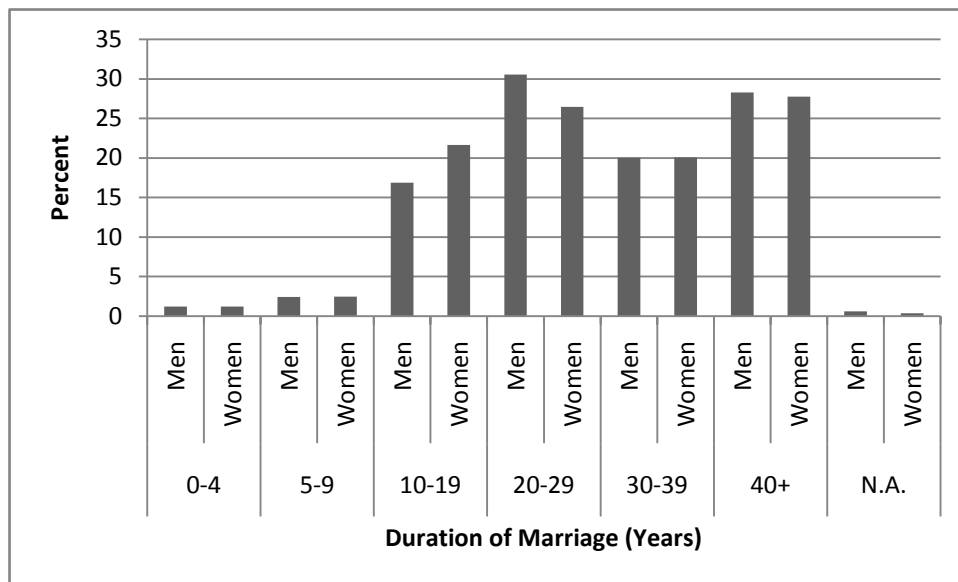
**Figure 2a. Scatter Plot of Change in Proportion of Women Aged 20- to 24 Years and 40-44 Years Married by the Age of 18 Years and Change in Mean Level of Education in Rural Areas (Calculations based on NFHS-3 data for 29 Indian States)**



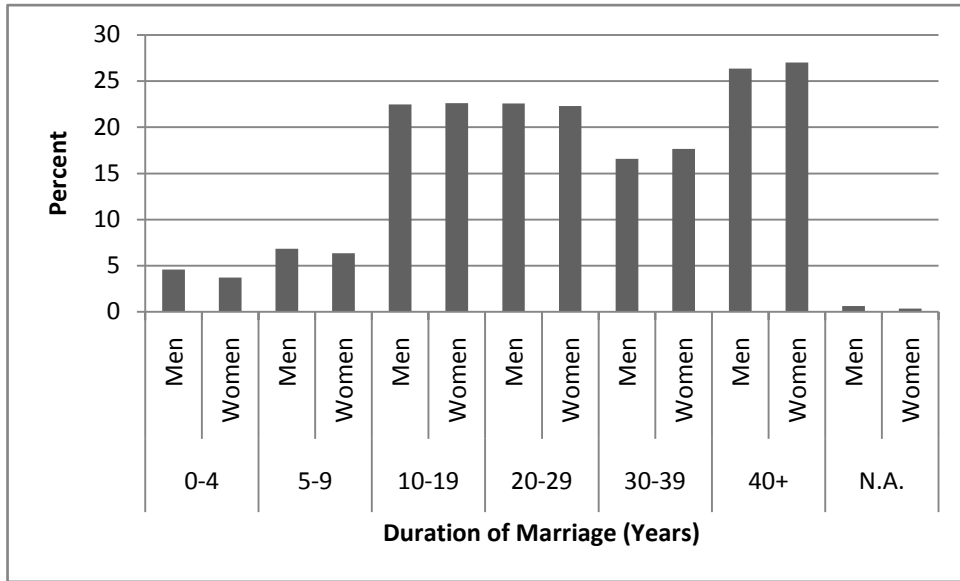
**Figure 2b. Scatter Plot of Change in Proportion of Women Aged 20- to 24 Years and 40-44 Years Married by the Age of 18 Years and Change in Mean Level of Education in Urban Areas (Calculations based on NFHS-3 data for 29 Indian States)**

We find that women in the younger age groups (15–24 and 25–34) are less likely to marry earlier compared to women in the oldest age group (35–49). This finding is consistent with the trends which suggest that younger women are marrying later as compared to women belonging to older age cohorts.

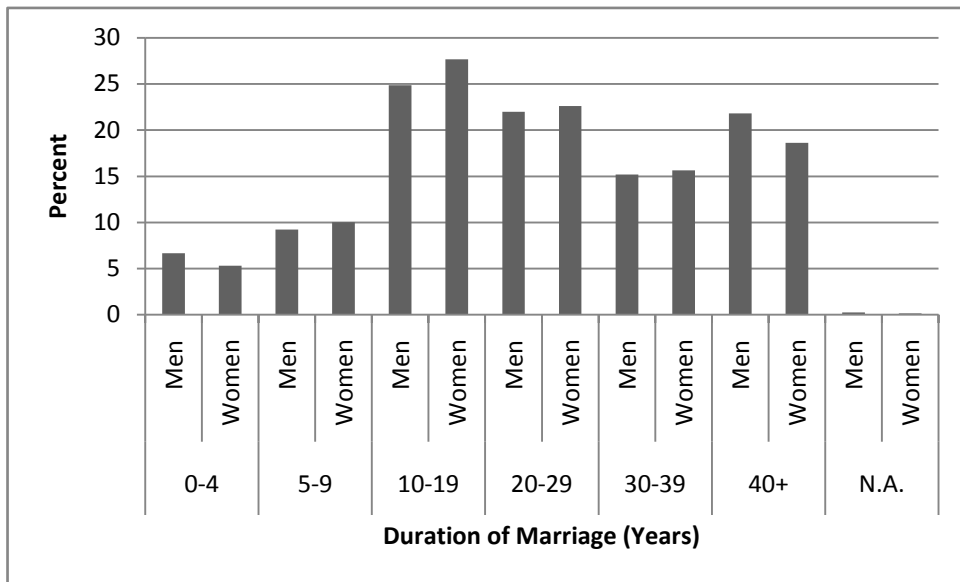
Data from Census of India 2001 provides an alternative way of examining this issue, in particular the issue of under-age marriage across age cohorts. We examine the distribution of duration of marriage for women who were married before they were 10 years of age, married when they were 10-11, 12-13, 14-15 and 16-17 years of age (Figures 3a-3e). We do not have the break up separately for rural and urban areas. Among those who report having got married when they were not even 10 years old, we find that 79 percent of women and 74 percent of men have been married for at least 20 years (Figure 3a). In contrast, we find a different picture among those who married when they were 16-17 years of age. In this age group, 56 percent of men and 62 percent of women have been married for less than 20 years (Figure 3e). This implies that the incidence of marriage at an age of less than 18 years has declined.



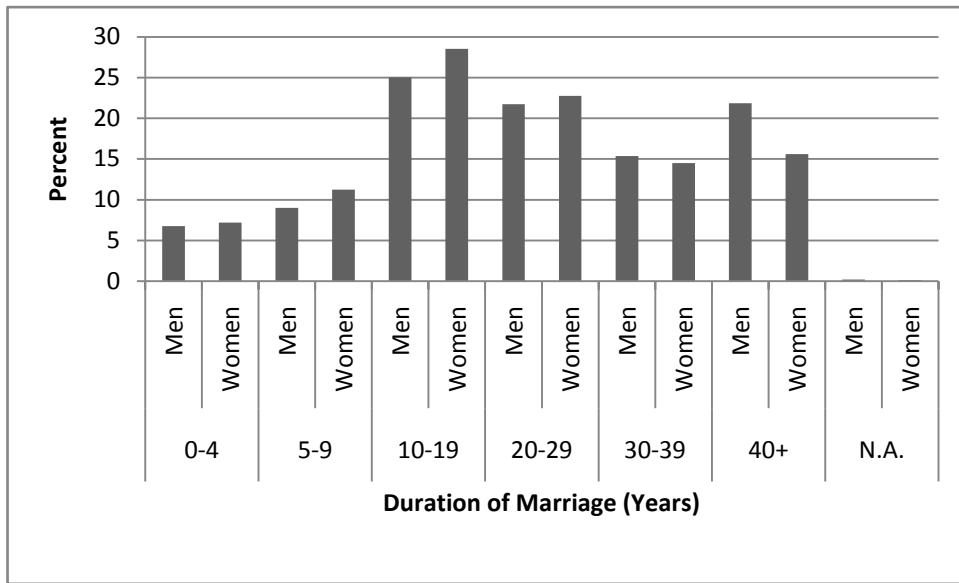
**Figure 3a: Distribution of men and women who were married before the age of 10 years by duration of marriage**



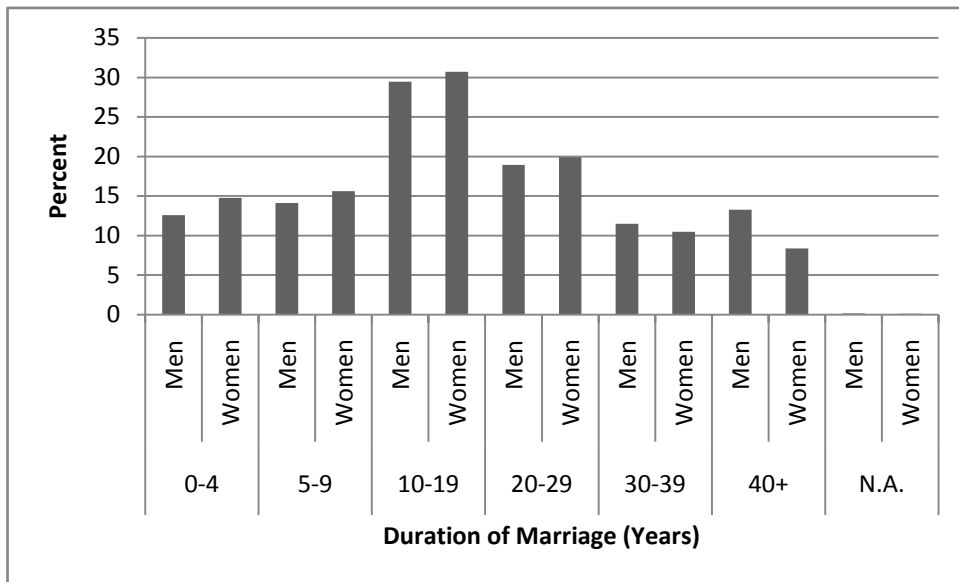
**Figure 3b: Distribution of men and women who were married at the age of 10-11 years by duration of marriage**



**Figure 3c: Distribution of men and women who were married at the age of 12-13 years by duration of marriage**



**Figure 3d: Distribution of men and women who were married at the age of 14-15 years by duration of marriage**



**Figure 3e: Distribution of men and women who were married at the age of 16-17 years by duration of marriage**

These numbers, of course, mask variations across the states of India. The pattern that emerges across the states is in line with the differences in the mean and median age at marriage

and whether the state has a long tradition of child or under-age marriages. The mean age at marriage among women varies from 16.6 years in Rajasthan to 22.2 in Goa. Within the four major southern states, viz. Andhra Pradesh, Karnataka, Kerala and Tamil Nadu we observe difference in the mean age at marriage. It ranges from 17.5 years in Andhra Pradesh to 20.8 years in Kerala. In the following seven states the mean age at marriage is below the legal age of 18 years: Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Rajasthan and Uttar Pradesh. Of these seven states, barring Jharkhand and Uttar Pradesh, the other states have passed laws relating to registration of marriages.

The analysis based on survival analysis using NFHS-3 data reflects differences across the states of India that are evident from Census data. Some of the differences are driven by cultural norms. For instance in Rajasthan, on occasions like Akha Teej, which falls in the month of April- May, mass marriages of children are very common. One recent notable study focuses on the youth in the following six states of India: Andhra Pradesh, Bihar, Jharkhand, Maharashtra, Rajasthan, and Tamil Nadu (International Institute of Population Sciences and Population Council 2008a-c, 2007a-c) provides interesting insights on whether economic development by itself can lead to a reduction in prevalence of underage marriage. This study brought out the fact that incidence of under age marriage can be prevalent even in states with a higher level of overall development. "Even though the state of Maharashtra is one of the most socially and economically progressive states in the country, Youth Study findings underscore the prevalence of early marriage among young women in the state. Of those aged 20–24, almost one in 10 young women was married before age 15 and over one-third before age 18. ... 46 percent of rural young women compared to 22 percent of urban young women were married before age 18. In contrast, just 2 percent of young men aged 20–24 were married before age 18" (p.1 International Institute of Population Sciences and Population Council 2008d). This suggests that higher level of economic development by itself will not make a dent in prevalence of under-age marriage. Addressing cultural norms should be a priority.

We now turn to the issue of age at first birth and discuss the key results (Table 4). We find that women residing in rural areas are more likely to have their first child earlier than those residing in urban areas. One implication of this finding is that it is important to ensure higher rates of contraceptive use in rural areas. This is an important issue since women who have a child early are less likely to be informed about reproductive matters. They also face higher risks of ill-health and mortality. For instance in Maharashtra, one of the more developed states of India, only 6 percent of women who married early used contraceptives to delay the first pregnancy as against 15 percent of women who married later. Similarly patterns are observed in case of institutional delivery of the first birth and women experiencing at least one pregnancy loss (International Institute of Population Sciences and Population Council 2008d).

Availability and use of contraceptives in rural areas is lower in rural compared to urban areas. A comparison of data from NFHS-1 and NFHS-3 reveals that over the period 1993-94 to 2005-06, in rural areas the proportion of women using any form of contraception increased from 37 percent to 53 percent. However, in 2005-06, nearly 15 percent of rural women reported unmet need for family planning. In urban areas, in 2005-06, 64 percent of women reported using contraceptives and 10 percent of them reported unmet need for contraception. The urban averages, of course, mask differences across towns, small cities and large cities. Given the

relatively low age at marriage in India, it is important to increase rate of contraceptive use, decrease unmet need to offset the impact of early marriage on fertility.

We find that the impact of social group and religion on age at first birth are similar to the results from the survival analysis relating to age at marriage.

We now turn to a discussion of differences in age at marriage and age at child birth for the eight cities where information is available on slum dwellers. Instead of presenting the estimates based on survival analysis for these states, we instead report the life tables for comparing patterns in age at marriage across women living in the slum and non slum areas of the cities. For women living in the slums the hazard ratio declines to 0.50 among women in the age group 18-19 years. When we consider women living in the non slum areas of these cities the hazard ratio declines to below 0.5 among women in the age group 20-21 years. This clearly brings out the fact that women residing in slums married earlier compared to this living in the non slum areas of the city. Similarly, we report the life tables for comparing patterns in age at first child. For women living in the slums the hazard ratio declines to 0.50 among women in the age group 20-21 years. When we consider women living in the non slum areas of these cities the hazard ratio declines to below 0.5 among women in the age group 22-23 years.

Our finding that there are differences in age at marriage and age at which the women has her first child has implications for explaining the fertility rates across households residing in the slum and non slum areas of the cities. Our results provide one plausible explanation for the finding that the total fertility rate in the slums is higher than in the non slum urban areas.<sup>6</sup> Since the age at marriage among women residing in the non slums is lower, they have fewer years for child bearing, as compared to women living in the slums. This translates into lower fertility rates in the non slum urban areas.

## Conclusion

There are concerns that in South Asia and in particular India the substantial improvements in education attained by women has not translated into a substantial increase in age at marriage. Since the beginning of 1990's the Indian economy has undergone structural changes. It has become more urban. Literacy among women and levels of educational attainment has increased. Workforce participation rate among women has increased. However, one does not observe a steep reduction in proportion of women marrying early. Using the National Family Health Survey 2005 data we estimate a Cox proportional hazard model to identify the determinants of age at marriage and age at first birth. We find that where there has been an increase in age at marriage there has been a reduction in the interval between age at marriage and age at first birth. In sync with the policies aimed at increasing the age marriage it would be useful to ensure that the rate of contraceptive use is increased. In order to focus on educational attainment as a key driver in effecting a reduction in age at marriage we used Census 2001 data. We found a negative relationship between incidence of underage marriage and educational attainment. Recently a slew of legislations and programmes have been formulated to address the

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<sup>6</sup> As per the National Family Health Survey (1998-99), TFR in rural Maharashtra was 2.74 and in urban areas it was 2.24. For urban Maharashtra (not including Mumbai) the TFR is 2.24 while for metropolitan Mumbai it is 2.13. There are differences within Mumbai with the TFR much higher at 2.69 in the slum areas and in the non-slum areas the TFR is 1.40 (Government of Maharashtra 2002).

issue of underage marriage. Eventually, in addition to legislation, from a programmatic perspective studies a three pronged approach needs to be adopted: intensify the efforts to eliminate practice of early marriage, work with parents, and support newly wed young women. Such interventions are particularly needed to break social norms and customs. Whether compulsory registration of marriages will have a tangible effect in terms of reducing marriages before the legal age of 18 years only time will tell.

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