

Determinants of SMAM and Age at Marriage in North East India

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Abstract

Marriage is a principal indicator of women's exposure to the risk of pregnancy and as such early age at marriage in a population is usually associated with a longer period of exposure to the risk of pregnancy and higher fertility levels. In this context, the age at marriage has acquired an important topic of discussion. In this paper we investigate the socio-economic variations of Singulate Mean age at Marriage (SMAM) and Age at First Marriage using data from Census 2011 and NFHS-3 for the eight North-east states of India. SMAM and age at first marriage are computed and a logistic regression model is fitted to assess the risk of marriage among socio-economic groups. Findings from the study show that SMAM for Hindu women tend to be higher as compared other religious groups. Rural women are higher risk of early marriage than their urban counterparts. Also, women with higher education marry later than low educated women.

Key words: Marriage, Fertility, SMAM, Logistic Regression.

1. Introduction

In view of the rapid growth of population in the developing countries of the world, the in-depth study on the factors contributing to high fertility resulting in the rapid growth of population and the differentials across groups of socio-economic characteristics has been of paramount importance. A substantial amount of literature indicates the study of high fertility reasons across the different parts of the world. It is quite evident that the rate of population growth varies from region to region, country to country and from one community to another within the country or state. Region specific study of high fertility differentials across various socio-economic groups within the country or region should be studied to provide regional or community level information on fertility from time to time. These information could help the policy makers and programme planners in such a way that they can perform well to achieve their development goals.

Marriage has been studied as an important factor which influence the fertility of a particular country or region or community. Marriage is a principle indicator of women's exposure to the risk of pregnancy and as such early age at marriage in a population is usually associated with a longer period of exposure to the risk of pregnancy and higher fertility levels. In developing countries like India age at marriage is very low and an upward shift in it can reduce the fertility level. In this context, the age at marriage has acquired an important topic of discussion.

Fertility levels in most populations can be explained by five key proximate determinants that define the risk to pregnancy. They are marriage, sexual intercourse, postpartum amenorrhea and postpartum abstinence, onset of menopause and contraceptive use. Marriage is defined as the legalised union of two individuals of opposite sexes and is an important indicator of women's exposure to the risk of pregnancy and higher fertility. Cohabitation, literally means union of two individuals of opposite sexes to take part in human reproduction in which the two individuals lives without any legal binding and thus the union is only consensus. Early age at marriage in a population is usually associated with a longer period of exposure to the risk of pregnancy and consequently higher fertility levels. The onset of menopause marks the end of a woman's reproductive life cycle. Thus, these two factors determine the length and pace of reproduction; hence they are important in understanding fertility levels and differences.

There has been a substantial amount of literature which studied the relationship between marriage and fertility. There is a negative correlation between age at first marriage and cohabitation and TFR (Gupta, P.K.2016). In North-East India age at marriage has a negative effect in transiting to parenthood (Singh, K.A. & Nath, D.C. 2008).

In this paper, we analyse the age pattern of marriage in all the North –East States of India. This is accomplished by computing SMAM and mean and median age at marriage among various socio-economic groups. Preliminary results show that Manipur and Nagaland have higher SMAM than other North –East states. In all the states urban population have higher SMAM than the rural population based on 2011 census data. This indicates that rural population tend to marry earlier than their counterpart. From NFHS report, we conclude that Hindu women have higher SMAM than women of other religious groups (Muslim, Christian, Buddhist, and other) in Arunachal, Assam, Manipur, Meghalaya and Tripura except Mizoram and Nagaland. In these states Christian women have greater SMAM. Manipur has higher mean and median age at marriage as compare to other North-East states. In all the north-east states urban female have higher mean age at marriage.

2. Objectives

This paper will compute for comparing

- The Singulate Mean age at Marriage(SMAM) for all states of North East India.
- SMAM for Women in all religious groups within each state will be compared.

Also, the Mean ages at marriage for all the states and other socio-economic groups will be studied by way of fitting a logistic regression model.

3. Methods and Materials

Definition: The mean age at first marriage is the mean age of men or women at first marriage if subjected throughout their lives to the age-specific marriage rates of first marriages only in a given year. It is derived from the distribution of first marriages by age group of husband or wife.

The singulate mean age at marriage (SMAM) is the average length of single life expressed in years among those who marry before age 50. It is a synthetic indicator calculated from marital status categories of men and women aged 15 to 54 at the census or survey date.

3.1 Computational Steps for SMAM (Hajnal, J. 1953)

Step 1. Calculation of the person years lived in a single state, denoted by A:

$$A = 15 + 5 * \sum_{a=1}^7 S_a$$

where S_a is the proportion single in age group $a = 1, \dots, 7$ (15-19, ..., 45-49)

Step 2. Estimation of the proportion remaining single at age 50, denoted by B:

$$B = (S_{45-49} + S_{50-54})/2$$

If the proportion single in age group 50-54, is not available, then

$$B = S_{45-49}$$

Step 3. Estimation of the proportion ever marrying by age 50, denoted by C:

$$C = 1 - B$$

Step 4. Calculation of the number of person-years lived by the proportion not marrying, denoted by D:

$$D = 50*B$$

Step 5. Calculation of singulate mean age at marriage (SMAM):

$$SMAM = (A - D)/C$$

Data on the population by age group, sex and marital status are generally obtained from censuses or sample surveys that include questions regarding the current marital status, age and sex of persons enumerated. Data derived from censuses are generally preferred because, when obtained through a questionnaire applied to the whole population, they are not affected by sampling variability. However, reporting errors may nevertheless bias the results.

In this paper we use data from census 2011 to compute SMAM for both male and female. The required information on proportion singles are downloaded from the census of India website. However, data on proportion singles through various socio-economic groups are not provided by Census 2011, (www.CensusofIndia.gov.in) So to compute SMAM within women of socio-economic groups we use data from National Family Health Survey (NFHS – 3, 2005-06).

4. Results

The following tables (Table 1 – Table 3) presents SMAM for different states among Male and Females. In Table 4, we present the result of comparing the mean age at marriages among rural and urban women in each state.

The Singulate mean age at marriage computed using the data from census 2011 for eight states of north east are presented in table 1. This also includes urban and rural classification and the male and female classification within each state. Among the eight states Nagaland and Manipur have the highest SMAM value of approximately 27 followed by Mizoram, Sikkim having SMAM value 25 and 24.5 respectively. The state of Arunachal, Assam and Tripura have approximately SMAM 24 years. SMAM for male shows higher than SMAM for female in all the states. In the urban and rural classification it is also seen that urban women have higher SMAM than rural women. And so is the case for male SMAM except Nagaland where rural males have higher SMAM than urban males.

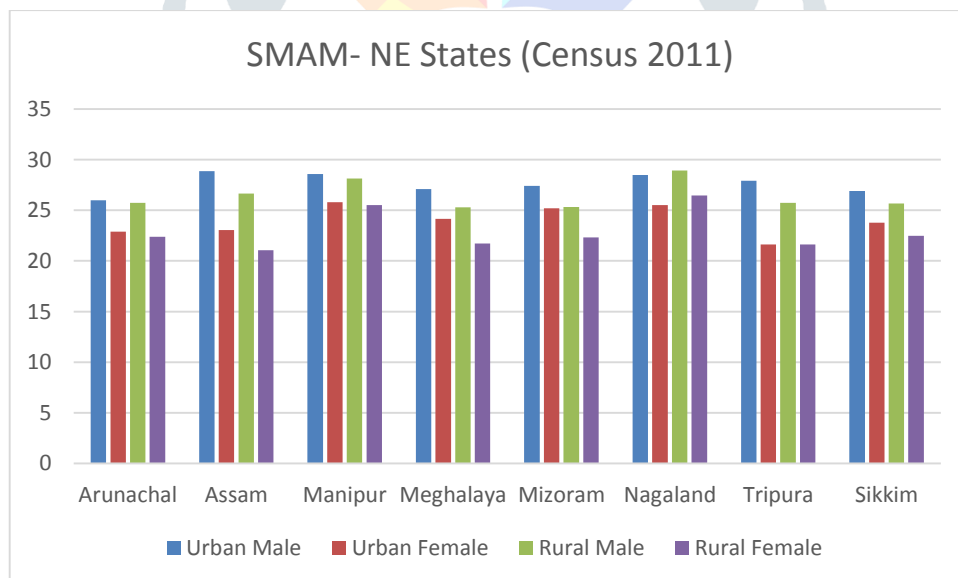
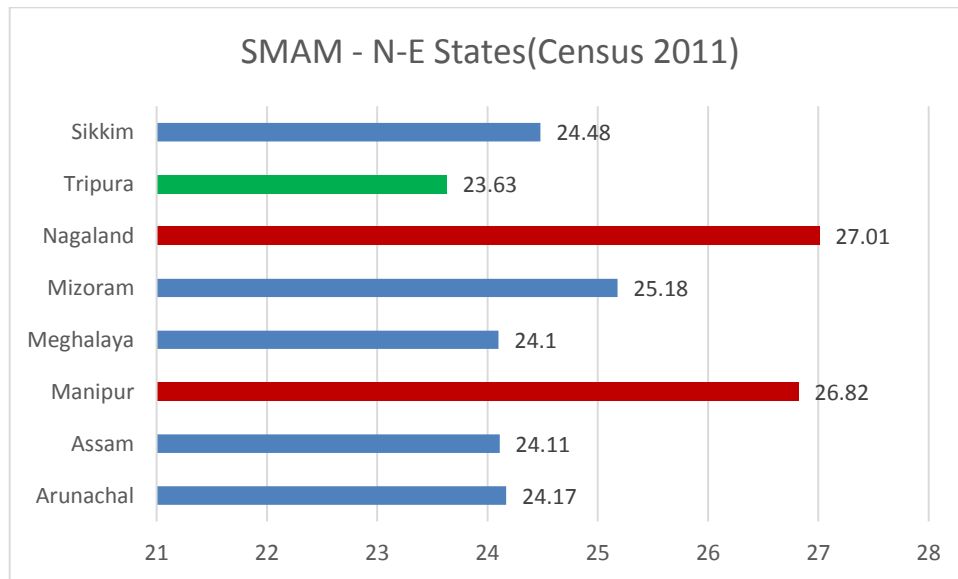
The SMAM for female computed using NFHS-3 data are presented in table 2 along with urban/rural classification. In the table Sikkim was not included as the data for Sikkim is not available. Here also urban women show higher SMAM than their women counterpart. As a whole, the state of Manipur shows the highest female SMAM approximately 25 followed by Meghalaya, Mizoram and Nagaland. There is not much inconsistent results from table 1 and 2 which are computed from two sources of data. It can be concluded from table 1 and 2 that urban women have on an average spend longer single life than rural women. This also indicates that on an average the urban women marry late as compared to rural women.

In the next table we compute SMAM for female among major religious group viz Hindu, Muslim, Christian, Buddhist and others. In the state of Assam, Manipur, Meghalaya and Tripura, Hindu women show higher SMAM as compare to others religious group. However, in the states of Mizoram and Nagaland Christian women have higher SMAM than others religious group. In Arunachal Buddhist women have higher SMAM than others religious groups. In all the states Muslim women tend to have lower value of SMAM.

In Table 4 we compute the mean age at marriage among the female along with the urban rural classification. The last column of table shows p-value for comparing the means using t-test. In the state of Arunachal, Nagaland and Mizoram the p-value are not significant which suggest that the mean age at marriage are not significantly different among urban and rural women. However, in the case of Manipur, Meghalaya, Assam and Tripura the mean age at marriage among urban and rural women are significantly different.

STATE	Whole State			Urban			Rural		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Arunachal	24.17	25.80	22.53	24.49	25.98	22.89	24.06	25.75	22.40
Assam	24.11	26.86	21.36	26.00	28.88	23.06	23.78	26.64	21.07
Manipur	26.82	28.16	25.49	27.16	28.58	25.81	26.83	28.13	25.52
Meghalaya	24.10	22.64	22.39	25.63	27.09	24.16	23.47	25.30	21.73
Mizoram	25.18	26.42	26.43	26.30	27.41	25.21	23.82	25.34	22.32
Nagaland	27.01	28.43	25.53	27.08	28.50	25.53	27.66	28.93	26.46
Tripura	23.63	26.31	20.91	24.75	27.91	21.62	23.24	25.73	21.63
Sikkim	24.48	26.00	22.83	25.40	26.92	23.79	24.15	25.66	22.47

Table 1: Singulate Mean age at Marriage (SMAM) For Eight NE States (Census 2011)



STATE	Whole state	Urban	Rural
Arunachal	21.133	21.26	21.17
Assam	21.67	23.18	21.02
Manipur	24.92	26.02	24.00
Meghalaya	24.06	26.00	22.48
Mizoram	23.58	24.61	22.36
Nagaland	23.70	24.21	23.33
Tripura	20.68	21.01	20.56

Table 2: SMAM-Female For Seven NE States (NFHS-3, 2005-06)

STATE	Hindu	Muslim	Christian	Buddhists	Others
Arunachal	20.57	18.13	21.00	21.45	20.46
Assam	22.71	19.55	17.91	-	-
Manipur	26.05	22.24	23.41	-	24.61
Meghalaya	25.12	22.94	23.98	-	22.88
Mizoram	20.63	-	23.83	19.31	-
Nagaland	22.60	17.97	24.43	-	-
Tripura	20.95	18.45	-	20.42	-

-Not computed due to scanty or Insufficient data

Table 3: SMAM-Females among Major Religious groups for Seven NE States (NFHS-3, 2005-06)

STATE		Mean age at marriage	p-value for t test
Arunachal	Urban	17.69	0.057
	Rural	17.65	
Nagaland	Urban	19.55	0.117
	Rural	19.05	
Manipur	Urban	21.78	0.000
	Rural	20.22	
Mizoram	Urban	20.37	0.963
	Rural	19.79	
Tripura	Urban	18.91	0.000
	Rural	17.53	
Meghalaya	Urban	19.98	0.000
	Rural	18.83	
Assam	Urban	18.93	0.001
	Rural	17.87	

Table 4: Comparison of Age at Marriage among Females (NFHS -3) for rural and urban

4.1 Results of fitting logistic regression

From Table 5(a) through Table 5(g) we present the results of fitting the logistic regression model. In the model we consider the dependent binary variable as follows:

Early marriage: those women who marry before age 18 years and

Late Marriage: those women who marry on or after age 18 years.

Three socio-economic covariates are included in the model. They are: (a) Type of place of residence coded as Rural and Urban of which Urban is taken as the reference category, (b) Religion categorised as Hindu, Muslim and Christian of which Hindu is taken as the reference category and (c) Education of women categorised as Illiterate or low education and Higher education. Wealth is not included in the model as it is mainly reported as the income of the husband's family which is not for the women's parental income.

In each of the table the last column shows the odds ratio(OR) for comparing the risk of marriage at an early age or later age using a reference category as indicated by "Ref" in the first column. The p-values for Wald test are presented in column three of each table.

In Table 5(a) for Arunachal, residence type and religion are not significant. However, Education of women which is highly significant plays the key role in comparing the risk of early marriage. The OR of 3.03 indicates that Women who are illiterate or low educated are at higher risk of early marriage. That is approximately 3 times higher risk of early marriage as compared to women of higher education.

In the state of Assam (Table 5(b)) all covariates are significant. Odds ratio for residence type is 0.83 that indicates that rural women are less likely to marry late as compared to urban women. Odds ratio for Muslim women is 0.40 and that of Christian women is 2.79. It can be interpreted as Muslim women are 40% less likely to marry late whereas Christian women are 2.79 times more likely to marry late as compared to Hindu women.

Variable and Category	Coeff. (B)	P-value for Wald test	O.R.
Residence Type			
Urban (Ref)	-	-	-
Rural	.108	.521	1.114
Religion			
Hindu (Ref)	-	-	-
Muslim	-.418	.290	.658
Christian	-.079	.621	.924
Education			
Illiterate or Low Edn.(Ref)	-	-	-
Higher Edn.	1.110	.000	3.034

Table 5 (a) State: Arunachal Pradesh

In Manipur (Table 5(c)) Rural women are less likely to marry late which is 19% less likely as compared to urban women. Similarly, in Nagaland also, rural women are 24% less likely to marry late. So is the case in the states of Tripura and Sikkim. In Mizoram, p-value is not significant and so we can say that rural women are equally likely to marry early or late.

Muslim women are at higher risk of early marriage as compared to Hindu women in all the states. But for Christian women it is a different scenario. In Manipur, Christian women are at higher risk of early marriage but in Nagaland Christian women are at lower risk of early marriage. In other words, Christian women marry later than Hindu women in Nagaland. For the rest of the states p-value is not significant.

Variable and Category	Coeff. (B)	P-value for Wald test	O.R.
Residence			
Urban (Ref)	-	-	-
Rural	-0.187	.038	0.829
Religion			
Hindu (Ref)	-	-	-
Muslim	-0.913	.000	0.401
Christian	0.773	.000	2.167
Education			
Illiterate or Low Edn.(Ref)	-	-	-
Higher Edn.	1.027	.000	2.793

Table 5 (b) State: Assam

Variable and Category	Coeff. (B)	P-value for Wald test	O.R.
Residence			
Urban (Ref)	-	-	-
Rural	-.207	.062	.813
Religion			
Hindu (Ref)	-	-	-
Muslim	-1.845	.000	.158
Christian	-.673	.000	.510
Education			
Illiterate or Low edn. (Ref.)	-	-	-
Higher Edn.	.817	.000	2.264

Table 5 (c) State: Manipur

Variable and Category	Coeff. (B)	P-value for Wald test	O.R.
Residence			
Urban (Ref)	-	-	-
Rural	-0.270	.005	.763
Religion			
Hindu (Ref)	-	-	-
Muslim	-0.381	.041	.683
Christian	0.791	.000	2.205
Education			
Illiterate or Low edn.	-	-	-
Higher Edn.	0.656	.000	1.928

Table 5 (d) State: Nagaland

Another key finding from the logistic regression model is that women of higher education are more likely to marry late than women in lower or no education. In Manipur, Mizoram, Meghalaya and Nagaland illiterate women are nearly 2.3 times more likely to marry at an early age as compared to educated women. In Arunachal and Assam, the O.R. is nearly 3 which indicates that illiterate women are 3 times more risk of early marriage than educated women. In Tripura O.R. is even higher as 4. That is illiterate women are 4 times more risk of marrying early than educated women.

Variable and Category	Coeff. (B)	P-value for Wald test	O.R.
Residence			
Urban (Ref)	-	-	-
Rural	.070	.624	1.073
Religion			
Hindu (Ref)	-	-	-
Muslim	-.515	.611	0.597
Christian	.177	.684	1.193
Education			
Illiterate or Low edn.	-	-	-
Higher Edn.	.643	.000	1.903

Table 5 (e) State: Mizoram

Variable and Category	Coeff. (B)	P-value for Wald test	O.R.
Residence			
Urban (Ref)	-	-	-
Rural	-0.296	0.031	0.744
Religion			
Hindu (Ref)	-	0.091	-
Muslim	-0.416	0.163	0.660
Christian	0.147	0.358	1.158
Education			
Illiterate or Low edn. (Ref)	-	-	-
Higher Edn.	0.637	0.000	1.890

Table 5 (f) State: Meghalaya

Variable and Category	Coeff. (B)	P-value for Wald test	O.R.
Residence			
Urban (Ref)	-	-	-
Rural	-0.209	.126	0.812
Religion			
Hindu (Ref)	-	-	-
Muslim	0.745	.001	0.475
Christian	1.311	.128	3.708
Education			
Illiterate or Low Edn.(Ref)	-	-	-
Higher Edn.	1.451	.000	4.267

Table 5 (g) State: Tripura

5. Discussion and conclusion

In this paper the main objective is to discuss the age pattern of marriage in the eight states of North-east India. North-East India have a unique socio-cultural and economic structure which is distinct from the mainland Indian states. It is of paramount interest to investigate all demographic characteristics exclusively for the region. The study of the age pattern of marriage is investigated by computing singulate mean age at marriage and Mean age at marriage for all the states and among some of the socio-economic groups within the states. SMAM for urban male or rural male are higher than females as expected. Urban women have higher value of SMAM than rural women which shows that urban women spent longer single lives than their rural counterparts. It is also observed that in almost all the states urban women have higher mean age at first marriage as such rural women are exposed to the risk of pregnancy for a longer period of time. In the reports, of NFHS, the total fertility rates are higher in rural areas than urban areas which could be resulted from early marriages. Therefore, as part of the family welfare programmes of the government of India efforts may be included in order to increase the mean age first marriage in the country in general and in the region in particular. Further, it also evident from the above results that early marriages are very common among Muslim women thereby the TFR is higher in the Muslim women. Though some states of the region show higher mean age at marriage among Christian and Buddhists women, Hindu women tend to have higher mean age at marriage as compared other religious groups. This finding may be combined with the education of women wherein the risk marriage at an early age is higher among illiterate or low educated women in all the states. In other words, Muslim women could be more educated properly in order to effectively control the fertility among the group. Lastly, this paper does not consider some other covariates like the income, occupation, employment status, husband's occupation etc. due to time limitation and in some cases due to lack of proper data. In future, the authors will be continuing to further investigation of the age pattern of marriage in the region by incorporating all relevant data.

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