

## Female Age at Marriage and the Birth Rate In India

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Studies conducted in various parts of India have established an approximate, though not consistent, relationship between female age at marriage and completed family size. In the Mysore study (United Nations, 1961), it was observed that females marrying between the ages of 14 and 17 gave birth to 5.9 children, while those marrying between 18 and 21 years eventually gave birth to only 4.7 children. A study in Calcutta among a middle-class urban population (Poti, Malaker, and Chakravorti 1960) showed that females marrying below age 14 gave birth to 6.3 children, those marrying between 15 and 19 gave birth to 5.1 children, and those marrying between 20 and 24 gave birth to only 3.7 children.

Similar relationships have also been observed in model studies conducted by demographers in different parts of the world. Using a stable population model, Coale and Tye (1961) demonstrated that postponement of marriage can contribute substantially to a reduction in birth rates and population growth. This contribution is potentially greatest in those countries which have high fertility and a low average age at marriage. William Leasure (1963) showed that when the mean age at marriage in Bolivia rose from 22.5 years to 27.2 years, the birth rate declined from 41 to 30, or by about 27%, and that in Turkey,

when the female mean age at marriage rose from 19.7 to 27.2 years, the birth rate declined from 50 to 33, or by about 34%.

In studies on the Indian birth rate, it has been estimated that when the female age at marriage is raised to nineteen or twenty years, the birth-rate reduction ranges from 16% to 50% (Agarwala, 1964, 1965). Basavarajappa and Belvalgidad (1967) observed that the decline in the birth rate would not be more than 10% by increasing the minimum age at marriage to nineteen to twenty years in India. Their findings have been criticized by Talwar (1967) who commented that their approach seemed to involve many questionable assumptions.

On the other hand, several studies conducted in India and elsewhere (Sinha, 1952) gave no evidence of any consistent relationship between age at marriage and completed family size. This may be due to differences in marriage cohorts associated with different socioeconomic, cultural, and ethnic characteristics.

Here an attempt has been made to study the effect of female age at marriage on the birth rate by considering a fixed marital fertility schedule for Indian females, unchanging over time irrespective of the marriage habits of the population. The object is to answer the simple question: If the marital fertility schedule continues to operate in its present form but female age at

marriage is increased, what will be the effect on population growth?

The effect on fertility of increasing the age at marriage of Indian women has been considered for four different values of mean age at marriage, namely, 15, 17, 19, and 21 years. The age at marriage of females for rural and urban India by states (Government of India, 1961) was critically examined by applying Hajnal's method (1953) over the marital distribution of females for all India. Table 1 gives those

TABLE 1  
FOUR PATTERNS OF FEMALE MEAN AGE AT MARRIAGE IN INDIA BY LOCATION

MEAN AGE AT MARRIAGE	LOCATION*
I. 14.8	Andhra Pradesh (R), West Bengal (R), Maharashtra (R)
II. 16.8	Gujrat (R), Orissa (R), United Province (R)
III. 18.9	Assam (U), Madras (U), Punjab (U), West Bengal (U)
IV. 21.0	Kerala (U)

\* R = rural; U = urban.

Indian states where the female mean age at marriage corresponds most closely to 15, 17, 19, and 21 and designates them Patterns I-IV.

The averages of percentages of unmarried females for the states detailed in Table 1 have been considered and the mean ages at marriage derived therefrom. The states included in each pattern resemble one another closely in the marital distribution of females. The percentage of unmarried women in each five-year age group for each "pattern" is presented in Table 2. By considering averages of several states, bias in reporting marital status may be assumed to be minimized. The four patterns listed in Table 2 show an association between increasing age at marriage with a relatively higher percentage of single women in all

TABLE 2  
PERCENTAGE OF UNMARRIED WOMEN BY FIVE-YEAR AGE GROUPS IN PATTERNS I-IV

AGE GROUP	PERCENTAGE OF UNMARRIED WOMEN			
	I	II	III	IV
10-15	77.1	91.7	97.3	99.0
15-20	16.6	37.1	57.8	74.5
20-25	2.4	6.1	16.9	29.6
25-30	0.9	1.9	5.6	13.2
30-35	0.6	1.1	3.3	6.5
35-40	0.4	0.8	1.4	4.7
40-45	0.4	0.6	1.2	4.4
45-50	0.3	0.5	0.9	3.4

\* See Table 1 and text for explanation of Patterns I-IV.

age groups. Moreover, the pattern associated with the highest age at marriage exhibits an unusually high percentage of ultimate spinsters.

Regarding measures of fertility, three indices have been considered: (a) the crude birth rate (CBR); (b) the net reproduction rate assuming all marriages to be taking place at the singular mean age at marriage (NRR<sub>1</sub>); and (c) the net reproduction rate using nuptiality tables (NRR<sub>2</sub>). Finally, a simple index, the total fertility rate (TFR), has been calculated.

*Crude birth rate (CBR):* To ascertain the effect of increasing age at marriage on the CBR, the age-specific marital fertility rates were taken from *Vital Statistics of India, 1961* (Government of India, 1963). The averages of percentages of married females for different states included under a particular age-at-marriage pattern were taken as representative. The above percentages were applied to the all India female age distribution in 1961 to arrive at the adjusted number of married females by five-year age groups. The crude birth rates were then obtained as presented in Table 3.

From the above calculations it was observed that when the mean age at marriage changes from 15 to 17 years there is practically no change in the CBR. If the mean age at marriage increases to 19 years, the

TABLE 3  
CALCULATION OF CRUDE BIRTH RATES (CBR) FOR PATTERNS I-IV\*

AGE GROUP	ADJUSTED No. of MARRIED WOMEN (in 00's)				AGE SPECIFIC MARITAL FERTILITY RATE†
	I	II	III	IV	
15-20 .....	169,492	129,610	86,768	59,743	154.3
20-25 .....	174,918	170,324	150,839	122,747	305.0
25-30 .....	155,991	158,777	152,487	133,435	314.2
30-35 .....	129,888	136,047	132,282	120,228	252.2
35-40 .....	100,774	107,220	106,505	95,550	168.1
40-45 .....	72,758	81,758	80,168	70,835	76.3
CBR .....	41.87	41.16	37.58	31.71	...

\* See Table 1 and text for explanation of Patterns I-IV.  
† Per thousand.

CBR declines from 41.87 to 37.58, or by about 11.4%. An increase in age at marriage to 21 years causes the CBR to decline from 41.87 to 31.71, or by about 25%. The above findings are quite consistent with those of Leasure (1963).

*Net reproduction rate assuming all marriages at the singulate mean age at marriage (NRR<sub>1</sub>):* The following results are based on a calculation which assumes (a) all females marry at the singulate mean age; (b) all marriages are first female marriages and remarriages are assumed negligible; (c) mortality rate is independent of marital status; (d) the age difference at marriage between males and females is 5 years; (e) the sex ratio at birth is 0.4878.

The marital fertility rate for the age interval 17-20 has been estimated linearly from those of the age intervals 15-20 and 20-25, assuming any rate for an interval to correspond approximately to the midvalue of the interval. The net reproduction rates corresponding to the four mean ages at marriage of 15, 17, 19, and 21 years have been calculated and are presented in Table 4.

Thus, with an increase in age at marriage of 2, 4, and 6 years, the reductions in the net reproduction rate are 3.3%, 8.7%, and

TABLE 4  
NET REPRODUCTION RATE (NRR<sub>1</sub>) BY AGE AT MARRIAGE\*

Age	NRR <sub>1</sub>
15 .....	1.84
17 .....	1.78
19 .....	1.68
21 .....	1.53

\* Assuming all females marry at singulate mean age at marriage for each pattern.

16.8%, respectively. The above figures are comparable to the results obtained earlier.

*Net reproduction rates using nuptiality tables (NRR<sub>2</sub>):* From a cohort of 100,000 females, the net nuptiality tables corresponding to the four different marriage patterns enumerated earlier have been constructed (Malaker, 1970, 1971). Thus, the number of female marriages within each five-year age group have been obtained. Assuming marriages to be distributed uniformly throughout the year of age ( $x$ ,  $x+5$ ), the average age at marriage may be taken as  $x+2.5$ . Table 5 shows a section of the net nuptiality tables corresponding to the four different marriage patterns. The net reproduction rates corresponding to the four marriage patterns have been calculated and are given in Table 6.

Compared to those in Table 4, these

TABLE 5  
NET NUPTUALITY TABLES FOR PATTERNS I-IV\*

AGE	NO. OF MARRIAGES IN NET NUPTUALITY TABLES			
	I	II	III	IV
10	61,504	37,671	19,536	6,019
15	32,409	43,853	44,698	42,113
20	4,070	14,438	27,024	32,858
25	1,097	2,488	4,488	9,519
30	293	570	1,752	3,750
35	177	288	930	716
40	63	59	114	295

\* See Table 1 and text for explanation of Patterns I-IV.

TABLE 6

NET REPRODUCTION RATE (NRR<sub>0</sub>) BY AGE AT  
MARRIAGE BASED ON NUPTUALITY TABLES

Age	NRR <sub>0</sub>
15	1.79
17	1.73
19	1.63
21	1.48

figures are lower by about five points. This is partly due to the fact that all females do not get married. The figures in Table 6, however, are more representative of the actual situation and are quite consistent with the results obtained in previous sections. According to the above calculations, an increase in age at marriage of 2, 4, and 6 years would result in percentage reductions in reproduction rates of 3.5%, 8.9%, and 17.3%, respectively.

**Total fertility rate (TFR):** Here an alternative approach to the measurement of the effect of increasing age at marriage on population growth is considered. To study the effect of increasing age at marriage on the total number of children ever born, an approximate measure of the completed family size, the ideal method is to trace a cohort of married women marrying at a particular age  $x$  and subjected to a constant marital fertility schedule with no mortality. Any difference observed in such indices may be ascribable to differences in age at marriage. Symbolically, if  $f_x$  is the

age-specific marital fertility rate for the age interval  $(x, x + 1)$  and  $y$  is the age at marriage, assumed to be integral, such an index for a female marrying at age  $y$  may be taken as

$$TFR(y) = \sum_{x=y}^{44} f_x$$

Assuming all females marry at 15, 17, 19, or 21, TFR values have been calculated and are presented in Table 7.

TABLE 7

TOTAL FERTILITY RATE BY AGE AT MARRIAGE

Age	TFR
15	6.35
17	6.04
19	5.73
21	5.27

From Table 7 it can be observed that when the mean age at marriage changes from 15 to 17 years, the TFR declines from 6.35 to 6.04, or by about 5%. When it increases to 19 years, the TFR declines from 6.35 to 5.73, or by about 10%. With an increase in age at marriage to 21 years, the TFR declines by 17%.

## SUMMARY

The study of the effect of increasing age at marriage on fertility reveals a consistent relationship between the two variables. Different measures of fertility have been considered, and it should be noted that numerically they need not give identical results. The percentage reductions in the CBR are larger compared to other measures, particularly for postponement of marriage for a longer number of years. However, a close correspondence between the different fertility indices and the corresponding percentage reduction strengthens the basis of our analysis.

Thus, for an increase in age at marriage of 2 years from 15 to 17, the CBR reduc-

tion seems to be insignificant. A similar result is obtained with other measures of fertility. It appears there is a critical level below which postponement of marriage will not reduce the fertility index (Das, 1965) to a significant extent. However, if the mean age at marriage changes from 15 to 19 years, the CBR falls by 11%, the NRR by 9%, and the TFR by 10%, approximately. With an increase in mean age at

marriage of 6 years, from 15 to 21, the corresponding fertility reductions are 24%, 17%, and 17%, respectively. As observed by Talwar (1967), our study also reveals a larger percentage reduction of fertility, approximately on the order of 20%, when age at marriage increases from 15 to 21 years. These results are at variance with those obtained by Basavarajappa and Belvalgidad (1967).

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