

Demographic Study of Gujjars of Delhi II. Reproductive Profile and Mortality Levels

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ABSTRACT Fertility is a major counteracting force to population attrition from mortality and therefore, has a significant impact as an expansionary force in population dynamics. While mortality, on the other hand, checks the unlimited growth of population and regulates the distribution of individuals in different age groups. It is well known that increasing birth rates cause exposure to several social problems like crisis of minimum needs for survival and subsistence which includes scarcity of food and land, poverty, unemployment, illiteracy, etc. Information on fertility and mortality is relevant both to demographic assessment of the population and to assessment of health policies and programmes. Keeping this in mind, the present study was conducted among Hindu Gujjars of Delhi. The data for present study was collected by interviewing ever-married Gujar women aged 15-49 years from a sample of 558 households. Fertility among Gujjars is higher than all Delhi population. Gujar women are by and large reproductively active during prime childbearing ages of 20-29 years. Gujar women tend to marry early and there is still a fair amount of fertility at very younger ages. Majority of pregnancies resulted in live births. For over three children born, around ninety percent are surviving. Infant and child mortality is relatively higher in groups where fertility is higher. The mean duration of postpartum amenorrhoea is 4.9 months. Mean age at menarche is 13.99 years while mean menopausal age is 44.06 years. Though IMR is lower among Gujjars, but overall mortality (CDR) is slightly higher than all Delhi population with respiratory disorder being the primary cause of death.

INTRODUCTION

Human fertility is responsible for the biological replacement and maintenance of the human species. In fact, the fertility is a major counteracting force to population attrition from mortality and therefore, has a significant impact as an expansionary force in population dynamics. Fertility may be defined as the actual reproductive performance of a woman or a group of women (Thompson and Lewis, 1965). However, the phase of actual reproductive performance is contented in terms of the physiological potential of a woman to conceive and bear children. This phase is termed as the fecund period, which has two extremes, viz., menarche and menopause. In demographic studies, the reproductive span i.e., the child bearing period of women is usually taken to as between 15 to 49 years of age. Thus, a fecund woman may or may not be fertile but a fertile woman must be fecund. The main events or phenomenon associated with fertility are age at menarche, age at marriage and age at menopause.

There is a wide variation in menarcheal age (I.C.M.R., 1972; Pawson, 1976; Malik and Hauspie, 1986). Many factors including genetic,

nutrition and socioeconomic conditions influence age at menarche (Eveleth and Tanner, 1976; Bhasin, V., 1990; Bhasin and Nag, 2002a). Genetics perhaps sets the boundaries, but environment dictates how one falls within these limits. Similarly, Menopause is influenced by nutrition, genetics, socioeconomic conditions, climate, smoking habit, drugs and contraceptives (ICMR, 1998; Frisch and McArthur, 1974; Beall, 1983). The relationship between age at marriage and fertility is well known (Maudlin and Berelson, 1978; Nag, 1982; Pandey and Talwar, 1987). As age at cohabitation (i.e., age at consummation of marriage) determines the reproductive life span of a woman and has a direct bearing on fertility, it is one of the important aspects with regards to fertility (Maudlin and Berelson, 1978; Nag, 1982; Chaudhury, 1984). It is found that a later age at marriage reduces fertility (Agarwala, 1967; Durch, 1980; Yadav and Badari, 1997). Educational level, economic status, religious attitudes, women's work participation, etc are other factors, affecting fertility (RGI-fertility survey, 1971; Basu et al., 1988; Bhasin, V., 1990; Elamin and Bhuyan, 1999, Pandey et al., 2000; Bhasin and Nag, 2002b), in addition to, conception control practices and attitudes, (Bhuyan and Ahmed, 1984).

The most striking demographic event in the past few decades has been the unprecedented

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increase in the population, particularly in the developing countries, such as India, primarily due to the remarkable fall in mortality. There can be little doubt that the massive investments in health, sanitation, water supply, and other associated sectors have directly contributed to decline in the mortality rates (Preston, 1978; Kshatriya et al, 1997; Verma, 2002). The study of mortality is useful for analyzing current demographic conditions as well as for determining the prospects of potential changes in mortality condition of the future. The study of infant mortality is significant, especially because mortality during the first year of life is invariably high for all countries, irrespective of whether the overall levels of mortality are high or low. Infant mortality rate is not only a reliable indicator of health status and well being of the children but it is also an indicator of socio-economic development of the population. In India, low birth weight is one of the major causes for infant mortality as this increases the susceptibility to infections. Diarrhoea and Acute respiratory infections particularly pneumonia are the other major causes (RGI, 1997; NIHFW report 1999-2000).

The present paper is second in the series of research articles dealing with various aspects of Gujjars of Delhi. In the paper, an attempt has been made to assess fertility of Hindu Gujjars of Delhi. It aims at estimating various fertility measures besides evaluating the reproductive profiles of Gujjar women, including age at menarche, age at menopause and duration of postpartum amenorrhea, along with the estimation of various mortality rates.

MATERIAL AND METHODS

The present study was conducted among Hindu Gujjars residing in Delhi. Five Gujjar predominated villages selected at random, were visited during different months of the year 2002. The data was collected from ever-married Gujjar women aged 15-49 years from a sample of 558 households using interview schedule. The Interview Schedule consisted questions on household identification, ego's name, age, etc., besides questions related to reproductive profile. The Household Schedule was also used to collect information on all the live births and deaths that took place within the last one year in the household. (For details see Dabral and Malik,

2004a) The data collected was statistically treated, using descriptive statistics. In some cases age could not be appropriately assessed due to misstatement of age especially by older women who tend to understate their true ages. There are chances of underreporting in some cases about data on reproductive wastage.

The age-wise distribution of the respondents is shown in Table 1. A look at the general characteristics of the respondents reflects that nearly all the respondents are currently married (97.1 percent) while, the remaining females are widowed. No woman is either divorced or separated. About one-third of the respondents are illiterate while only about one-ninth have completed high school. A small proportion of women are graduate and above. Analysis of work status of the respondents reflects that almost cent percent are not working and are engaged in household activities that includes expanded domestic work like preparation of cow dung cakes, etc. All these reflect the present overall status of Gujjar women in Delhi.

RESULTS AND DISCUSSION

Current Fertility Levels: The evaluation of fertility levels in Gujjars on the basis of measures like Crude Birth Rate (CBR), General Fertility

Table 1: Distribution of ever-married women aged 15-49 years, by age

Age groups (in years)	Number	Percent
15-19	27	4.8
20-24	113	20.3
25-29	132	23.7
30-34	122	21.9
35-39	80	14.3
40-44	41	7.3
45-49	43	7.7
Total	558	100.0

Rate (GFR), Age Specific Fertility Rate (ASFR) and Total Fertility Rate (TFR), calculated for 'past one year', are presented here. A look at the current fertility levels indicates that CBR for Gujjars of Delhi is 19.30 births per 1,000 individuals. It is higher than all Delhi crude birth rate for year 2002 (17.2: SRS, 2003), but lower than that of all India (25.0: SRS, 2003). GFR is estimated at 66.44 births per 1000 women. The value for TFR is obtained as 1.76 births per woman while Gross Reproduction Rate (GRR)

that suggests how effectively mothers are replacing themselves with daughters who would bear the next generation is 0.83 female births per woman for Gujjars. The estimates of ASFRs show that majority of total fertility is concentrated in the prime childbearing ages of 20-29 years (Fig. 1). The fertility rate declines substantially in the next age group 30-34 years. Among Gujjar women, early childbearing (at the age of 15-19 years) and child bearing at the age of 30 years and above is quite low, during one year preceding the study.

Age at First marriage and Cohabitation: In the present study age at first marriage refers to age at formal marriage. In Gujjars, the formal marriage is not always immediately followed by cohabitation particularly if marriage occurs at a

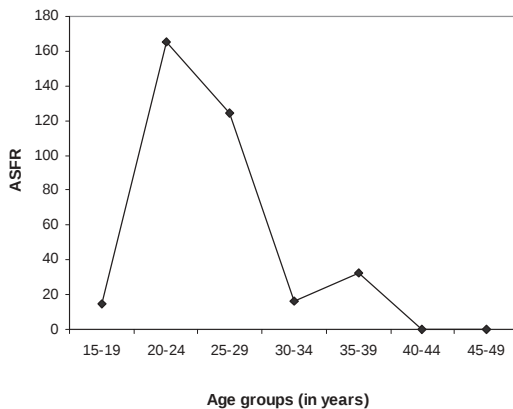


Fig. 1. Age-specific fertility rates (during one year period prior to the study)

very young age. Rather, cohabitation typically begins only after the 'Gauna' ceremony. The study of patterns of age at first marriage indicates that more than three-fourth of the women got married between 15-19 years of age while proportion marrying before 15 years of age and after 20 years of age is low (Table 2A). It is

Table 2A: Percent distribution of ever-married women aged 15-49 years, by age at first marriage

Age at marriage	Number	Percent
10-14	59	10.57
15-19	434	77.78
20-24	63	11.29
>24	2	0.36
Total	558	100.00

observed that three-fifth of the women got married before reaching 18 years of age (Table 2B). The median age at first marriage for women aged 15-49 years is 17 years (mean 17.05 years).

Age at cohabitation (considered in the study as, age at consummation of marriage/ age at effective marriage) is relevant for fertility studies as it determines the reproductively active period of a woman and has a direct bearing on fertility. More than four-fifth of the women, started cohabiting with their husband between 15-19 years of age (Table 3A). It is observed that more than half of the women started cohabitation between 18-20 years of age (Table 3B).

The median age at first cohabitation with husband is 18 years (mean 17.82 years) for women aged 15-49 years indicating a median gap of 12 months between age at marriage and age at cohabitation. The mean age at effective marriage for females among Gujjars is 17.82 years which is lower than the mean age at effective marriage for females 15 years and above (19.3: SRS, 1999) and slightly below the legal permissible age. This may be due to lower

Table 2B: Percent distribution of ever-married women aged 15-49 years, by age at first marriage

Age at marriage	Number	Percent
<18	341	61.11
18-20	189	33.87
>20	28	5.02
Total	558	100.00

Table 3A: Percent distribution of ever-married women aged 15-49 years, by age at cohabitation

Age at cohabitation	Number	Percent
10-14	12	2.15
15-19	481	86.20
20-24	63	11.29
>24	2	0.36
Total	558	100.00

Table 3B: Percent distribution of ever-married women aged 15-49 years, by age at cohabitation

Age at cohabitation	Number	Percent
<18	219	39.25
18-20	311	55.73
>20	28	5.02
Total	558	100.00

women's status besides parent's education and attitude among Gujjars; as parent's education, religion, family type, age at menarche, female education, are some of the factors associated with female age at marriage (Srivastava, 1984; Rao and Surender, 1998).

Reproductive Wastage: Reproductive wastage includes still births, spontaneous and induced abortions. Of the 2023 pregnancies reported by sampled women only small proportion of abortions and still births were reported (Table 4).

There is relatively little variation in the outcome of pregnancies by age except for the age group 15-20 years, where the combined percentage of abortions and stillbirths is relatively high, which is in acceptance to the findings that risk of pregnancy, besides older mother, is highest at young child bearing ages, as younger mothers i.e., below 20 years, are not physiologically completely prepared for the

process of reproduction (Montagu, 1963). There were 3.2 induced abortions and 3.5 stillbirths for every 100 live births among Gujjars of Delhi. Majority of pregnancies resulted in live births (85.5 percent) as compared to reproductive loss. **Number of Children Ever-born and Living:** The number of children a woman has ever born, is a cohort measure of fertility as compared to period measure of fertility like crude birth rate, age specific fertility rate, etc. as it reflects the experience of groups of women over a number of years rather than a specific calendar year (Weeks, 2002). The interaction of maternal age and parity (i.e. birth order) is of interest as younger mother are at risk of pregnancy wastage and babies of older mother are at risk of congenital malformations. Also, the frequency of mortality increases considerably with higher order of birth. Ever-married Gujjar women in the childbearing years have borne an average of 3.34 children and have 3.10 currently living i.e., for over three children born around ninety percent are surviving (Table 5).

The mean number of children ever born increases steadily with age, reaching a high of over five children per woman for the 45-49 age group. More than one-fifth of the women in the age group of 15-19 years have ever had a child reflecting the past pattern of relatively early marriage and teenage childbearing. The distribution of women aged 45-49 years by number of children ever born is important because these women have nearly completed their childbearing. Thus, the distribution of ever born represents the completed parity distribution for this cohort of women. Results indicate that women who were born before 1960s have higher

Table 4: Percent distribution of all pregnancies of ever-married women aged 15-49 years, by pregnancy outcome and age of women

Age (in years)	Spontaneous abortions	Induced abortions	Still-births	Live births	Total per-cent	Number of pregnancies
15-19	22.2	11.1	-	66.7	100.0	9
20-24	8.9	4.2	0.5	86.3	100.0	190
25-29	9.5	4.0	3.8	82.7	100.0	451
30-34	10.0	2.0	2.9	85.2	100.0	512
35-39	6.4	2.2	2.8	88.6	100.0	361
40-44	8.4	1.0	2.0	88.7	100.0	203
45-49	8.4	3.0	4.4	84.2	100.0	297
Total	8.8	2.8	3.0	85.5	100.0	2023

Table 5: Percent distribution of ever-married women aged 15-49 years, by number of children ever born and mean number of children ever born and living, according to age

Age (in years)	Children ever born									Total percent	Number of women	Mean CEB*	Mean children living
	0	1	2	3	4	5	6	7	8+				
15-19	77.8	22.2	-	-	-	-	-	-	-	100.0	27	1.0	0.8
20-24	15.9	35.4	38.1	8.8	1.8	-	-	-	-	100.0	113	1.7	1.6
25-29	1.5	2.3	31.8	45.5	15.9	2.3	-	0.8	-	100.0	132	2.9	2.7
30-34	-	3.3	11.5	35.2	31.1	13.9	4.1	-	0.8	100.0	122	3.6	3.4
35-39	-	-	8.8	33.8	31.3	7.5	13.8	3.8	1.3	100.0	80	4.0	3.7
40-44	-	-	4.9	22.0	29.3	26.8	7.3	9.8	-	100.0	41	4.4	4.0
45-49	-	-	2.3	2.3	16.3	18.6	25.6	20.9	14.0	100.0	43	5.8	5.3
Total	7.3	9.5	19.5	26.9	18.8	8.1	5.4	3.0	1.4	100.0	558	3.34	3.10
S.D	-	-	-	-	-	-	-	-	-	-	-	1.58	1.42

* CEB refers to children ever born

fertility than the younger women. It is to be recalled that no births have occurred in this age group during the last one year. One-fourth of the women are at parity six which is higher than the mean number of children ever born of over five (Table 5). Nil childlessness in the older age groups suggests the absence of primary infertility among Gujjars of Delhi. For all the women aged 15-49 years the average number of children who died is 0.24 per women. Overall, infant and child mortality is relatively high in groups where fertility is high.

Age of Mothers at First and Last Birth: The onset and cessation of childbearing is important demographic indicator of fertility. Early births are not uncommon for ever married Gujjar women in the age group 15-19 years (Table 6). More than one-fifth of women aged 15-19 years have given birth to children indicating teenage childbearing. Over half of the women in the age group 45-49 years have had their first childbirth before the age of 20 years, while the corresponding proportion of such women in the age group 20-24 years is two-fifth indicating decline in early childbearing (before the age of 20 years) during last two and half decades. The median age at first birth is marginally higher for younger women. Overall, the median age at first birth is 19 years (mean 19.59 years) for Gujjar women aged 15-49 years indicating relatively early marriage and childbearing.

The age at last childbirth (for women aged 40-49 years) is an important demographic

determinant of fertility. It is suggestive that childbearing is virtually complete by these ages. Four-fifth of the women had completed their childbearing by age 30 in the age group 40-44 years with median age at 26 years (Table 7).

The childbearing was completed by 30 years of age, for more than half women in age group 45-49 years, with 29 years as median age at last childbirth. No one reported having a birth after age 39 years indicating that generally childbearing is complete by this age. Generally speaking, Gujjar women are reproductively active during prime childbearing ages of 19 to 29 years.

Postpartum Amenorrhoea: The duration of postpartum amenorrhoea following a birth is closely associated with the duration of breastfeeding, which tends to suppress resumption of ovulation (Huffman et al., 1987; Srinivasan et al., 1989; Babu, 1996). Thus, lactational amenorrhoea or the postpartum amenorrhoea is one of the factors that influence the risk of pregnancy following a birth. Over 90 percent of the women, based on cross-sectional data, who had a birth in the three months period prior to the study were amenorrhoeic while more than two-third of women whose last birth occurred 4-5 months prior to the study, were amenorrhoeic mother (Table 8). The proportion of amenorrhoeic mothers gradually decreases as the number of months since birth increases. The proportion of women still amenorrhoeic at 8-9 months since birth is about one-fourth. The

Table 6: Percent distribution of ever married women aged 15-49 years, by age at first child birth and age

Mother's age (in years)	No birth	Age at first birth					Total		Median age at first birth
		<18	18-19	20-21	22-24	25+	Percent	Num- ber	
15-19	77.8	14.8	7.4	-	-	-	100.0	27	NC*
20-24	15.9	3.5	36.3	34.5	9.7	-	100.0	113	19.5
25-29	1.5	9.1	36.4	35.6	16.7	0.8	100.0	132	19.5
30-34	-	13.1	45.1	27.9	11.5	2.5	100.0	122	19.0
35-39	-	17.5	41.3	25.0	8.8	7.5	100.0	80	19.0
40-44	-	2.4	43.9	26.8	22.0	4.9	100.0	41	20.0
45-49	-	30.2	23.3	18.6	25.6	2.3	100.0	43	19.0

NC* Not calculated because less than 50 percent of women have had a first child birth

Table 7: Percent distribution of ever married women aged 40-49 years, by age at last child birth and age

Mother's age (in years)	Age at last birth					Total		Median age at last birth
	< 25	25-29	30-34	35-39	40+	Percent	Number	
40-44	22.0	58.5	14.6	4.9	-	100.0	41	26
45-49	7.0	48.8	37.2	7.0	-	100.0	43	29

median and mean duration of postpartum amenorrhoea are 4.5 and 4.9 months respectively, indicating that Gujjar women remain insusceptible to pregnancy for over 4 months after birth due to the effect of postpartum amenorrhoea. Breastfeeding is the major determinant of prolonged postpartum amenorrhoea, the birth interval and the resumption of next menses, in societies where it is universal (like in the present Gujjar population), prolonged and of high intensity (Singh and Negi, 1985; Srinivasan et al., 1989; Babu, 1996). However, duration of postpartum amenorrhoea varies from women to women (Knodel and Lewis, 1984; Jones, 1988).

Age at Menarche and Menopause: Menarche is the primary indicator of onset of sexual maturation in a female which affects her reproductive life. Age at menarche is varied as it being physiological phenomenon is affected by interaction between different factors such as genetic, nutrition, and socio-economic status (Eveleth and Tanner, 1976). Earlier, in India, age at menarche in many societies also determined age at marriage, as girls were married before or immediately after the attainment of menarche (Mandelbaum, 1974). Early menarche and late menopause gives greater reproductive span than vice-versa situation, therefore, higher fertility is expected in such cases. Among Gujjars, menarche is relatively uncommon before 13 years of age (Table 9). Menarcheal age for ever-married women ranges between 11 and 18 years. The median age at menarche is 14.0 years (mean age at menarche is 13.99 years). The mean menarcheal age is almost same as that for rural Indian population (mean 14.04 years: ICMR, 1972).

Another factor limiting fertility is the onset

Table 8: Percentage of babies born during the past one year whose mothers are postpartum amenorrhoeic, by number of months since birth

Months since birth	Total number of births	Babies whose mothers are postpartum amenorrhoeic	
		Percent	Number
0 - 3	12	91.7	11
4 - 5	10	70.0	7
6 - 7	14	50.0	7
8 - 9	18	27.8	5
10 - 11	14	-	-
Total	68	44.1	30

of menopause (women who are pregnant or postpartum amenorrhoeic are considered not to be menopausal). After 30 years of age, the risk of pregnancy begins to decline with age, as an increasing proportion of women become infertile. Menopause is relatively infrequent before the age of 42 years and after 46 years (Table 10).

Menopausal age for ever-married women ranges between 41 and 48 years, while the mean menopausal age is 44.06 years (median age : 44 years). Like age at menarche, age at menopause too is affected by factors like nutrition, genetic, socio-economic status, environmental conditions, etc (Frisch and McArthur, 1974; Beall, 1983; ICMR, 1998).

Current Mortality Rates: Mortality rates of Gujjars in past one year estimated on the basis of Crude Death Rate (CDR), Infant Mortality Rate (IMR) and Cause Specific Death Rate (CSDR) are presented here. Such information is relevant both to demographic assessment of the population and to health policies and programmes. Mortality checks the unlimited growth of population and regulates the distribution of individuals in different age groups. It is a continuous force of attrition tending to reduce population but having its effect

Table 9: Percent distribution of ever-married women aged 15-49 years, by age at menarche

Age at menarche	Frequency	
	Number	Percent
<11	0	0.0
11-12	30	5.4
13-14	357	64.0
15-16	169	30.3
17-18	2	0.4
Total	558	100.0

Table 10: Percent distribution of ever-married women aged 15-49 years, who are menopausal, by age at menopause

Age at menopause	Frequency	
	Number	Percent
< 40	0	0.0
41 - 42	9	17.0
43 - 44	25	47.2
45 - 46	14	26.4
47 - 48	5	9.4
Total	53	100.0

counteracted by the force of fertility. In effective reduction of mortality level, infant mortality has a key role to play.

Crude Death Rate for Gujjars of Delhi is 5.96 per 1,000 population which is slightly higher than all Delhi crude death rate for year 2002 (5.1: SRS, 2003) but lower than that of all India (8.1: SRS, 2003). The infant mortality rate is used internationally as a reliable indicator of health of children and level of development of socio-economic status and quality of life. Among Gujjars infant mortality rate (29.41 per 1000 live births) is not only lower than that for all Delhi population (32.0: SRS, 2003), but much lower than that for all India (64.0: SRS, 2003). This is probably due to better standard of living, hygiene condition, access to health facilities, and improving educational levels.

Evaluation of death rates by cause of death indicates that respiratory disorders such as T.B., pneumonia are the major cause of death among Gujjars (Table 11). Cause specific death rate due to respiratory disorders is 1.70 deaths per 1000 population. Death rates due to other causes such as fever, accidents, diseases of circulatory system and digestive disorders are in varying proportion with digestive disorders being the least common cause of death.

In India, significant proportion of deaths occur during 0-4 years (32.7%) and old age (60 years and above, 35.5%: RGI, 1995). Though during the last 50 years IMR of India has come down by more than 50%, but it is still very high as compared with the developed countries of the world like USA, UK, Japan and France. As mentioned earlier among Gujjars, infant and child mortality is relatively higher in groups where fertility is higher. This supports the argument that increased mortality is response to high fertility (Chen et al., 1974; Choudhury et al., 1976). Another relationship is also well

recognized i.e., high fertility is a biological and behavioural response to high mortality (Preston, 1978). In single terms higher infant mortality tends to higher fertility and vice-a-versa.

CONCLUSIONS

From the foregoing discussion, it may be concluded that in general, the egos are currently married, less educated and engaged in household activities. Fertility among Gujjars is higher than all Delhi population as indicated by period and cohort measures of fertility as well as by lower mean age at effective marriage for females. Gujar women are by and large reproductively active during prime childbearing ages of 20-29 years. Gujar women tend to marry early and there is still a fair amount of fertility at very younger ages. Older women are more likely than younger women to have married at an early age. Majority of pregnancies resulted in live births. For over three children born, around ninety percent are surviving. Infant and child mortality is relatively higher in groups where fertility is higher, reflecting a well recognized fertility-mortality relationship. The mean duration of postpartum amenorrhoea is 4.9 months. Mean age at menarche is 13.99 years while mean menopausal age is 44.06 years. Though IMR is lower among Gujjars, but overall mortality (CDR) is slightly higher than all Delhi population with respiratory disorder being the primary cause of death.

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Table 11: Cause specific death rates (during the one-year period prior to the study)

Cause of death	Number of deaths	Cause specific deaths rates
Accidents and injuries	3	0.85
Fever	5	1.42
Coughs (disorder of respiratory system)	6	1.70
Diseases of circulatory sys.	5	1.42
Digestive disorders	2	0.57
Total	21	5.96

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