

Demography of the Tribal Groups of Rajasthan: 6. Regression Analyses

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ABSTRACT Statistical tools mainly multiple regression have been utilised to study the impact of various ecological, biological and socio-economic variables on fertility, mortality and usage of family planning methods and various tribal groups of Rajasthan. Various variables show important bearing on the livebirths, infant mortality and usage of family planning methods.

INTRODUCTION

A variety of variables have important bearing on fertility, infant and child mortality and usage of family planning methods. In fact, variation in fertility levels, infant and child mortality levels and usage level of family planning methods in the present Scheduled Tribe population on the whole, and also among individual tribal groups studied can be explained by variations in socio-economic and physical environmental factors, which the different households are subjected to.

MATERIALS AND METHOD

In the present paper, correlation and multiple regression using Statistical Package for Social Sciences (SPSS) has been utilized to study the impact of various variables on fertility, infant and child mortality and usage of family planning methods among the Scheduled Tribes of Rajasthan. (For details see Bhasin and Nag, 2007a, b, c, d, e)

The independent variables used for number of children ever born per ever-married woman are : age of woman, infant and child mortality, age at menarche, annual income, size of cultivable landholding, occupation of husband, occupation of wife, family structure, educational level of husband, educational level of wife, age at marriage of husband, age at marriage of wife, educational facility available, approach to village (road), post/telegraph facility available, telephone

facility available, medical facility available, type of house, separate cattleshed present, ventilation condition, general sanitary condition, number of rooms present, source of water supply, disposal of refuse nearby and usage of family planning methods.

The independent variables used for infant and child mortality (child loss per woman) are : age of woman, number of children ever born per ever-married woman, annual income, size of cultivable landholding, occupation of husband, occupation of wife, family structure, educational level of husband, educational level of wife, age at marriage of husband, age at marriage of wife, educational facility available, approach to village (road), post/telegraph facility available, telephone facility available, medical facility available, type of house, separate cattleshed present, ventilation condition, general sanitary condition, number of rooms present, source of water supply, disposal of refuse nearby and usage of family planning methods.

The independent variables used for usage of family planning methods are: age of woman, number of surviving children per currently-married woman, annual income, size of cultivable landholding, occupation of husband, occupation of wife, family structure, educational level of husband, educational level of wife, age at marriage of husband, age at marriage of wife, educational facility available, approach to village (road), medical facility available, type of house and number of rooms present.

In the present Scheduled Tribe population, the number of children ever born or live births per ever-married woman is found correlated with a number of variables. It shows significant

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positive correlation ($p < 0.05$) with age of woman, child loss per woman, family structure, occupation of wife and usage of family planning methods. As the age of woman increases the number of live births per woman increases. Child loss per woman is taken as an indicator of infant and child mortality. Child deaths result in more number of live births as women try to recompensate their loss to achieve their desired number of surviving children. Nuclear family structure as well as usage of family planning methods also seem to increase fertility. In fact, in the latter case older tribal couples are seen using a method, only when they have their desired number of children, often more than 3, and younger couples with fewer children use any method only rarely, as they are yet to realize their family size.

The number of children ever born alive per ever-married woman is found negatively correlated ($p < 0.05$) with education of husband, education of wife, age at marriage of husband, age at marriage of wife, educational facility available, approach to village (road), post office facility available, telephone facility available and number of rooms present in the house. As education level increases, fertility decreases. Late age at marriage results in low fertility as there is a delay in exposure to the risk of conception. Also, men and women who marry late, generally tend to be more educated and/or gainfully employed. Presence of relatively higher education facility in terms of high/higher secondary schools, presence of such communication facilities as, pucca or metalled road, post office, telephone etc., all tend to decrease fertility as these generally refer to greater exposure to the outside world, greater chances of being educated and/or employed, which in turn, often bring about changes in the traditional outlook towards fertility and contraception usage. Additionally, more rooms in the house often means greater economic standing of the family as well as less crowded condition which are conducive to child survival and lower fertility.

The individual tribal groups have also shown more or less similar correlation pattern with one or the other variables mentioned above.

Correlation of infant and child mortality (child loss per woman) with a number of independent variables has shown significant positive relationship ($p < 0.05$) with age of woman, disposal of refuse in the immediate surroundings, nuclear family structure and number of live births

per ever-married woman. Older women, are more prone to lose children because of several age-related factors. Also, disposal of refuse in the immediate surroundings pollute the atmosphere, which often give rise to morbid conditions. In the nuclear families, the mother is the primary person to take care of the children in the absence of additional kin, and hence the infant/child may be neglected when they are busy with household chores or outside work, if employed, which may not be conducive to child survival. As already mentioned, high fertility often leads to high offspring mortality and vice-versa.

Significant negative correlation ($p < 0.05$) exists between infant and child mortality and education of husband, education of wife, age of marriage of husband, age at marriage of wife, size of cultivable landholding, number of rooms, post office facility available, telephone facility available and approach to village (road). As the education level of husband and wife increases, infant and child mortality decreases. This may be due to the fact that educated people tend to consult doctors and have greater awareness of general sanitation, nutrition and availability of health services. Women who marry early and have children at a young age have high infant and child mortality, than women who marry at a late age. It is also seen that those who are landless or have smaller cultivable landholding have experienced greater child loss than those who have larger cultivable landholding. In fact, the size of land owned often refers to economic standing and owning large size of land means relatively better income. This in turn, indicates better resources to combat illness and environmental hazards and as a result such households have low child mortality. Similarly, more living space in houses in terms of more rooms also refers to higher economic status as well as better housing condition, which are conducive to child survival. Presence of such communication facilities as, pucca or metalled road, post office and telephone facility refer to greater exposure to the outside world, greater chances of being educated and/or employed, as well as exploiting the available medical resources, which generally are associated with greater survival of infants/children.

Individual tribal groups have shown similar correlation with one or the other independent variables mentioned above.

Usage of family planning methods is also

found correlated with a number of variables. Usage of family planning methods seems to increase as the age of woman increases, as well as when the number of surviving children increases. Naturally, women who are older have more children and the chances of their achievement of desired fertility goals being realized are high. Hence, usage of family planning methods is high when this occurs. Usage of family planning methods is also found positively correlated ($p < 0.05$) with income, size of cultivable landholding, occupation of husband, occupation of wife, education of husband, nuclear family structure, age of marriage of husband, age of marriage of wife, as well as when the approach to village is a pucca or metalled road. Relatively high income often results in greater usage of family planning methods as couples then usually have better access to family welfare services. Occupation in the service sector in case of husbands or simply becoming a gainfully employed person in case of wife, also increase the adoption of family planning methods, as there are greater chances of exposure to the outside world, which, tend to change traditional outlook, behaviour.

Similar explanations may be true when the ages at marriage of husband, wife are relatively high and also when the husbands are educated. Education besides creating awareness about the availability of various family planning methods also influences a couple's conception of family size.

Among the individual Tribes, one or the other above-mentioned factors have been found significantly correlated.

In the present study, multiple regression has been done for three dependent variables : 1) number of children ever born per ever-married woman, 2) child loss per woman, and 3) usage of family planning methods.

RESULTS AND DISCUSSION

Determinants of Fertility

In case of the fertility-related dependent variable – number of children ever born per ever-married woman, the following independent variables have been found statistically significant: child loss per woman – an indicator of infant and child mortality, age of woman, family structure, age at marriage of wife, educational level of

husband, and such communication facilities as, approach to village (road) and telephone facility available (within 5 km of residence) [Table 1].

Table 1: Determinants of number of children ever born per ever-married woman among the Scheduled Tribes of Rajasthan

<i>Independent Variables</i>	<i>Simple r</i>	<i>Beta</i>	<i>t-value</i>
Child mortality	0.595*	0.401*	15.847
Age of woman	0.563*	0.401*	16.192
Family structure	0.175*	0.130*	5.541
Age at marriage of wife	-0.281*	-0.154*	5.434
Education of husband	-0.198*	-0.057*	2.389
Approach to village (road)	-0.096*	-0.095*	3.122
Telephone facility available	-0.139*	-0.067*	2.549

* Significant at 0.05 percent
 Multiple R = 0.728
 R Square = 0.530

Child mortality is a very important variable in determining the level of fertility. The higher the child mortality, the higher is the fertility. High fertility could be a mechanism of recompensation to achieve desired reproductive goals. Age of woman has a positive impact on fertility, i.e., as the age increases, fertility also shows increment. And, while nuclear family structure has also shown a positive impact on fertility, age at marriage of wife is found to have a negative impact on the same. That is, as the age at marriage increases, fertility decreases. This could be due to delay in exposure to conception risk and the fact that there are more chances of their being educated and/or gainfully employed.

Educational level of husband also has a negative impact on fertility. As the husband's educational level increases, fertility decreases. Educated husbands generally tend to marry late, and their perception of family size and contraception also tend to deviate from the traditional to relatively modernized ones. Their chances of using any family planning method is also often more, as they have better knowledge.

Presence of pucca or metalled road near vicinity and telephone facility seem to have negative impact on fertility as these generally refer to relatively greater exposure to the outside world, greater chances of men and women being educated and/or employed, which usually change the traditional perceptions about fertility and family planning methods. Besides, these facilities

also indicate greater access to health and family welfare services, which too affect fertility and child survival.

Jain (1985) studying the regional variation of fertility in India by multiple regression demonstrates that conditions conducive to fertility decline include high adult female literacy, low infant mortality, high contraceptive usage and high female age at marriage. According to him, the pace of fertility decline in the future could depend upon the pace of infant mortality decline, enhancement of female education and improvements in family planning programme.

Natarajan (1989) studying fertility and child mortality in Uttar Pradesh has also shown by regression analysis that child mortality seems to be a very important variable in determining the level of fertility and that female literacy is negatively correlated with both child mortality and fertility. He has summarized that variations in couples per 1000 population, literate females in age group 15-34 years and provision of health facilities seem important factors explaining variation in fertility.

Determinants of Infant and Child Mortality

Child loss per woman is used as an indicator of infant and child mortality in the present study, and is considered as a dependent variable. As seen in Table, the independent variables, which are found to be statistically significant are: number of children ever born or number of livebirths, post/telegraph facility available (within 5 km or residence), cultivable landholding owned by household and age of marriage of wife.

Child mortality increases as the number of live births or fertility increases. When child mortality is high, parents attempt to have more children in order to achieve their desired family size.

Table 2: Determinants of infant and child mortality among Scheduled Tribes of Rajasthan

<i>Independent variables</i>	<i>Simple r</i>	<i>Beta</i>	<i>t-value</i>
Number of live births	0.591*	0.554*	19.513
Post office facility available	-0.144*	-0.075*	2.709
Cultivable landholding	-0.082*	-0.085*	2.886
Age at marriage of wife	-0.224*	-0.076*	2.472

* Significant at 0.05 percent

Multiple R = 0.594

R Square = 0.353

Presence of such communication facilities as post offices within vicinity of the house refers to greater exposure to the outside world, which often changes the traditional outlook, eventually leading to greater and timely exploitation of available medical services, which in turn is generally associated with greater survival of infants/children.

It is also seen that cultivable landholding by households has a negative impact on child loss. That is, those who are landless or have smaller cultivable landholding have experienced greater child loss than those who have larger cultivable landholding. In fact, the size of land owned often refers to economic standing and owning large size of land means relatively better income. This in turn, indicates better resources to combat illness and environmental hazards and as a result, such households have low infant and child mortality.

Age at marriage of wife is also found exerting negative impact on child mortality. Women who marry early and have children at a young age have high infant and child mortality than women who marry at a late age. Besides, late marriage also often refers to greater chances of their being educated and/or employed, which are conducive to child survival.

Studies have been conducted to examine the association between infant/child mortality and female education, income and other variables. Flinn (1986) reported that individuals with more land tend to have more reproductive success (offspring surviving to one year of age). Kulkarni et al. (1990) doing regression analysis on data from 74 countries showed the strong effect of female literacy and income on infant mortality. Caldwell et al. (1990), United Nations (1994) have highlighted the association of women's education with infant and child mortality.

Table 3: Determinants of usage of family planning methods among Scheduled Tribes of Rajasthan

<i>Independent variables</i>	<i>Simple r</i>	<i>Beta</i>	<i>t-value</i>
Age at marriage of wife	-0.311*	-0.229*	6.559
Age of woman	0.275*	0.210*	6.144
Medical facility available	0.228*	0.138*	4.006
Education of husband	0.102*	0.130*	3.923
Family structure	0.144*	0.120*	3.605

* Significant at 0.05 percent

Multiple R = 0.436

R Square = 0.190

Determinants of Usage of Family Planning Methods

When usage of family planning methods is the dependent variable, age at marriage of wife seems to exert significant negative impact on the same and age of woman, presence of better medical facilities (within 5 km of residence), education of husband, nuclear family structure are seen to exert positive impact (Table 3).

When women are older, the chances of achievement of desired fertility goals are high, hence usage of family planning methods is high when this occurs, particularly in demographically backward regions like Rajasthan, and communities like Scheduled Tribes, living therein. Better medical facilities near vicinity of houses in terms of qualified doctors/paramedics refer to greater chances of being motivated to use contraception. Relatively higher education, besides creating awareness about the availability of various family welfare services including methods, also influences a couple's conception of family size. In nuclear families, greater privacy, husband-wife communication in the absence of traditional control by in-laws or other kin, often lead to greater usage of contraceptives.

The Nation Family Health Survey Subject Reports have analysed the effects of a number of predictor variables on contraceptive prevalence rates in each state and India as a whole. They found education (husband and wife) to have a strong effect on contraceptive use. Also women, who are not from Scheduled Castes and Scheduled Tribes have a higher contraceptive prevalence rate than either Scheduled Caste/Scheduled Tribe women, though there is considerable variability among states (National Family Health Survey Subject Reports, 1996).

Raju's (1987) study on socio-economic factors in family planning adoption in Andhra Pradesh revealed that contraception was more readily adopted by the Caste Hindus than the Scheduled Castes; educated husbands and the husbands who were having high socio-economic status. And, Singh (1986) has reported that awareness, usage of contraceptives and motivation for the same are more in nuclear than in joint family set-ups.

Therefore, it appears that a variety of factors are affecting the fertility, mortality as well as contraceptive usage. And, differentials in these are responsible for intra-and inter-population differences. Also, the present Scheduled Tribe

population as a whole, is demographically rather backward, with relatively high percentage of child population (under 15 years), dependency ratio, low proportion of economically active women, literacy rate, age at marriage of women, high fertility and mortality as well as high percentage of non-users of contraception.

It seems that most of the Scheduled Tribe population are still living in kuchcha houses, in unsanitary, crowded condition without separate kitchen, cattleshed, power supply and disposing the refuse in the open/in the immediate surroundings. They also do not have access to or not accessing the educational, medical facilities available. Nearly all of them also have a strong belief in traditional/folk medical care or faith healers. The tribes are also plagued by inadequate irrigation facilities, drought proneness, marketing network as well as high degree of indebtedness and none or poor cattle breed ownership. Many are still pursuing subsistence agriculture, having small size of landholding and following traditional method of cultivation. An overwhelming large segment are also engaged in agricultural/casual labour, and often they have migrate to other areas for work.

Individually, the Scheduled Tribes, Mina and to a certain extent Damor may be considered at a more advantageous position than Sahariyas, Bhils, Kathodis, Garasias.

All the above mentioned aspects not only indicate low level of development, potential for population growth, which in turn, have a bearing on the health and well being of the present Scheduled Tribe population, which seems rather unsatisfactory and require urgent intervention. Also, the incidence of 'Coughs'/infections diseases, including tuberculosis, needs to countered immediately to improve the health status of the Scheduled Tribe.

As already mentioned, the health and nutritional status of the Scheduled Tribes in Rajasthan appear far from satisfactory. They are demographically backward and the level of overall development is relatively low as well. Therefore, it is felt that an effective comprehensive programme may be developed in conjunction with revamping of the extant programmes to address the lacunae and crucial issues in the realm of immediate physical, nutritional, socio-economic environment simultaneously. In this context, following recommendations formulated on the basis of the findings of the present study may be considered for incorporation in various action

plans and programmes for the overall development of the Scheduled Tribes of Rajasthan. However, the tribes, who are the most disadvantaged may be targeted first. It may also be noted that despite the formulation and implementation of several ameliorative measures by the governmental authorities and even by the various non-governmental organizations the state of health and well being have remained unsatisfactory and the pace of development among the Scheduled Tribes has remained rather slow. A considerable chunk have not benefited from the elaborate schemes formulated especially for them due to a number of reasons. Broadly speaking, the paucity seems to be the result of lack of information, education and communication (IEC), self-independence, capacity building at the micro-level particularly among the Scheduled Tribes; over-dependence on aid, lack of post-aid/benefit follow ups by the donor organizations including government agencies, as well as lack of motivation, enterprise. It needs to be specially stressed here that post-aid/benefit operational costs in case of several schemes/programmes as well as any remaining amount of money to be invested by the Tribes are considered unaffordable, as economically they are rather backward and there exists short-sightedness as well – these issues require immediate corrective actions.

REFERENCES

- Bhasin, M.K. and Nag, Shampa: Demography of the Tribal Groups of Rajasthan.
1. Population structure. *Anthropologist*, **9**: 1-36 (2007a)
 2. Levels, differentials and trends in fertility. *Anthropologist*, **9**: 37-44 (2007b).
 3. Levels, differentials and trends in mortality. *Anthropologist*, **9**: 45-54 (2007c).
 4. Selection Intensity. *Anthropologist*, **9**: 45-54 (2007d)
 5. Dynamics of family planning methods usage. *Anthropologist*, **9**: 45-54 (2007e)
- Caldwell, J., Findley, S. and Caldwell. P.: What do we know about health transition. The cultural, social and behavioural determinants of health. *Health Transition Series No. 2* (Vol 1). Health Transition Centre, Canberra (1990).
- Flinn, M.V.: Correlates of Reproductive Success in a Caribbean village. *Hum. Ecol.*, **14**: 225 (1986).
- Jain, A.K. : The impact of development and population policies on fertility in India. *Studies in Family Planning*, **16**: 181 (1985).
- Kulkarni, P.M., Krishnamoorthy, S. and Devaraj, K.: Effects of education and income on infant mortality: An assessment of the intermediate variable framework. *Demography India*, **19**: 263 (1990).
- Natarajan, K.S.: Fertility and child mortality in Uttar Pradesh: An areal analysis. p. 229. In : *Population Transition in India*. S. N. Singh, M.K. Premi, P.S. Bhatia and A. Bose (Eds.). B.R. Publishing Corporation, Delhi (1989).
- National Family Health Survey, Subject Reports No. 2. *Contraceptive Use in India, 1992-93*. E.M. Ramesh, S.C. Gulati and R.D. Retherford, IIPS, Mumbai, East-West Center Programme on Population, Honolulu, Hawaii, USA. (1996).
- Raju, S.S.: Socio-economic factors in family planning adoption. *Social Change*, **17**: 53 (1987).
- Singh, K.P.: *Correlates of Fertility Behaviour*. Concept Publishing Company, New Delhi (1986).
- United Nations: *The Health Rationale for Family Planning: Timing of Births and Child survival*. United Nations, New York (1994).