



Impact of Son Preference on Fertility Indices in Manipur

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The societies with high fertility rate exposed very less rate of son preference over daughter. But the fertility decline has a linkage of greater demand for son than daughter. In Manipur, a high proportion i.e. 31.2% of married women want more sons than daughters according to NFHS-3 which is declining from that of 36.5% in NFHS-2 and 43.4% in NFHS-1, so that, the factors associated with desire of more sons have caused high fertility indices in the state. The objective of this study is to investigate the socio-demographic determinants of fertility differential and the third birth transition. This is a cross sectional, community based study of 1296 women and was conducted through a cluster sampling scheme in four valley districts of Manipur – Bishnupur, Imphal East, Imphal West and Thoubal. The multiple and logistic regression models are adopted in addition to the classical statistical tests. Results show that, the age at marriage, education, income, desire number of son, duration of marriage, infant mortality etc. have significant contribution on the variation of fertility indices. One of the most important determinants of the fertility indices is son preference which is quantified by desire number of son in one way or others. The son preference is most important factor among other socio-demographic determinants of fertility differentials in Manipur. The findings may be useful in community maternal health management.

Keywords: Son preference, age at marriage, infant mortality, odds ratios

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In traditional societies with high fertility regimes, there is not much of sex preference for children. When the fertility declines a relatively greater demand for sons than daughters is noticed. It is not generally considered in Western-industrial societies. Analyzing the data from the United States, Pollard and Morgan (2002) find an evidence of preference for a balance family with at least one son and one daughter. Hank and Kohler (2000) support the balance family in many European countries. But they also find some countries with a girl preference. In Denmark, say for instance, there is a preference for balanced composition of sex, but also a mild girl preference in the families (Jacobsen et al., 1999). In many developing countries, reproductive intentions and behaviors are strongly influenced by sex of surviving children (Arnold, 1985; Park, 1986; Sather, 1987; Koenig and Foo, 1992; Arnold, 1997; Hussain et al., 2000;

Youssef, 2005; Khawaja and Randall, 2006). Utilizing Demographic and Health Survey (DHS) data from fifty-seven countries, Arnold (1997) empirically shows that son preference exists particularly strong in Southern Asian Countries. Women's contraceptive use and duration of last birth interval are also linked to stopping childbearing after the birth of a son in Nepal (Leone et al., 2003).

LITERATURE REVIEW

Studies in India have identified three major factors that underlie such socio-demographic phenomenon. They are economic, socio-cultural and religious utilities. Sons are more likely than daughters to provide family labor on the farm or in family business and support their parents of old age, although there is some recognition that sons are no longer a dependable source of old age support (Bardhan, 1988; Mason, 1992; Dharmalingam, 1996; Nath and Deka, 2004). Marriage of son provides additional help to the family as well as an economic reward in the form

of dowry payments. In the context of India's patriarchal family system, having one son is imperative for continuation of the family line, and many sons provide additional status to the family (Kapadia, 1966; Moore, 1994). The utility of having sons also arises from the important religious functions that only sons can provide (Nath and Leonetti, 2001). According to Hindu tradition, sons are needed to kindle the funeral pyre of their deceased parents and to help in the salvation of their souls. Most of the Indian couples have thus a strong preference for sons over daughters. In an effort to have sons, many couples continue to have children after achieving their desire family size. In case of intention, about 20% of Indian couples want more sons than daughters, but only 2 to 3% of them want more daughters than sons (IIPS, 2007). In Manipur, 31.2% of ever married women who want more sons than daughters according to NFHS-3:2005-06, which is declining from that of 36.5% in National Family Health Survey, NFHS-2:1998-99 and 43.4% in NFHS-1:1992-93 (IIPS, 2008). Despite, no community based study has so far been conducted in the state particularly in hill and rural areas where 'natural fertility' (Henry, 1961) seems to be existed. Thus, this study attempts to investigate the socio-demographic determinants of fertility differential and the third birth transition.

METHODOLOGY

Under the financial assistance of University Grants Commission's research project (No. F.5-331/2009-10(MRP/ NERO)/ 5808 dated 14/ 12/ 2009), a cross sectional as well as community based study of 1294 currently women was conducted through a cluster sampling scheme in four valley districts of Manipur - Bishnupur, Imphal East, Imphal West and Thoubal. The multiple regression and logistic regression models are adopted in addition to the classical statistical tests. Here, the response variable 'fertility' is defined by the number of children ever born to a mother and the third birth transition is quantified by the issue of third live birth.

Sex preference of children may be measured in two ways (Gray and Evans, 2004). Firstly, by examining 'intention data' which focuses on the respondent's sex preference of future births. The second method is by examining 'behavioral

data' which investigates respondent's fertility behavior given the sex of existing children. The intention data is situation dependent (Marleau and Saucier, 2002). Behavioral data reveals actual preferences in that progression from at least one to higher parity based on existing children. However, this method cannot be used to look at sex preference of an only or first child (Goodkind, 1999). The present article focuses the effect of sex preference on fertility level using intention data quantified by the couple's desire number of son.

Analysis

The two response variables are taken - i) fertility, which is defined by the actual number of live birth and ii) third birth transition, quantified to be 1, if the mother has at least third live birth and 0, otherwise. The explanatory variables considered are religion, type of family, educational level, employment status, age at marriage, duration of marriage, couple's desired number of son* (son preference), use of contraceptives during transition of third birth and generation fertility. For categorical factors, binary (0, 1) dummy variables are utilized. The educational level is measured by the number of completed academic years in education. In the case of generation fertility, 1st, 2nd, and 3rd generations takes husband, husband's father and husband's grandfather. The inclusion of explanatory variables in the regression models is performed subject to the scanning of multicollinearity.

Results

A multiple regression on current fertility with respect to explanatory variables of interest is adopted. Out of fourteen classified variables only four ones have been identified to have significant impact on the current fertility differentials in the study population. These are duration of marriage ($p < 0.001$), use of contraceptives ($p < 0.05$) during the transition of third birth, couple's desire number of son ($p < 0.01$) and the Islam religion ($p < 0.001$) as shown in table-1.

Model Variable	Unst. coef.		St. coef.	t	p	95% CI for β	
	β	SE	β			Lower	Upper
(Constant)	.941	.395		2.382	.018	.164	1.717
Type of family	.029	.083	.010	.348	.728	-.135	.193
Religion (Hindu)	-.141	.120	-.034	-1.169	.243	-.378	.096
Religion (Islam)	2.191	.349	.184	6.274	.000	1.505	2.878
Education of husband	.002	.014	.005	.157	.875	-.025	.030
Education of wife	.004	.010	.012	.341	.733	-.017	.024
Employment status of husband	.020	.088	.007	.228	.820	-.153	.193
Employment status of wife	-.106	.191	-.016	-.553	.580	-.482	.270
Age at marriage	-.007	.009	-.025	-.779	.436	-.026	.011
Fertility of Generation-1	.020	.022	.026	.903	.367	-.023	.063
Fertility of Generation-2	-.001	.018	-.002	-.073	.942	-.036	.034
Fertility of Generation-3	.019	.018	.030	1.077	.282	-.016	.055
Couple's desire number of son	.158	.051	.089	3.109	.002	.058	.258
Use of contraceptive device	-.497	.195	-.071	-2.553	.011	-.880	-.114
Duration of marriage	.129	.005	.776	23.925	.000	.119	.140

Model Summary: $R^2=0.705$, $F= 68.739$, $p < 0.001$; Durbin-Watson = 1.973

Table-1: Adjusted regression coefficients on current fertility

In this table, each four influential factors are observed, their level of significance after adjustment of the joint effects of other variables. The results are detected by the multiple regression model having its specifications - $R^2 = 70.5$, $F = 68.74$, $p < 0.001$, Durbin-Watson (D) =

1.97. Under stepwise regression analysis, the elsewhere four variables can be detected to be the most important factors so called determinants of fertility indices in study population (table-1a).

Model Variables	Unst. coef.		St. coef.	t	p	95% CI for β	
	β	SE	B			Lower	Upper
1 (Constant)	.742	.062		11.974	.000	.620	.864
Duration of marriage	.135	.005	.808	27.959	.000	.125	.144
2 (Constant)	.721	.059		12.281	.000	.605	.836
Duration of marriage	.134	.005	.801	29.266	.000	.125	.143
Religion (Islam)	2.299	.326	.193	7.057	.000	1.659	2.939
3 (Constant)	.425	.111		3.814	.000	.206	.643
Duration of marriage	.132	.005	.793	29.161	.000	.123	.141
Religion (Islam)	2.384	.324	.200	7.368	.000	1.748	3.020
Couple's desire no. of son	.151	.049	.085	3.119	.002	.056	.247
4 (Constant)	.873	.213		4.093	.000	.454	1.293
Duration of marriage	.132	.005	.789	29.127	.000	.123	.140
Religion (Islam)	2.406	.322	.202	7.479	.000	1.774	3.039
Couple's desire no. of son	.152	.048	.085	3.141	.002	.057	.246
Use of contraceptive device	-.463	.188	-.066	-2.459	.014	-.832	-.093

Model Summary: $R^2=0.702$, $F= 242.582$, $p < 0.001$; Durbin-Watson = 1.788

Table-1a: Stepwise regression coefficients on current fertility

The levels of significance and the directions of influence are also found to be similar in nature.

But, the values of regression coefficients observed in the later model are somewhat

different from the previous model owing to its model summary viz., $R^2 = 70.2$, $F = 242.58$, $p < 0.001$, $D = 1.49$.

wife ($p < 0.01$, OR = 0.87 with 95% CI: 0.82–0.92), age at marriage of wife ($p < 0.01$, OR =

0.87 with 95% CI: 0.82–0.92), use of contraceptives ($p < 0.05$, OR = 0.23 with 95% CI: 0.08–0.71) and employment of husband ($p < 0.05$, OR = 1.88 with 95% CI: 1.13–3.12) elicited in table-2.

Variables	β	S.E.	Wald	P	Exp(β)	95% CI for exp(β)	
						Lower	Upper
Religion (Hindu)	.013	.358	.001	.972	1.013	.502	2.042
Religion (Islam)	-.129	1.025	.016	.900	.879	.118	6.554
Fertility of Generation-1	.171	.067	6.561	.010	1.186	1.041	1.352
Fertility of Generation-2	-.138	.055	6.363	.012	.871	.782	.970
Fertility of Generation-3	.023	.055	.180	.671	1.024	.919	1.140
Education of husband	.025	.043	.341	.559	1.025	.943	1.115
Education of wife	-.143	.031	21.311	.000	.867	.816	.921
Age at marriage of wife	-.122	.042	8.628	.003	.885	.815	.960
Age at marriage of husband	-.025	.038	.439	.508	.975	.905	1.051
Couple's desire no. of son	.154	.156	.975	.323	1.167	.859	1.586
Employment status of husband	.570	.268	4.546	.033	1.769	1.047	2.989
Employment status of wife	-.333	.676	.242	.623	.717	.191	2.697
Use of contraceptive device	-1.525	.594	6.595	.010	.218	.068	.697
Constant	4.448	1.180	14.219	.000	85.442		

Table-2: Adjusted Odds Ratios on 3rd birth transition

However, the results are observed with a little bit varied of significance levels and odd ratios (OR) in the two models. The significant factors found in the last model are fertility of generation-1 ($p < 0.05$, OR = 1.17 with 95% CI: 1.03–1.32), fertility of generation-2 ($p < 0.05$, OR = 0.87 with 95% CI: 0.78 – 0.97), educational level of

More specifically, binary logistic regression analysis on the transition of third birth (1 if at least 3rd birth occurred, 0 otherwise) is also carried out to identify the determinants thereof. Here, six determinants out of thirteen factors can be detected in both adjusted and stepwise methods shown in table-2a.

Steps	B	S.E.	Wald	P	Exp(β)	95% CI for exp(β)	
						Lower	Upper
Step 1 Education of wife	-.158	.024	42.757	.000	.854	.814	.895
Constant	.789	.246	10.251	.001	2.201		
Step 2 Education of wife	-.123	.026	22.556	.000	.884	.840	.930
Age at marriage of wife	-.134	.029	21.780	.000	.875	.827	.925
Constant	3.539	.645	30.109	.000	34.427		
Step 3 Education of wife	-.124	.026	22.155	.000	.884	.839	.930
Age at marriage of wife	-.137	.029	22.101	.000	.872	.824	.923
Use of contraceptive device	-1.376	.565	5.945	.015	.252	.083	.763
Constant	4.920	.889	30.633	.000	137.054		
Step 4 Education of wife	-.138	.027	25.495	.000	.871	.825	.919
Age at marriage of wife	-.134	.029	20.999	.000	.875	.826	.926
Employment status of husband	.582	.253	5.312	.021	1.790	1.091	2.937
Use of contraceptive device	-1.302	.562	5.363	.021	.272	.090	.819
Constant	4.717	.892	27.977	.000	111.874		
Step 5 Fertility of Generation-2	-.122	.053	5.249	.022	.885	.797	.982
Education of wife	-.142	.028	26.342	.000	.867	.821	.916
Age at marriage of wife	-.134	.029	21.183	.000	.874	.826	.926
Employment status of husband	.585	.255	5.263	.022	1.796	1.089	2.961
Use of contraceptive device	-1.441	.580	6.180	.013	.237	.076	.737
Constant	5.539	.978	32.049	.000	254.385		
Step 6 Fertility of Generation-1	.158	.065	5.977	.014	1.171	1.032	1.329
Fertility of Generation-2	-.138	.054	6.486	.011	.871	.783	.969
Education of wife	-.139	.028	24.348	.000	.870	.823	.920
Age at marriage of wife	-.142	.030	22.665	.000	.868	.819	.920
Employment status of husband	.631	.258	5.979	.014	1.879	1.133	3.116
Use of contraceptive device	-1.466	.576	6.483	.011	.231	.075	.714
Constant	4.906	1.004	23.886	.000	135.083		

Table-2a: Stepwise Odds Ratios on 3rd birth transition

CONCLUSION

The results of the study clearly indicate four determinants of fertility differential are duration of marriage, Islam religion, contraceptive uses and couple's desire number of sons. As such, the four significant factors fit the last regression model. However, the duration of marriage is demographic factor which cannot be managed by couple after marriage while religion is social factor which cannot be controlled by individual level too. The duration of marriage is transformed from mother's age at marriage. Bavel (2003) also observed that for many pre-industrial populations that the duration of marriage influences age specific marital fertility. But, the

reason remains unclear. The possible reasons are given by past findings of Kirdar et al. (2009) and Lieberman (2009). They stressed in their findings that the age at first association of younger partner in early marriage predicts fertility is that co-residence duration or duration of marriage serves as a cue to sibling ship mainly for younger partner; older partners use a different kinship cue not influenced by durations of association. This view is supported by Raj et al. (2009). While adjusted the joint effects of three other variables in the last regression model, Islam religion is observed to be high influential factor ($p < 0.001$) leading to high fertility in the present analysis. It might have thought to be caused by

the fact that Muslim women are low educated, having low income, taking early marriage and hence resulting high fertility. Mahadevan (1979) emphasized that Muslim religious doctrine does not specially prohibit voluntary birth limitation, the institutional pressures to have many children, especially sons, are strong. It is again supported by Singh et al. (2007).

Among the two behavioral factors – desire number of son ($\beta = 0.152$, $p < 0.07$) has more influential on high fertility than use of contraceptives which can reduce the current fertility ($\beta = -0.463$, $p < 0.05$). From this result, it may be interpreted as couple's desire of one more son gives an increase of 0.15 in current fertility level with 95% CI: 0.06–0.25. The finding is in agreement with some other past findings. In many developing countries, reproductive intentions and behaviors are strongly influenced by sex of surviving children (Hussain et al. 2000; Youssef, 2005; Khawaja and Randall, 2006; IIPS, 2007). This ill behavior may have retarded India's fertility decline and therefore the present fertility level is far behind the national socio-demographic goals to be achieved by 2010 according to National Population Policy 2000. Fertility of generation-2, educational level, age at marriage and contraceptive uses have also negative as well as significant impacts on third birth transition for many reasons. It is witnessed in the logistic regression analysis. The significance of the factors may be interpreted as similar in the case of multiple regression analysis.

REFERENCES

- Arnold, F. R. (1985). Measuring the effect of supravergence on fertility: The case study of Korea. *Demography*, 22: 280–288.
- Arnold, F. R. (1997). Gender preference for children: Findings from Demographic and Health Surveys. Paper presented at the 23rd General Population Conference of the International Union for the Scientific Study of Population (IUSSP), Beijing.
- Bardhan, P. K. (1988). Rural poverty in South India. In T. N. Srinivasan and P. K. Bardhan (Eds), *Sex disparity in child survival in Rural India*, 472–482.
- Bavel, J. V. (2003). Does an effect of marriage duration on pre-transition fertility signal parity-dependent control? An empirical test in 19th century Leuven, Belgium. *Population Studies*, 57(1): 55–62.
- Bongaarts, J. & Potter, R.G. (1983) *Fertility, biology and behavior*. 1st Ed. New York: Academic Press.
- Goodkind, D. (1999). Should parental sex selection be restricted? Ethical questions and their implications for research and policy. *Population Studies*, 53: 49–61.
- Dharmalingam, A. (1996). The social context of family size preferences and fertility behavior in a South Indian village. *Genus*, 52: 83–103.
- Directorate of Economics & Statistics. (2007). *Gender Statistics Manipur. Govt. of Manipur*. 2–18.
- Directorate of Economics & Statistics. (2008). *Economic Survey: Manipur 2007–08. Govt. of Manipur*, 8–19.
- Gray, E. & Evans, A. (2004). Parity progression in Australia: What role does sex of existing children play? Paper presented at 12th Biennial Conference on population and society: issues, research, policy. Canberra, Australia.
- Hank, K. & Kohlar, H. P. (2000). Gender preferences for children in Europe: Empirical results from 17 FFS Countries. *Demographic research*, 2:256–261.
- Henry, L. (1961). Some data on natural fertility. *Eugenics Quarterly*, 8: 81–91.
- Hussain, R., Fikree, F. F. & Berendes, H. W. (2000). The role of son preference in reproductive behavior in Pakistan. *Bulletin of the World Health Organization*, 78(3): 379–388.
- International Institute for Population Sciences (IIPS). (2007). *National Family Health Survey–3, 2005–06: Key findings*, 5–7.
- International Institute for Population Sciences (IIPS). (2008). *National Family Health Survey–3, 2005–06: Manipur*, 46.
- Jacobsen, R. Mollar, H. & Engholm, G. (1999). Fertility rates in Denmark in relation to the sexes of preceding children in the family. *Human Reproduction*, 14: 1127–1130.
- Kapadia, K. M. (1966). *Marriage and family in India*. 3rd Ed. Bombay: Oxford University Press.
- Kirdar, M.G., Dayoglu, M. & Koç, I. (2009). The Impact of Schooling on the Timing of Marriage and Fertility: Evidence from a Change in Compulsory Schooling Law. Unpublished, (mpira.ub.uni-muenchen.de/13410 dated 25/ 09/ 09)
- Khawaja, M. & Randall, A. (2006). Intifada, Palestinian fertility and women's education. *Genus* LXII(1): 21–51.
- Koenig, M. A. & Foo, H. C. (1992). Patriarchy, women's status and reproductive behavior in rural North India. *Demography India*, 21: 145–166.
- Lieberman, D. (2009). Rethinking the Taiwanese minor marriage data: Evidence the mind uses multiple kinship cues to regulate inbreeding avoidance. *Evolution and Human Behavior*, 30(3): 153–160.
- Leone, T., Matthews, J. & Zuanna, G. D. (2003). Impact and Determinants of Sex Preference in Nepal. *International Family Planning Perspectives*, 29(2): 69–75.

- Mahadevan, K. (1979), Sociology of fertility: Determinants of fertility differentials in South India. Staling Publishers, New Delhi, 114–117.
- Marleau, J. D. & Saucier, J. F. (2002). Preference for a first-born boy in Western societies. *Journal of Biosocial Sciences*, 34: 13–27.
- Mason, K. O. (1992). Family change and support of elderly in Asia: What do we know? *Asia Pacific Population Journal*, 7(3): (East West Centre Reprint Series No. 286).
- Moore, M. (1994). Indian Plan thwarted by quest for sons: Population grows as farmers insist upon two male heirs. *Washington Post*, Sept; A 26.
- Nath, D. C. & Leonetti, D. L. (2001). Dynamics of population change (Emerging issues of 21st Century). In R. C. Yadava (Eds), *Correlates of coital patterns in a traditional Indian society*. Delhi, 57–67.
- Nath, D. C. & Deka, A. K. (2004), The importance of son in a traditional society: How elderly parents see it? *Demography India*, 33(1): 33–46.
- Park, C. B. (1986). How many births are attributable to preference for sex of children? A simulation analysis. Paper presented at the Annual Meeting of the Population Association of America, San Francisco.
- Pollard, M. S. & Morgan, S. P. (2002). Emerging parental gender indifference? Sex composition of children and the third birth. *American Sociological Review*, 67: 600–613.
- Raj, A., Sagguti, N., Balaiah, D. & Silverman, J.G. (2009). Prevalence of child marriage and its effect on fertility and fertility-control outcomes of young women in India: a cross-sectional, *Observational study*, *Lancet*, 373:1883–1889.
- Singh, N. S., Narendra, R. K. & Hemochandra, L. (2007). Determinants of waiting time to conception in Manipuri women. *Kuwait Medical Journal*, 39(1): 39–43.
- Sather ZA. (1987). Does female education affect fertility behavior in Pakistan? *Pakistan Demographic Review*, (4): 573–589.
- Youssef, R. M. (2005). Duration and determinants of interbirth interval: Community-based survey of women in southern Jordan. *Eastern Mediterranean Health Journal*, 11(4): 559–572.