Impact of Son Preference on 3rd Birth Transition in Manipur: A Logistic Regression Analysis

Dr. Ph. Kamala Devi

Asst. Professor in Statistics D. M. College of Science Imphal under Manipur University, Imphal

Abstract: *Using cluster sampling technique, a cross sectional as well as community based study of 1029 currently married women was conducted in four valley districts (Bisnupur, Imphal East, Imphal West and Thoubal) of Manipur, a north eastern border state of India. The sample survey was completed during August, 2011 to February, 2012. Logistic regression analysis explores the significant causal factors of 3rd birth transition to be low education (P<0.01), sex of 2nd birth (P<0.05) and couple's desire number of son (P<0.01). And son preference is observed to be most influencing on 3rd birth phenomenon.*
Key words: *replacement fertility, 2nd live birth, sex at birth, education, odds ratio,*

I.   Introduction

Following the International Conference on Population and Development (ICPD-1994) held in Cairo in its sole concern with fertility reduction, India's National Population Policy (NPP) - 2000 had formulated the three level objectives – short, medium and long term. While the medium-term objective is to bring the Total Fertility Rate (TFR) to replacement level 2.1 by 2010, its long-term objective is to achieve a stable population by 2045, at a level consistent with the requirements of sustainable economic growth, social development, and environmental protection. After six decades of having national population policy in our country, fertility rates are higher for women in disadvantage groups say for instance 3.1 children per women among schedule tribes, 2.9 among scheduled castes, and 2.8 among other backward classes, compared with women who are not any of these groups (2.4 children) while its all India figure of 2.7 (IIPS, 2008).

Meanwhile, the 3rd birth transition is a serious demographic phenomenon to such fertility disparity. It also affects the strategic efforts to succeed the national socio-demographic goal of replacement fertility (TFR=2.1) to be achieved by 2010 and retargeted by 2014. Lack of education and son preference may be sole responsible to it. The past studies conducted in India have identified three major factors for son preference. They are economic, socio-cultural and religious utilities. Sons are more likely than daughters to provide family labour 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 (Nath and Deka, 2004). A son brings upon marriage a daughter-in-law into his family and she provides additional help around the house 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. 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 NFHS-2:1998-99 and 43.4% in NFHS-1:1992-93(IIPS, 2008).

II.   Objectives

The objective of the present investigation is to find out the causal factors of 3rd birth transition, one of the serious demographic phenomenon subject to the fertility control in Manipur. Specifically, it is to explore the effect of son preference on the 3rd birth transition.

III.   Materials and Methods

A cross sectional as well as community based study of 1029 eligible mothers was conducted through a cluster sampling technique in four valley districts of Manipur viz., Bishnupur, Imphal East, Imphal West and Thoubal during the seven months period from August, 2011 to February, 2012. The State is one of the North Eastern border states of India inhabited mainly by the Mongoloid race. Under cluster sampling, the primary data was collected by using a pre-tested and semi-structural interview schedule as a tool for survey. The cluster with

rural-urban differential is defined according to Population of Manipur (Directorate of Economics & Statistics 2008).

Binary logistic regression model is used to examine the impacts of socio-demographic factors on the phenomenon of 3rd birth transition. In this study, the phenomenon is taken as dependent variable. The model is based on the fact that the dependent variable is dichotomous which is defined to be 1 if the woman has at least 3rd live birth and 0, the women has at most two live births. the ten independent variables of interest are residence – (rural=1, urban=0), educational levels of husband, educational levels of wife, family income, age at marriage of husband, age at marriage of wife, mother's age at 2nd delivery, couple's desire number of son, sex of 2nd live birth (male=1, female=0) and status of sterilization (wife is sterilized=1, otherwise=0). Among the variables, age, income and sex preference defined to be the desire number of son have their quantitative values and hence at present, no difficulties of measurement. For categorical variables – residence, sex and status of sterilization, binary dummy variable (0, 1) is utilized. As the education has no quantitative value leading to some difficulties of measurement so that it has been quantified by levels of education viz., Illiterate (level-1), literate but under matriculate (level-2), matriculate but below ten plus two standard (level-3), ten plus two standard but undergraduate (level-4), graduate and above(level-5). While interpreting the results, the regression coefficient (β), its P-value (significance level of β) and Odds Ratio (exp(β)) are used.

IV. Analysis and Results

Out of 1029 eligible women, about 50% that is 509 women are found to have their third birth in the population. A binary logistic regression analysis on the transition of third birth (1 if at least 3rd birth occurred, 0 otherwise) is carried out to identify the determinants thereof. In the multiple logistic regression models, only three out of the ten independent variables can be detected to have their significant impacts on the 3rd birth transition in the population. The adjusted OR levels of the variables with their 95%CI are manifested in Table-1. The significant factors found in the model are age at 2nd delivery of wife (P<0.01, OR=0.83), couples' desire number of son (P<0.01, OR=3.95) and sex of 2nd live birth (P<0.05, OR=0.55). Age at 2nd delivery of wife and sex (male) of 2nd live birth are negatively as well as significantly associated with 3rd birth transition. But, the behavioural factor – couples' desire number of son is positively and highly significantly related with the serious phenomenon of 3rd birth. The level of significance of each contributed variable is observed after adjusted or keeping constant the joint effects of other nine background variables under study.

Applying stepwise method in the logistic regression, specifically Forward Wald-method, the determinants of 3rd birth transition is found to be five factors. In other words, only five independent variables have been identified to be elements of the best set of 3rd birth transition. They are couple's desire number of son, age at 2nd delivery, education of husband, sex of 2nd live birth and status of sterilization shown in Table-2. In the last fifth model, the logistic regression is fitted with the five variables. It is to say that the logistic regression model is significant with these five independent variables. After adjusted the joint effects of combination of four other variables in the last model, education of husband, age at second delivery, sex of second baby and status of sterilization of wife are found to be negatively associated with the third birth transition. Among the five determinants, only one factor – the couples' desire number of son has positive impact on the phenomenon.

In the last fitted model, keeping constant the effects of four other variables, the risk of having 3rd birth can significantly be reduced (P<0.01) by 6% as advancement of one level in husband's education as its OR-value (0.94). One year advance in age at second delivery, the women can be free of 12% from the risk of 3rd birth in the sense that at an average a woman has 12% more risk of being 3rd birth with respect to one year earlier of her age at delivery of second live birth (P<0.01, OR=0.82). One of the most important findings in this logistic regression analysis is that very high significant risk of 3.7 times of the chance of third birth transition is observed to each increment in the couple's desire number of son as supported by its test values (P<0.01, OR=3.74) when the joint effect of other four factors in the last model is typically controlled. The ill habit of son preference effect is again reemphasized that high risk of 3rd birth phenomenon (P<0.01) can be quantified to be 45% in the previous 2nd child is female than that of male (OR=0.55). While adjusted the effects of four variables say couple's desire number of son, age at 2nd delivery, education of husband and sex of 2nd live birth, the chance of having third birth transition can be reduced by 89% (P<0.01) if the mother has been sterilized (OR=0.19).

V. Discussion

Only three independent variables are found significant on the transition of third birth in the multiple logistic regression models. It reveals that each age at second delivery (B= -0.18, P<0.01), couples' desire number of son (B=1.37, P<0.01) and sex of second live birth (B= -0.60, P<0.05) has its significant impact on the third birth transition when the joint effects of other nine factors are controlled. As an achievement of stepwise method, five factors can be detected to be determinants of third birth transition in the population. The factors are couple's desire number of son (B= 1.41, P<0.01), age at 2nd delivery (B= -0.12, P<0.01), education of husband (B= -0.06, P<0.01), sex of 2nd live birth (B= -0.60, P<0.05) and status of sterilization (B= -1.68, P>0.05). In the

last model, each of five explanatory variables may be interpreted their effects corresponding to the statistics of regression coefficient - B, P-value and OR with 95%CI when adjusted the joint effects of four other variables. The last fitted logistic regression model of the 3ʳᵈ live birth transition consists of five independent factors namely couple's desire number of son, age at 2ⁿᵈ delivery, education of husband, sex of 2ⁿᵈ live birth and status of sterilization. These five variables may be treated as the determinants of 3ʳᵈ birth transition in the population under study. In many Indian societies as the couples are educated, eagerness to restrict the family size increases. The present findings also observe the similar view. But, comparing the effects of education of husband with the wife counterpart, it is evident that the education of husband (P<0.01) plays more significant role in preventing third birth transition. It emphasized that husband's education has more consisted with decision taking of reproduction stopping particularly, of 3ʳᵈ birth transition under the condition that the effects of four significant factors – couple's desire number of son, age at 2ⁿᵈ delivery, sex of 2ⁿᵈ live birth and status of sterilization are typically controlled.

The present significant effects may include delaying age at 2ⁿᵈ delivery, reduction in the desired number of son, increase opportunities for personal advancement, awareness of social mobility and freedom from close familiarities of women outside the home and greater exposure to knowledge and favourable attitude towards family limitations. Thus, enhancement of education is supposed to result in non-familial aspiration and a greater understanding of the process and ways of controlling high fertility. This view is supported by the findings of Yadava and Sharma (2004). Again from the event-history analysis of 2000 Egyptian Demographic and Health Survey, Vignoli (2006) stresses that the difficult change in the fertility of women with high educational status seems to be responsible for the stalling fertility decline during recent years. However, the sex of the previous/ index child is demographic factor which cannot be managed by human hand. The value of the OR say 0.55 means that the risk of third birth transition is reduced about double times when the previous child is male than that of female counterpart. While adjusted the joint effects of other four variables in the last model, couple's desire number of son is also observed to be high influential factor (P<0.01) leading to third birth. It is advocated by OR value of 3.74 which indicates that the risk of third birth is increased by nearly four times corresponding to desire of one more son. It is thought to be caused by the fact that influence of son preference is high in the study population. This view is supported by Singh et al. (2007) and Singh et al. (2011). They found that the duration of waiting time to conception is significantly short as the desire number of son increases. The finding is in agreement with some other past findings too. In many developing countries, reproductive intentions and behaviours are strongly influenced by sex of surviving children. (IIPS, 2007; Hussain et al., 2000; Youssef, 2005; Khawaja and Randall, 2006) This ill behave may have retarded India's fertility decline and therefore the present fertility level is far behind the national socio-demographic goals for replacement fertility 2.1 children.

VI.   Implication

On the basis of the findings arrived in the present study it may be suggested that in order to achieve a significant reduction in the fertility level in the state, the Government of Manipur may try to formulate, execute and implement the measures viz., age at marriage be raised, couples be educated to maintain proper spacing between births and demographic disadvantage of son preference, and policies be made to increase the level of economic condition of people resulting into better way of life. Besides, there is a long way to go, to ensure the effective implementation of fertility control program associated with National Rural Health Mission (NRHM) in the state in order to achieve the basic standard for higher quality of family planning.

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31

Table - 1
ORs of variables on 3rd births transition in Multiple Logistic Regression

Variable	β	Significance level of β	OR	95%CI for OR
Residence	0.12	P>0.05	1.103	0.56-2.18
Education of husband	-0.04	P>0.05	0.957	0.91-1.01
Education of wife	-0.02	P>0.05	0.976	0.93-1.02
Family income	0.01	P>0.05	1.003	0.97-1.04
Age at marriage of husband	0.02	P>0.05	1.016	0.96-1.07
Age at marriage of wife	0.07	P>0.05	1.069	0.95-1.21
Age at 2nd delivery	-0.18	P<0.01	0.832	0.74-0.94
Desire number of son	1.37	P<0.01	3.949	1.91-8.16
Sex of 2nd live birth	-0.60	P<0.05	0.549	0.32-0.95
Status of sterilization	-1.48	P>0.05	0.229	0.04-1.33
Constant	2.17	P>0.05	8.783	

Table-2
ORs of variables on 3rd birth transition in Stepwise Logistic Regression

Step	Variable	β	Significance level of β	OR	95% CI for OR
1	Desire number of son	1.61	P<0.01	4.995	2.58- 9.67
	Constant	-2.34	P<0.01	0.096	
2	Age at 2nd delivery	-0.11	P<0.01	0.892	0.84-0.95
	Desire number of son	1.42	P<0.01	4.143	2.09-8.22
	Constant	1.43	P>0.05	4.181	
3	Education of husband	-0.05	P<0.01	0.947	0.91-0.98
	Age at 2nd delivery	-0.11	P<0.01	0.897	0.85-0.95
	Desire number of son	1.43	P<0.01	4.197	2.11-8.37
	Constant	1.59	P>0.05	4.915	
4	Education of husband	-0.06	P<0.01	0.943	0.91-0.98
	Age at 2nd delivery	-0.12	P<0.01	0.889	0.84-0.94
	Sex of 2nd live birth	-0.65	P<0.05	0.522	0.31-0.89
	Desire number of son	1.47	P<0.01	4.328	2.14-8.77
	Constant	2.16	P>0.05	8.696	
5	Education of husband	-0.06	P<0.01	0.946	0.91-0.98
	Age at 2nd delivery	-0.12	P<0.01	0.884	0.83-0.94
	Sex of 2nd live birth	-0.60	P<0.05	0.547	0.32-0.94
	Desire number of son	1.41	P<0.01	3.740	1.99-7.34
	Status of sterilization	-1.68	P<0.05	0.187	0.03-1.05
	Constant	2.44	P>0.05	11.492	