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Fertility And Rch-Status In Madhya Pradesh: A District Level Analysis

Kalyan Sundar Som and R. P. Mishra, Sagar, Madhya Pradesh

Abstract

Fertility is an important indicator of population change in our country. Madhya Pradesh, an EAG state, has extremely high fertility (MCEB 4.5 and TFR 3.45) when comparison made with the country average (2.99). The present study has been analyzed the determinants of fertility in this state. Nineteen factors have been selected for the factor analysis and then significance level of fertility determinants has been identified based on multiple regression analysis. An index of reproductive health care status has been prepared by the composite index which is mainly based on seven suitable variables. Finally, the regional pattern of RCH has been analyzed at district level.

It has been observed during this analysis that the 3rd order birth was find more prominent therefore special analysis of this segment has been made with the associated factors and components. In the study some suggestions are also given for the improvement in the present scenario which may be helpful to not only the Madhya Pradesh state but may be appropriate for such type of other states of the country. These suggestions may be helpful in the future planning to achieve the goal of sustainable development as well as millennium development goal (MDG-4 and 5).

Keywords: *determinants of fertility, antenatal care, Infant mortality, fertility equation.*

Introduction

In India, Madhya Pradesh state has started the measures of birth control to minimize the rate of population growth since 1952. But, after 60 years the birth rate and fertility rate are still high and consequently the rate of population growth is higher in comparison to the various states of the country. The high population growth since 1961 was on account of sharp declines in mortality while the present accelerated population growth is because of very high birth rate and very high fertility. The National Health Policy in 1983 had laid down specific targets for fertility reduction, which aimed at replacement level fertility by year 2000 (Gulati and Sharma). Despite concerted efforts in the form of national programmes on family planning, child survival and safe motherhood, mother and child health care, universal immunization of children, etc. which were intended to impact fertility through its crucial determinants; these have however little succeeded in curving down the fertility to the average of the country.

Government of India launched reproductive and child health status program to improve RCH status and reduced the

inequality in 1996-97 in his all states and union territory. A step ahead, GOI introduced National Rural Health Mission (NRHM, 2005) with the objective of "to promote equity, efficiency, quality and accountability of public health services through community driven approaches, decentralization and improving local governance" (MOHFW, 2005). Reduction of Infant mortality rate (IMR) and Maternal Mortality Ratio (MMR) and Total Fertility Rate (TFR) along with reduced unmeet need and universal access to public health services such as women and child health, sanitation and hygiene, immunization and nutrition services and promoting access to improved health care at household level is the principle focus of this programme (MOHFW, 2005).

However, replacement level fertility levels have been achieved in some larger states like Kerala and Tamil Nadu and smaller territories like Goa, Delhi, Chandigarh, Nagaland, Pondichery, etc (Gulati and Sharma). The medium-term objective enshrined in the National Population Policy document released in March 2000 clearly specifies that fertility must reach replacement level by 2010 through vigorous implementation of inter-sectoral operational strategies (National Population Policy, 2000). The state of Madhya Pradesh (MP) with the largest population size and highest fertility level is the focus of attention in this study.

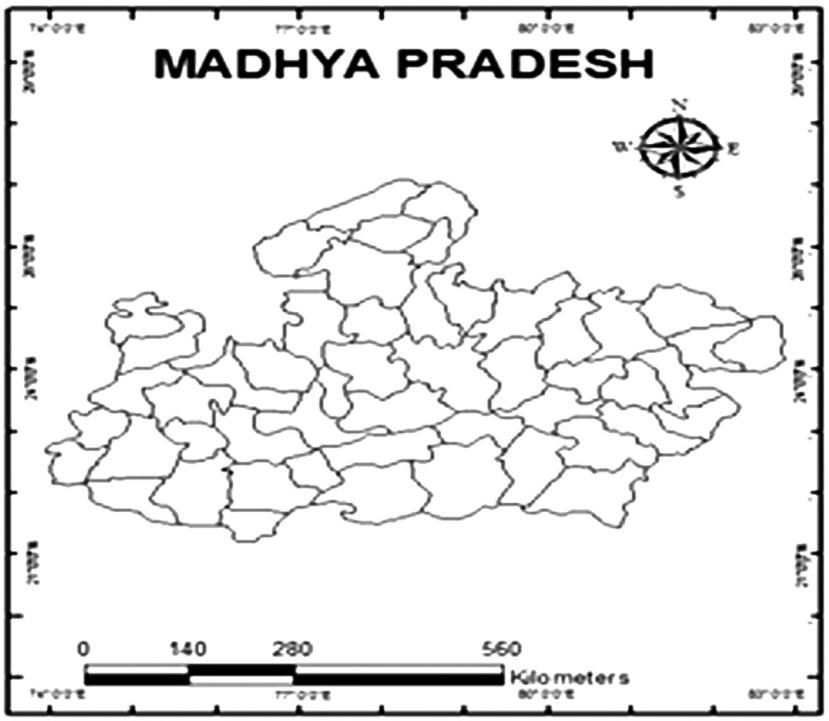
The demographic backwardness of Madhya Pradesh is characterized by some parameters such as: high fertility (TFR of 3.45) (Census 2011); relatively much higher levels of infant mortality of 65 per thousand births; maternal mortality ratio of 277 (AHS, 2011-12); lower level of contraceptive prevalence rate of 56.2%; etc. Furthermore, performance for reproductive and child health (RCH) parameters like utilization of complete antenatal care is only 8.6% compared to India's 15%, childrens' complete immunization is just 36.2% compared to India's 53%; the unmet need for contraception is 19.3% compared to India's 27%, almost completed fertility characterised by the mean children ever born to currently married women aged 40-44 years turns out to be 4.5 (IIPS, 2010).

The Study Area

Madhya Pradesh is the second largest state of the country with an area of 308245 km^2 (9.38% of total geographical area of the country). It is 7^{th} largest state in terms of its population size (7.26 million) comprising 6% of India's population, is one of the major contributors of high population growth in the country. This sate has recorded very high TFR, very high IMR, low literacy rate, high MMR and lowest contraceptive prevalence rate and lower usage of immunization service.

Objectives of the study

This study endeavor to highlights association between district level various fertility status, marriage age pattern, contraception, crucial reproductive and child health components namely antenatal care, percent of safe delivery (PDS) from institution as well as home and extent of child immunization with socio economic and cultural variables like female literacy rate and work participant rate, share of SC and ST population in the concern district, percent of females, as



Map 1: Location and Extent

well as total agricultural activities engaged population, percent of household having television and district overall economic development indicators like percent of urban population and percent of household under the BPL status.

This study presents district wise pattern of reproductive and child health status in Madhya Pradesh. This study proposes to analysis of significant factors affecting fertility variations in the districts of Madhya Pradesh.

Database and Methodology

This study is primarily based on secondary sources of data, obtained from census of India (2011), District level health survey-3 (2007-08) and Annual Health Survey of Madhya Pradesh. The whole data has processed by the use of statistical analysis programme i.e. SPSS.

With the help of factorial analysis association between fertility, marriage age pattern, contraception usage, reproductive health and child health care utilization, socio-economic profiles are established. Quantitative insight into the association and assist in selection of the germane variables for electing the districtwise composite indices is made by the factorial analysis. Through the principal component analytical technique districtwise RCH status indices have been work out. These

indices are helpful in identification of demographically sensitive districts that need to be major attention upon to convey about optimal results towards population control and stabilization which is the main aim of Indian population policy 2000. After that, predictors of district level fertility variations has been underlined and relative significance of alternate predictors are help full in the identification of responsible factors. They will be helpful in the process of bring down of the rapid population growth in the demographically backward districts of Madhya Pradesh.

Identification of the Factor Structure and Associations

Quantitative insights into the association between fertility, socio-economic demographic and reproductive and child health utilization factors are highlighted through the factorial investigations. The list and descriptive statistics of the selected variables which are used in this study is provided in Appendix -1. The number of factors retained in the analysis is four as per Kaiser's criterion of Eigen values greater than unity (Harman, 1960). The varimax rotated factor structure is presented in Table1.

Table-1: Rotated Component Matrix[a]

Variables		Factor loadings on variables				Communality
		1	2	3	4	
1	TFR	**-.833**	.287	-.126	-.013	.792
2	PBO3P	**-.871**	.108	-.168	-.055	.801
3	FLR	.571	**-.758**	.117	.040	.915
4	FWPR	.217	**.793**	-.329	-.318	.886
5	PGMB18	-.124	.216	-.129	**.839**	.782
6	PUP	.286	-.573	**.645**	.028	.827
7	SpsK	-.331	.226	**.405**	-.179	.357
8	PCUFPM	**.802**	-.057	.092	.020	.655
9	RCANC	**.799**	-.018	.367	.035	.775
10	PDS	.354	-.177	**.717**	.401	.832
11	PCWCI	**.607**	-.160	.469	-.119	.629
12	Unmeet Need	**-.879**	.022	.004	.057	.776
13	PER_SC	.007	-.237	.182	**.904**	.906
14	PER_ST	-.164	.414	-.241	**-.812**	.915
15	TEL_ENG	.466	-.408	**.673**	.185	.870
16	AGRI_ENG	-.208	**.925**	.019	.058	.902
17	AGRI_F_ENG	-.094	**.954**	.078	-.128	.941

18	BPL_PER	-.028	-.108	**-.724**	-.218	.584
19	PER_IMR	-.319	.102	**.759**	.129	.704
Eigen Values		4.791	3.430	3.923	2.555	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The factor matrix reveals that most of the variables in the scope of the influence of the present study have been duly represented in the structure. The extents of communalities vary between 0.357 for School per sq Km. (SPSK) to 0.941 for female engaged in agriculture activity (FEAA). Other reproductive and child health underlying characteristics, socio-economic characteristics are duly represented in the form of four elicited factors. The association and identification of the elicited factors are briefly discussed here as follows:

(a) The first factor (F-1) reveals that the predominant constituents of the first factor (F-1) are characteristics such as Total Fertility Rate, percent of 3+ birth order, percent of couples using family planning methods, percent of mother received complete antenatal care; percent of children with complete Immunization and percent of women have unmeet need. It also mentioned here that all the predominant constituents depicts consistent associations where some are inverse association with reproductive and child health status such as Total Fertility Rate, Percent of 3+ birth order and percent of women have unmeet; on the other hand, some are positive association such as percent of couples using family planning methods, percent of mother received complete antenatal care and Percent of children with complete Immunization. Low unmeet need and higher usage of contraceptive both are juxtapose with fertility where previous one are positively associate with fertility but other are positively association with contraception and negatively association with fertility. Antenatal care and child immunization reduce infant mortality and maternal mortality which help fall of mortality induced fertility.

(b) The underlying constituents of the second factor (F-2) depict that female with high work participant rate increasing higher reproductive health status by the women empowerment that's help to own decision regarding reproductive health. In this study it is also observed that the female literacy does shows positive impact on the reproductive status of women, however, the level of education has a more significant role in increasing the reproductive health status than literacy.

(c) The main constituents of the third factor (F-3) turn out to be PUP, SPSK, PDS, TELE_ENG, BPL_PER and PER_IMR. The districts depicting a higher percent of urban population and school per km^2 are increases awareness for reproductive health status. Higher use of telephone/ mobile means good communication that helps to contact the doctor and

also help for communicate transport facilities which helps to reach higher reproductive health status. Below poverty line population is an indicator of economic scenario of this area which has inverse relation with reproductive health status. Infant mortality rate gives a positive relation with fertility by the concept higher fertility helps to secure that some are kept with after the incident of infant death occurred.

(d) The underlying constituents of the fourth factor (F-4) depict that district with a higher percent of girls marrying below 18 (PGMB18) depict inverse association with fertility. Another way it illustrates reliable association such as fertility (PBO3P and TFR) describe a contrary association with marriage age patterns. Schedule Tribe is the most backward group of our society, they live generally in the inaccessible areas where health facility are not reach and they are not too much aware the reproductive health status.

The exact nature of associations, magnitude of effects and the relative significance of different socio-economic, demographic and technologically component on the status of reproductive health is explored in the later section through a parametric estimation of the multiple linear relations.

Parametric Estimates of Fertility Equation

The parametric estimates of the multiple regressional equation of the birth order 3 and above (pbo3+) have been presented in Table 2. Selection of the parsimony explanatory variables was partly facilitated through a scanning of the correlation matrix among the variables and also through an examination of the factor structure, which enabled accounting for the problem of multi-collinearity.

The structural analysis through the parametric estimates highlights the exact nature of linkage and the magnitudes of the effects of different explanatory variables which are considered in this study.

Table-2: Parametric Estimates of Multiple Regression Model For Fertility Equation *

Model	Unstandardized Coefficients		Standardized Coefficients	t	Level of significane
	B	Std. Error	Beta		
(Constant)	7.001	1.470		4.764	.000
FLR	**-.047**	.012	-.926	-3.941	**.001**
FWPR	**-.054**	.015	-1.224	-3.598	**.001**
PGMB18	-.006	.009	-.097	-.651	.520
PUP	**-.015**	.007	-.564	-2.187	**.038**
SpsK	-.004	.004	-.101	-1.169	.253
PCUFPM	.002	.012	.034	.174	.863
RCANC	**.007**	.005	.259	1.369	**.182**
PDS	**-.007**	.005	-.214	-1.322	**.197**

PCWCI	**.005**	.003	.184	1.424	**.166**
Unmeet Need	.016	.016	.194	.991	.331
PER_SC	**.031**	.019	.439	1.618	**.117**
PER_ST	**.008**	.005	.381	1.446	**.160**
TEL_ENG	-.002	.008	-.063	-.226	.823
AGRI_F_ENG	**.099**	.045	1.391	2.191	**.037**
BPL_PER	.003	.002	.123	1.135	.266
PER_IMR	.001	.005	.022	.178	.860

**. Dependent Variable: Total fertility rate*

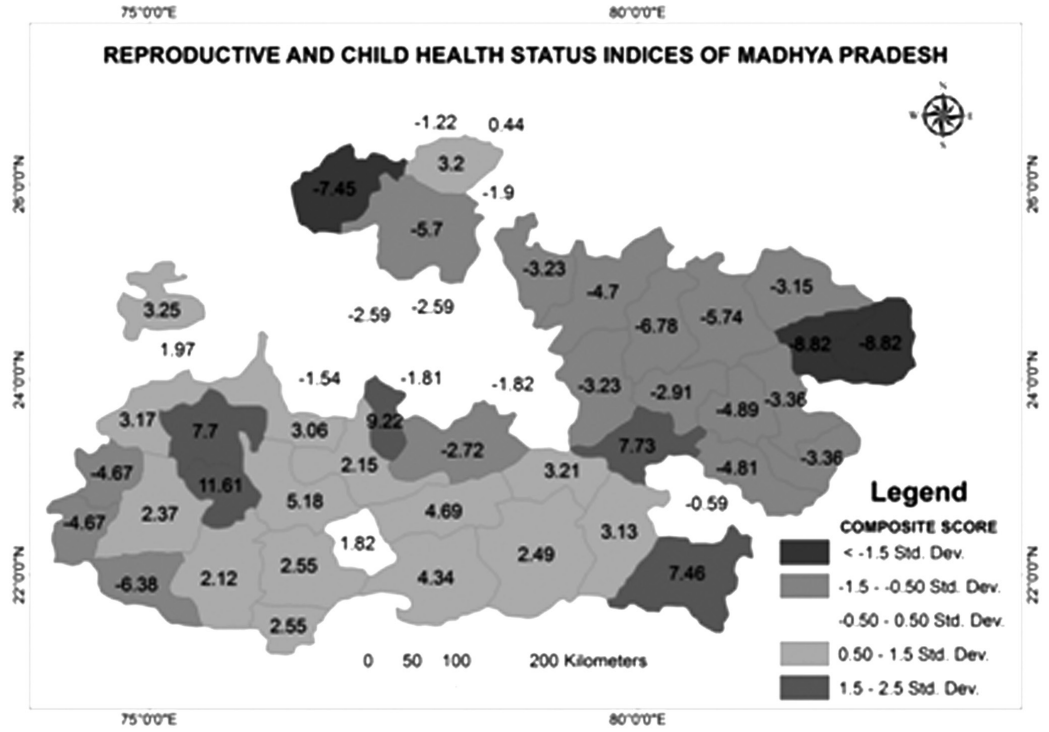
Female education and female work participant rate both considered as an indicator of women empowerment that gives birth a significant inverse relation with fertility. In high women empowerment, women are free to decide the number of child and them also aware the problem with more number of children therefore fertility is reduced among this group of population. Extent of urbanization (PUP) depicts a positive association with the utilization of delivery care or extent of safe deliveries (PSD).

Among demographic and reproductive health components it is found that percent safe deliveries signifying extent of professional attendance at the time of birth, whether in health institutions or at home, depict a significant and negative impact of fertility. Here the role of trained birth attendants for deliveries at home due to cultural considerations have often been linked with enhancement in safe deliveries amounting to reduction in maternal mortality. The extent of immunization amongst children impacting the predominantly post-neonatal component of infant mortality also depicts a significant and inhibitive impact of fertility.

District wise Reproductive and Child Health Status Indices

The factor analytical approach has been utilized for constructing the RCH- status composite indices for all the 50 district of Madhya Pradesh. For constructed reproductive and child health status, seven parsimony variables are considered which representing different aspects of reproductive and child health status outcomes. These are (i) percent of birth in last three years of birth order 3+ (PBO3P), (ii) percent of girls who have marriage before 18 years, (iii) percent of couples using family planning methods, (iv) percent of mother received complete antenatal care, (v) percent of women who had safe deliveries, (vi) percent of children with complete Immunization and (vii) infant mortality rate. The composite indices would facilitate the identification of such districts, which are demographically backward or sensitive, need special attention in the attainment of national objectives of fertility control and early population stabilization.

In Madhya Pradesh Narmada valley and Satpura region have high reproductive status indices expect the highly tribal dominated districts (Jhabua, Alirajpur and Badwani). Malwa plateau and Bundelkhand region has



Map 2: RCH Status Indices for Districts of M.P.

moderate reproductive status indices. While, Baghelkhand, Vindhyana ravine region and central Indian plateau are belongs to very low RCH status group. Top five RCH-status districts are Indore (11.61), Bhopal (9.22), Jabalpur (7.73), Ujjain (7.7) and Balaghat (7.46). On the other hand, bottom five district are Sidhi (-8.82), Singrauli (-8.82), Sheopur (-7.45), Panna (-6.78), and Barwani (-6.38). High tribal dominancy is inversely acted with RCH status and urbanization has strongly positive influence on RCH status.

Three districts are in the neglected group (>1.5 std. dev.) and sixteen districts are under privileged group (SD = 0.50-1.5) that mean thirty eight percent demographic sensitive districts needed attention on the perspective of RCH status.

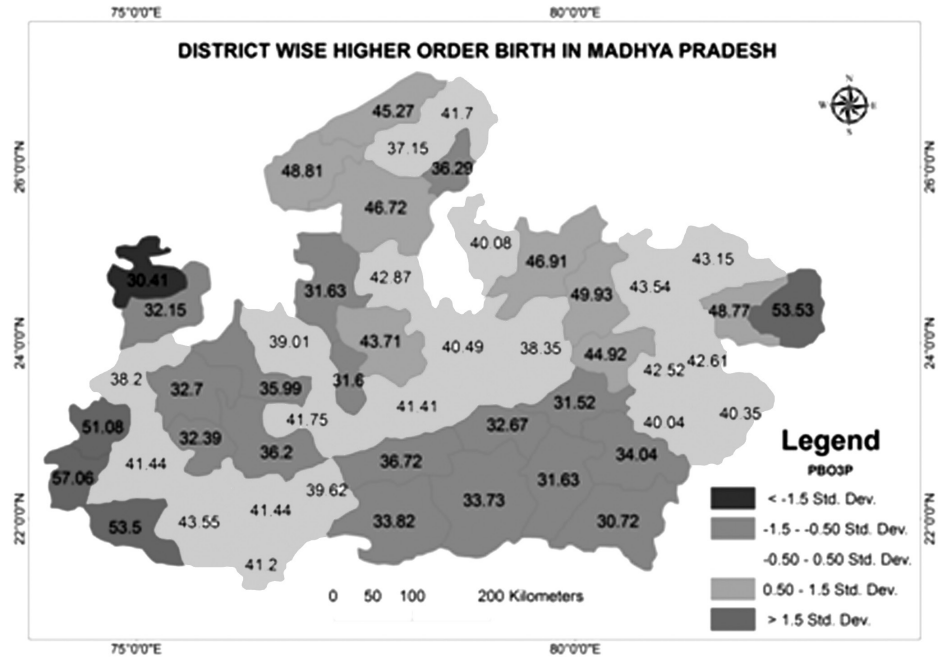
More privileged RCH status group include five districts where 15 districts are covered in the privileged group. Moderate category RCH status includes 11 districts. Under privileged group include 16 districts where 3 districts included in neglected category region.

District wise Higher Order Births

District wise profile of the percent of higher order births (PBO3P) among currently married women aged 15-49 years from RCH survey 2006-07 has been presented in Map 3 which highlights the regional configuration of fertility in Madhya Pradesh. It may be of interest to mention that most of the fertility characteristics, namely higher order births,

mean children ever born, total fertility rate and total marital fertility rate, etc. depict strong and highly significant association and correlation between them. The regional configuration of the extent of higher order birth is presented in the district level Map 3.

The district level map of higher order births (PBO3P) clearly reveals that most of the high tribal dominance districts depict much higher level fertility compared with district of Madhya Pradesh. Neemuch has secured the lowest level fertility position with 30.4 percent higher order birth. Furthermore, eastern Satpura region have low level fertility region, where Balaghat (30.72), Jabalpur (31.52), Seoni (31.63), Narsinghpur (32.67), Chhindwara (33.73) and Betul (33.82) districts are located. Four districts of very high level of fertility are Alirajpur (57.06), Singrauli (53.53), Badwani (53.5), and Jhabua (51.08).



Map 3: Districtwise Higher Order Births (PBO3P) in M.P.

It is significant to mention here that all the districts have very high proportion of tribal community from 45 to 90 percent. Another interesting fact is highly urbanized districts have low level of higher order births (i.e. Bhopal, Jabalpur, Ujjain and Indore). Four districts come under the neglected group (>1.5 std. dev.) and eight district are under privileged group (0.50-1.5 std. dev.) that mean twenty four percent districts are needed attention on the perspective of RCH status where high order birth is higher.

Conclusion

This study strongly highlights the association between fertility and RCH status with other socio-economic and demographic variables. The association between all the variables justify the general expectations, such as positive with higher IMR, female engaged in agricultural activities, high ST concentration (backward groups) and low age marriage, negative with female literacy rate, rate of urbanization, usage of contraception, antenatal care & immunization service and good communication service (percent of household have telephone/mobile service).

The factorial analysis highlighted strong interrelation between fertility, use of contraception, unmeet need, antenatal care and child immunization. Women literacy and women empowerment also depict strong interrelation with fertility and RCH care services utilization.

The female literacy rate and female work participant rate depicts a significant impact on fertility. Reproductive and child health care utilization characteristics like extent of safe deliveries and child immunization depict significant impact on fertility. Interestingly, it observed that Schedule caste and Schedule tribe group dominated districts have higher level fertility despite other important predictor in the fertility equation.

The result of this study suggests that universal accessibility of RCH services like antennal care, safe delivery, children immunization should priorities with women empowerment help to control fertility and consequently, population stabilization. Special attention on the Schedule caste and Schedule tribe dominant districts toward better utilization of RCH care and thereby fertility reduction and population stabilization is indicated.

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Kalyan Sundar Som
Junior Research Fellow (UGC)

Prof. R. P. Mishra
Professor of Geography
& Director, Planning & Res. Generation
Dr. Hari Singh Gour Central University,
Sagar, M. P., India (470003)