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Title: Contextual effects of neighbour on contraceptive use in high fertility state of India

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Lucky Singh and L. Ladu Singh

Background and objective of the study

Diverge socio-cultural practices and beliefs of a number of under-privileged communities, such as, scheduled castes (SC), scheduled tribes (ST) and other backward classes (OBC) in many north Indian states including Uttar Pradesh (UP) are mainly responsible for the lower contraceptive prevalence and persistent high fertility rates. In this context we are of the view that any intervention programme to enhance contraceptive use for state like UP should be on the basis of ground reality prevailing in the diverse communities of the state. The underlying notion is that human is a social animal and lives in communities, sharing knowledge, socio-cultural practices and common facilities. With this view in mind we proposed to integrate neighbourhood backgrounds in explaining contraceptive use. Among the neighbourhood background, neighbours standard of living and presence of other castes in the neighbour can be crucial in motivating contraceptive use. Well to do neighbours can encourage contraceptive use for limiting family size and also for health reason by sharing knowledge on advantages of small family, ways and means of contraception and providing information on public facilities available within reach with their poorer neighbours. Women of household in the lower strata of standard of living can as well try to imitate and follow the contraceptive and child bearing behaviors of their rich neighbours in the hope of climbing up in the social hierarchy. On the other hand presence of large number of other castes in the neighbour is likely to demote contraceptive use as sharing of knowledge is going to be limited due to diverse socio-cultural practices. In such a case, diffusion of practices which promote contraceptive use for limiting and health reasons would also be slower. In the light of the foregoing discussion, we felt that, any study on correlates of contraceptive use among currently married is incomplete without consideration of neighbourhood background at least in the context of Uttar Pradesh.

The state of Uttar Pradesh is most populous, sharing 16 percent of country's population. Result of the successive rounds of Indian National Family Health Surveys (NFHS) shows that there is no sign of fertility declining over time with a recent total fertility rate of 3.8 in 2005-06 (NFHS-3) as against 4.1 for 1998-99 (NFHS-2). This is mainly attributed to low contraceptive prevalence rate (CPR) in the state. CPR for any method is 43.6 percent among currently married women in Indian

NFHS-3, which is much below the corresponding national figure of 56.3 percent and it occupies sixth position from the bottom in the ranking of 29 states. This is despite of numerous interventions to promote small family norms beginning with the India Population Projects (IPP-I; IPP-II and IPP-VI) assisted by the World Bank to the recent USAID sponsored SIFPSA project down to World Bank sponsored RCH project. The prevailing scenario of one among the lowest CPR and persistently high fertility rate in Uttar Pradesh sends a save our soul (SOS) message for a fresh look into the correlates of contraceptive use. In this paper an attempt is made to provide a fresh look into the social determinates of contraceptive use integrating neighbourhood background which can capture ground reality prevailing in Uttar Pradesh.

Data and Methods

For the analysis purpose, data from District Level Household Survey under the Reproductive and Child Health (DLHS-RCH-II, 2002-2004) conducted in all the states of India is taken into consideration. Details of the sampling design and questionnaire canvassed in this survey can be found in IIPS-RCH (2006). Besides this we have also used district-level data on percentage of female literacy and percentage of urban population from the Census of India, 2001.

In order to integrate affluent neighbors in the community, we have computed mean standard of living of all other households in each primary sampling unit (PSU) excluding the index women's household. The household standard of living index for each household is calculated from DLHS-RCH-II data considering the same of assets and items and corresponding weights used in the computation of SLI in DLHS-RCH-II. As for the consideration of non-aligned castes we have computed for each PSU the proportion of households which belongs to castes not same as that of the household of the index women. In DLHS-RCH-II, PSUs are either a village or a part of it in rural areas and a census enumeration block (CEB) in urban areas.

Dependent variable is the contraceptive status of currently married non-pregnant women in the age group 15-44 years coded in dichotomous categories, 1 for current contraceptive users and 0 for non-users. Age of the woman, literacy status of women, place of residence, household SLI, number of surviving sons, are included as individual level background while at the community (PSU) level average SLI of neighbours, proportion of other castes' household, different from that of the index women are included in the study. At district level, we have integrated percentage of urban population, female literacy and percentage of ST and SC population. Table 1 gives detail description of both dependent and independent variables included in this study.

Table 1: Definition and classification of variables used in the analysis

Variables	Description of variables
Age of the women	Age of the respondent at the time of survey in completed years
Women Education	Educational status of the respondent
Place of residence	Place of residence of the respondent
Standard of living index (SLI)	Proxy for economic status of respondent's household
Number of surviving sons	Total number of surviving sons of the respondent at the time of survey
Neighborhood average SLI	Average SLI of the neighbors in the PSU excluding respondent's household
Proportion of other castes	Proportion of other castes in the PSU different from the respondent's caste
Percentage of SC and ST	Percentage of SC and ST population at district level
Percentage of Urban	Percentage of Urban population at district level
Percentage of female literacy	Percentage of female literacy at district level
Contraceptive use	Respondents current contraceptive status

A three level multilevel model is used for analysis considering women within PSUs and PSUs within districts as lowest to highest levels. Multilevel hierarchical nested analysis is more suitable in view of the statistical complications arising from the hierarchical or nested structure of the requisite data sets, i.e. individual observations (women) are organized into larger units or clusters (PSU) , which , in turn , may be grouped into still larger (District). The set of explanatory variables typically includes those that refer to individuals as well as those that describe the larger units, since observations from the same cluster tend to be more alike than observations from different clusters, the classical assumption of independence between observations is likely to be violated. As a consequence, statistical methods that ignore the nesting structure of the data are almost certain to underestimate the variance of the estimated coefficients.

In this paper, contraceptive use status of currently married non- pregnant woman of i^{th} line number, in the j^{th} PSU and k^{th} district is denoted by y_{ijk}, the binary response coded as '1' if a woman is currently using any contraceptive method and '0' otherwise.

This dichotomized variable was then used as the dependent variable in the analysis.

If $\pi_{ijk} = P(y_{ijk}=1)$ then the three level logistic model can be written as:

$$\mathbf{y_{ijk}=\pi_{ijk}+e_{ijk}},$$

Where, $$\mathbf{logit\ (\pi_{ijk})=\beta_{1jk}+\Sigma\ \beta_{ijk}\ X_{ijk},}$$

and, $$\mathbf{\beta_{1jk}=const+v_{1k}+u_{1jk},}$$

$\mathbf{v_{1k}} \sim N(0, \Omega_v)$ and $\mathbf{u_{1jk}} \sim N(0, \Omega_U)$.

In order to select model from other alternative competing models, a summary statistic is included in the form of -2loglikelihood. This summary statistic provides a means for assessment of improvement or otherwise of incorporating additional explanatory variables into the base models is the χ^2 statistic with degree of freedom equal to the difference in the number of explanatory variables.

Salient Finding:

This paper attempts to have a fresh look at the contraceptive behavior of the most populous state of Uttar Pradesh using the rich district level DLHS-RCH-II data and community level neighbourhood effects of affluent households and presence of other castes different from that of the household of the women. Interestingly we have found that women in communities with affluent neighbors are more likely to use contraceptives. This clearly shows the benefit of living in affluent communities as the sharing of knowledge and diffusion of contraceptive behavior is more conducive in such communities. It is encouraging to note that this relationship is statistically significant. The presence of other non-aligned castes in the communities is found to be a barrier for promotion of contraceptive use, the reason as mention before is the possibility of limited interaction and sharing of knowledge among socio-culturally diverse groups in the communities but this is not statistically significant. The other important finding of the study is that once the neighborhood well being and presence of other non-aligned castes are statistically controlled the importance of urban areas serving as cushion for enhancement of contraceptive use is lost.