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Determinants of Large Family Size in the Context of Fertility in India: Evidence from District Level Household Survey Data

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Abstract

Notwithstanding the interminably continuing family planning programmes, population of India burgeoned to reach 1210 million in 2011. Four of the most populous states in India, Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan, have decadal growth rates in the range of 20-25 percent, which is among the highest in the country. Future of reduction in population growth in India depends hugely on the reduction of population growth in these four states. This paper explores the socio-demographic determinants of women with more than two children (large family size) in these four states. The unit level data for women collected through District Level Household Survey (DLHS), Round-3 (2007-08) is used for this study. The analysis shows that women with low educational status, employed as laborers, women with lower age at consummation of marriage and women with unmet need of limiting family planning methods have higher chances of having a large family size. In this regard, the government policy should be more focused toward education of girls and stringent rules to adhere to the legal age at marriage. It is also essential to strengthen the health care delivery system to meet the unmet need of contraception to help couples to achieve a desired family size and thereby reducing the total fertility rates in these states.

Keywords: India, Large family size, DLHS-3, Unmet need, Female education.

AMS Classification: 62-02.

1. Introduction

Population of India stands at 1.2 billion according to the latest census, 2011, of India. India still is the second most populous country in the world and would overtake China to the top in the near future provided China' population policy would not change drastically (Haub and Gribble, 2011). The population of some of the bigger states in India has populations as big as some of the most populous countries of the world, e.g. the population of Uttar Pradesh is 199.6 million, which is more than the population Pakistan, the 6th most populous country in the world. The growth of population as an issue was identified even during the pre-independence period in the country. India is the first developing country to pronounce a population policy to reduce its population growth, soon after its independence, in 1952. Some of the states of the country were able reduce the fertility and thereby reduce the growth rates considerably, while some states still have high fertility rates. Eight states out of the 36 states and union territories of India constitutes about two third of the total population of India (RGI, 2011). The most populous state Uttar Pradesh contribute to about 16 .49% of the population, followed by the states of Maharashtra (9.3%), Bihar (8.6%), West Bengal (7.55%), Andhra Pradesh (7%), Madhya Pradesh (6%), Tamil Nadu (5.96%) and Rajasthan (5.67%). Of the 8 states, Uttar Pradesh (UP), Bihar, Madhya Pradesh (MP) and Rajasthan, have decadal growth rates higher than the national average (17.64%). In these four states, the decadal growth rates were above 20% i.e., UP (20.09%), Bihar (25.07%), MP (20.3%) and Rajasthan (21.44%), contribute to about 36.7 % of the total population in India (RGI, 2011) while in 2001 census this percentage was around 35.5 %. It is also interesting to note that decadal growth rates of all other states combined except these four states was 15.53% and was 2 percentage points below the national average decadal growth rate (RGI, 2011).

The total fertility rates (TFR) of India in the early 1950s was 5.9 (Haub and Gribble, 2011). Over the years, the TFR of the country declined, catching up with the replacement level of TFR (2.1). Many states of the country have reached a level of replacement level fertility over the years, effectively contributing to the decline in population growth of the country. The estimated TFR for India in 2017 was 2.2; at the state level TFR varies from 1.5 in Delhi to 3.2 in Bihar (RGI 2017). It is not surprising to note that among the bigger states Bihar (3.2), UP (3.0), MP (2.7) and Rajasthan (2.6) has the highest TFR. These four state states

have been hogging the heist rank in total fertility rates for a long time. During the period 2005-2007 the TFR of Uttar Pradesh (4.1), Bihar (4.0), Madhya Pradesh (3.5) and Rajasthan (3.5) were the highest in the country (RGI 2017). The future of reduction in the national population growth levels and the TFR depends hugely on the changes in the fertility patters of these four states of the country. In order to device interventions to reduce the fertility, it is necessary to understand the factors contributing to high fertility. This study attempts to explore the determinants of women having more than two children in the states of UP, Bihar, MP and Rajasthan.

The District Level Household Survey (DLHS) in India provides such an avenue to explore the plausible factors contributing to women having more than two children in these four states. So far four rounds of DLHS were conducted in India, the latest round being conducted during the period 2012-2014. Unfortunately, these four states were not included in the DLHS fourth round. The data available for our analysis in this regards comes from the 3rd round of DLHS that was conducted during 2007-2008. It is evident form the literature that the bottlenecks of high fertility rates have not changed much over the years in India. The United Nations population division reports on Contraceptive use shows that the contraceptive prevalence rate is more or less similar in the period 2007-2008 (54.8%) and 2015-2016 (53.5%) (United Nations 2018)

2. Data and Methods

The data for this study is from District Level Household Survey (round 3, 2007-2008) (DLHS -3). DLHS-3 is a cross sectional survey designed to provide estimates on maternal and child health, family planning, other reproductive health indicators and information on the programmes related with National Rural Health Mission (NRHM). The International Institute for Population Sciences (IIPS) was designated to carry out the survey for the Ministry of Health and Family Welfare, Government of India. It interviewed ever-married women (15-49 years) and unmarried women of the age group 15-24 years for individual level data. Information was also collected on the household, Village and the health facilities using separate structured questionnaires. The survey covered all the districts of the country, except for districts of Nagaland, covering a total of 7,20,320 households, 6,43,994 ever married women aged 15-49 years and 1,66,620

unmarried women aged 15-24 years of age. A multi stage sampling procedure was used for this survey.

For this study, we used the ever-married women (aged 15-49 years) data file of the states of UP, Bihar, MP and Rajasthan. Women having at least one live birth are considered for this study. Those women having more than two children are considered as "large family". Misreporting of ages in the survey in India is well documented. DLHS-3 also is no better in terms of age misreporting (Borkotoky and Unisa, 2014). Examining the age at marriage, we found that in some reported cases, age at marriages were less than 10 years. Similarly, for the related variable 'age at living with the husband' also had, many reporting ages less than 10 years. Discounting for the possibility of child marriage and to evade the possible misreported data, the study considered only women who have started living with their husbands at an age older than 10 years. Henceforth the selected women for the study, ever-married women with at least one live birth who has started living with their husbands after the age of 10, would be referred to as, just, women for our study.

2.1. Analytical Techniques

To study the determinants of large family size, this study used frequency tables, cross tabulations and logistic regression model. In the logistic regression model, the dichotomous dependent variable used was women with > two children/ women <=2 children. Those women having no children were not considered in this study. The independent variables considered for the study were place of residence, caste group, age at living with the husband, Educational status of the women, educational status of the husband, employment status of the women, household possession of the BPL card, Wealth Index, unmet need of the limiting method and unmet need for the spacing method. Analysis was done with the help of SPSS version 20.0 and Microsoft Excel 2007.

3. Results

3.1. Socio demographic characteristics

In all the four states, most of the women live in the rural areas. Bihar (91.0 %) has the highest percentage of the women living in the rural areas followed by UP (82.0%), Rajasthan (79.7%) and MP (77.2%). More than 15% of the women hail

from Scheduled caste households; in these four states; highest in Bihar with 20.4% and lowest in MP with 15.3%. There is a marked difference in the case of proportion of scheduled tribe among these states. While MP has 24% and Rajasthan has 15.8% scheduled tribe households, the corresponding percentage for Bihar and UP were 2.1% and 1.4% respectively (Table A in Appendix). One-fourth of the women in MP hail from household that falls in the poorest quintile, however 40.7% of the women are from the household that possess a BPL card. In the state of Bihar the corresponding percentages are 30.2% and 26.6%. For UP and Rajasthan the percentage of households in the poorest quintile are 20.1% and 27.4% and the respective percentages of households possessing BPL cards are 30.2% and 26.6%.

Education and employment of the women plays an important role in the fertility choices and patterns. Almost 73% of the women from Bihar and Rajasthan have either not attended the school or have had less than 4 years of schooling. In the case of UP and MP the corresponding percentages were 66.4% and 63.6%. The percentage of women educated for more than 15 years is very less in these states; UP (3.1%), MP (3.0%), Rajasthan (2.5%) and Bihar (1.2%). More than half of the women in UP (55.3%) and Bihar (51.3%) are not employed, the corresponding percentage for Rajasthan and MP were 47.2% and 44.3%. Agriculture is the most prominent sector of employment for the women of these states. The most prominent employment in Bihar is 'Agricultural laborer' with 29.5% of the women involved this job. In Rajasthan (24.5%) and UP (22.5%) the most prominent employment for women is 'cultivators'. In MP 'laborers' constitute largest employment group among women with a share of 18.6%. Illiteracy is found significantly lower in the case of the husbands. In Bihar, around 42% of the husbands are either not attended the school or have had less the 4 years of schooling, the respective percentages for MP, Rajasthan and UP are 34.8%, 34.9% and 31.6%.

Unmet need for family planning methods is critical indicator affecting the actualized fertility of women. The unmet need for limiting methods is on the higher side than as compared to the unmet need for spacing in all of the four states. Bihar (24.4%) and UP (23.4%) has a very high unmet need for liming methods as compared to the states of MP (11%) and Rajasthan (10.7%). In the case of spacing too, Bihar (12.7%) has the highest percentage of unmet need followed by UP (9.9%), MP (7.3%) and Rajasthan (6.8%).

3.2. Women with large families

As indicted in the section 2, the women who have more than two children are considered "women with large families". In all the four states, more than sixty percent of the women considered for the study have large families. UP with 70.6 % percentage leads the way closely followed by Bihar (69.4%), MP (64.5%) and Rajasthan (63.5%). The mean number of children also follows the same order with UP on the top with 4.02 children followed by Bihar (3.85), MP (3.46) and Rajasthan (3.36). There is a rural-urban differential in percentage of women with large families. In all the four states the percentage of the women with large families are more in the rural areas as compared to the urban areas. The gap between rural and urban areas is the lowest in the state of UP where the difference in the percentage points is 5.1% (71.5% in rural against 66.4% in urban) and maximum is in the state of MP where the gap is 9.1 percentage points (66.6% against 57.5%). (Table B in Appendix).

In Bihar and UP, more than 80% of the women in the age groups 30-34 years and above have large families. For the same age groups the percentage of women with large families is at a lower level in MP and Rajasthan. In Bihar, more than 90% of the women in the age groups 35-39 years and above have large families. In UP more than 90% of women in the age group of 40-44 years and 45-49 years have large families whereas in the case of women in the age group 35-39 the percentage is 89.1% (Figure 1).

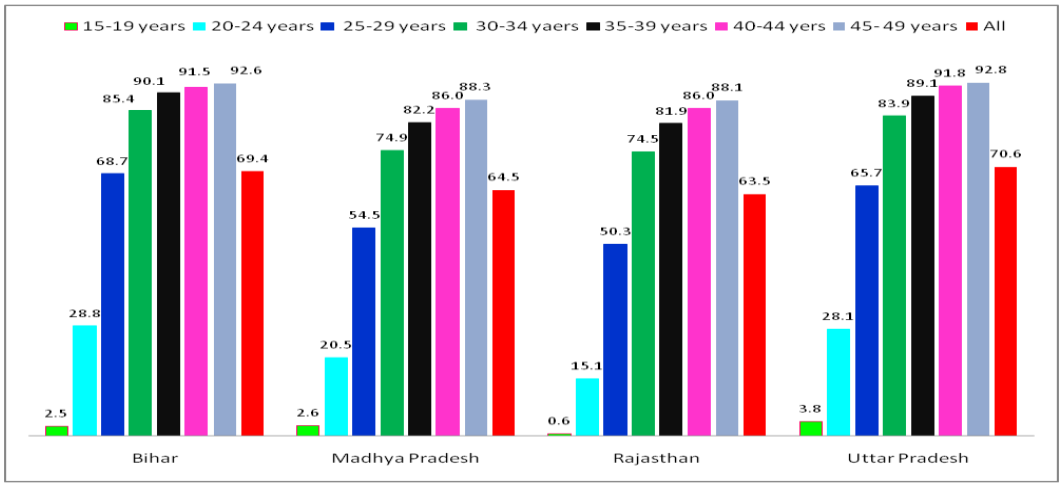

Figure 1: Percentage of women with more than 2 children in each of the 5 year age groups

In all four states, the women belonging to the scheduled caste has a higher percentage of large families as compared to their counterparts of the other caste groups. In UP, this parentage is as high as 73.6%. 'Other backward class' has a slightly lower percentage of women with large families than the schedules caste. In the case of MP and Rajasthan the percentage of large families for the 'other backward class' women are lesser than both the Scheduled caste and Scheduled tribe women. In all the four states, the women in the group 'none of them/Others' has the lowest percentage of large families (Table B in the Appendix). In all the four states, it could be noticed that as the wealth increases the percentage of women with more large families' decreases. The richest quintile of MP (48.8%) has the lowest percentage of women with large families and the poorest quintile of UP (77.4%) has the highest percentage of women with large families. Along the same lines, the households with BPL card have a higher percentage of women with large families as compared to the households with no BPL card, this holds true for all the states (Table B in the Appendix).

In the case of education of women and their husbands, all the four states show a similar pattern; as the educational status goes up the percentage of women with large families goes down. Among the women who have neither gone to school and nor have completed 4 years of schooling, the percentage of women with large families is highest in UP (78.7%) and the lowest for the same educational status is in Rajasthan (71.4%). In the case higher education, with more than 15 years or more schooling, women with large families ranges from 18.2% in Rajasthan to 34.1% in Bihar. In UP, 80% of the women whose husbands have neither gone to school and nor have completed 4 years of schooling has large families, which is the highest percentage among all the states. The lowest percentage women with large families are recorded for the women of MP (39.4%) whose husbands have had at least 15 years of schooling (Table B in the Appendix).

It is interesting to note that percentage of women with large families is the lowest among the unemployed women in the states of Bihar, Rajasthan and UP. Women employed as 'agricultural laborers' in Bihar (78.3%) and UP (84.5%) has the highest percentage of large families as compared to any other groups under employment status whereas in MP and Rajasthan the highest percentage of women with large families are among the 'laborers' category; the respective percentages are 73.6% and 72.8% (Table B in Appendix). The percentage of women with large families among the women who have an unmet need for spacing method varies between 20.9% in Rajasthan to 31.7% in UP. On the other hand, in the case of women with the unmet need for limiting method, the percentage of women with large families is more in Bihar (85.6%) followed by UP (85%), Rajasthan (72.4%) and MP(70.4%)(Table B in the Appendix).

A binary logistic regression model was applied to assess the effect of socio demographic factors on women having large families for the state of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh separately. The study considered the independent variables - type of locality, the caste, the wealth index of the household, the status of the possession of the BPL card, The age of the women living with the husband, the educational status of the woman, the educational status of the spouse, employment status of the women, the unmet need for spacing and the unmet need for limiting methods (Table-1). The results of the study for each of the four states are discussed in the following sub-sections.

Table 1: Determinants of large family size results from binary logistic regression

Variables		**Bihar**	**Madhya Pradesh**	**Rajasthan**	**Uttar Pradesh**
		Odds Ratio (95% CI)			
Locality	Urban	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Rural	1.203*** (1.098-1.318)	1.227*** (1.146-1.314)	1.245*** (1.155-1.343)	1.303*** (1.236-1.374)
Caste group	Scheduled caste	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Scheduled tribe	.823*** (.694-.976)	.871*** (.806-.942)	.869*** (.796-.948)	.856** (.735-.996)
	Other backward class	1.156*** (1.084-1.232)	.835*** (.780-.895)	.866*** (.808-.929)	1.047 (.997-1.100)
	none of them/others	1.223*** (1.124-1.332)	.991 (.910-1.078)	1.108 (1.018-1.207)	1.361*** (1.281-1.445)
Age at living with the husband		.898*** (.889-.907)	.853*** (.845-.862)	.920*** (.911-.930)	.869*** (.863-.876)
Education of the respondent	Not gone to school and under 4 years of education	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	4 to 9 years of schooling	.665*** (.621-.713)	.490*** (.463-.519)	.419*** (.392-.448)	.532*** (.508-.557)
	10 to 14 years of schooling	.379*** (.344-.418)	.260*** (.234-.290)	.222*** (.197-.251)	.307*** (.286-.329)
	More than 15 years of schooling	.201*** (.161-.252)	.154*** (.129-.184)	.100*** (.082-.123)	.146*** (.130-.165)
Education of the husband	Not gone to school and under 4 years of education	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	4 to 9 years of schooling	.902*** (.848-.961)	.723*** (.682-.767)	.644*** (.606-.684)	.803*** (.765-.842)

	10 to 14 years of schooling	1.040 (.964-1.122)	.733 (.678-.793)	.581 (.537-.628)	.842*** (.795-.891)
	More than 15 years of schooling	1.137** (1.014-1.275)	.689*** (.613-.773)	.504*** (.451-.562)	.769*** (.710-.834)
	Don't Know	.620*** (.518-.743)	.617*** (.489-.778)	.370*** (.214-.640)	.629*** (.492-.805)
Employment status of the respondent	Not employed	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Cultivators	1.750*** (1.607-1.906)	1.015 (.933-1.103)	1.134*** (1.064-1.208)	1.856*** (1.767-1.948)
	agricultural laborer	1.749 (1.639-1.867)	1.207*** (1.123-1.297)	1.199*** (1.097-1.310)	2.212*** (2.068-2.366)
	tailors, dress makers, sewers, upholsterers & related worker	1.238* (.982-1.560)	.963 (.770-1.205)	1.394*** (1.149-1.692)	1.276*** (1.124-1.450)
	Laborers	1.542*** (1.239-1.920)	1.299 (1.209-1.397)	1.256*** (1.158-1.363)	1.861*** (1.599-2.166)
	Farmers other than cultivators		1.467*** (1.300-1.654)		
	All other jobs	1.694*** (1.530-1.875)	1.649*** (1.493-1.821)	1.349*** (1.193-1.525)	1.903*** (1.757-2.063)
Possess BPL card	Yes	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	No	.909*** (.859-.961)	.954* (.909-1.002)	.915** (.858-.976)	.940** (.901-.981)
	don't know	.788 (.574-1.082)	.657** (.495-.873)	.834 (.572-1.216)	.945 (.714-1.251)
Wealth index quintiles	Poorest	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	Second	1.028 (.967-1.094)	.982 (.919-1.048)	1.040 (.962-1.124)	1.022 (.963-1.084)
	Middle	1.080* (.999-1.168)	1.017 (.943-1.098)	1.076* (.994-1.166)	1.095** (1.032-1.163)
	Fourth	1.240*** (1.125-1.367)	.992 (.909-1.082)	1.109** (1.016-1.211)	1.083** (1.017-1.153)
	Richest	1.064 (.929-1.219)	1.210*** (1.086-1.347)	1.362*** (1.217-1.525)	1.223*** (1.136-1.316)
Unmet need of spacing method	Yes	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	No	6.416*** (5.987-6.875)	7.421*** (6.748-8.161)	6.938*** (6.246-7.706)	5.676*** (5.365-6.005)
Unmet need of limiting method	Yes	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
	No	.440*** (.413-.469)	.852*** (.792-.917)	.758*** (.700-.821)	.463*** (.441-.486)
Constant		4.593	8.226	2.775	10.951

*** if p<0.001, ** if p>0.01 and p<0.05 and * if p>0.05 and p<0.10

3.2.1. Bihar

Women in the rural areas have 20% more chance of having large families than their counterparts in the urban areas. The women of the Scheduled tribes have around 18% less chance, women belonging to 'other backward class' have a 15.6% more chance and women belonging to the group 'none of the them/others' have a 22.3% more chance of having large families as compared to the women belonging to the scheduled caste. 'Age at living with the husband' is an important predictor for the number of children a women will have; as this age of women increases by one year the chance of having a large family gets reduced by around 10%.

As the years of education of the women increases the chances of having a large family declines. Women who are educated more than 15 years have an 80% less chance of having large families as compared to the women who have not gone to school or have less than four years of schooling. However, education of the husband though significant gives a different picture; women's husbands who have 4-9 years of education have a 10% less chance and women's whose husbands have an education of 15 years or more have a 13.7% more chance of having large families as compared to the women whose husbands have either not gone to school or have less than 4 years or schooling.

It is interesting to note that women who are unemployed have a lesser chance of having a large family than the women who are employed. Normally low fertility is associated with women's participation in the workforce (Majumder and Ram, 2015), however this study's results contradicts it. The women of the households with no BPL card have around 9% less chance of having large families as compared to women of the households with a BPL card. Looking at the wealth index, it is interesting to note that only one quintile shows statistical significance; the women belonging to the fourth quintile have a 24% more chance of having large families as compared to the women of the poorest quintile.

In the model we have used two unmet need for family planning, viz. spacing and limiting. The model shows a contradictory result. Women who do not have an unmet need for spacing method have 6.4 times more chances of having large families as compared to the women have unmet need for spacing methods. On the other hand, women who do not have an unmet need for limiting methods have a 56% less chance of having a large family as compared to the women who have unmet need for limiting methods. This result could be owing to the fact that most

of the women who have an unmet need for spacing belong to the younger age groups and are yet to realize their desired family size. On the other hand most of the women who have an unmet need for limiting belong to the older age groups and who have already achieved their desired family size.

3.2.2. Madhya Pradesh

In MP, the women of the rural areas have a 22.7% more chance of having large families than women in urban areas. Women of the Scheduled caste have a higher chance of having large families as compared to all other caste groups in the states. Similar to Bihar, an increase in the 'age at women living with husband' is an important predictor; an increase in one year reduces the chance of having a large family by around 14.7% percentage points.

As the years of education of the women increases the chances of having large families declines. Women who are educated for 'more than 15 years' have around 85% less chance of having large families as compared to the women 'who have not gone to school or have only less than four years of schooling'. Unlike in the case of Bihar, the education of the husband also show a similar trend as the education of the women themselves in the case of MP ; however the percentage reduction in the chances are not as dramatic as in the case of the education of the women.

Similar to the case in Bihar, unemployed women in MP too have a lesser chance of having large families than the women who are employed. When we take into consideration the wealth index, only the richest quintile shows a statistical significant value; the women belonging to the richest quintile have a 21% a large family as compared to the women of the poorest quintile. Like in the case of Bihar unmet need for spacing and unmet need for limiting gives opposing results for MP too. Women who do not have an unmet need for spacing method have 7.4 times more chances of having large families as compared to the women who have an unmet need for spacing methods. On the other hand women who do not have unmet need for limiting methods have around 15% less chances of having large families as compared to the women who have an unmet need for limiting methods.

3.2.3. Rajasthan

Women in rural areas of Rajasthan have about 25% higher chance of having a large family as compared to the women in urban areas. Women of the Scheduled

caste households have a higher chance of having large families as compared to women in the Scheduled tribe and 'other backward caste' households.

Similar to Bihar and MP, an increase in the 'age of women starting to live with husband' is an important predictor in the number of children a woman have in Rajasthan too. As the age of the women at the start of living with her husband increases by one year the chance of having more than two children gets reduced by 8 percentage points, which is lower than in the case of the other three states.

As in the case of MP, as the years of education of the women and their husband increases the chances of having a large family declines. Women who are educated more than 15 years have a 90% less chance of having a large family as compared to the women who have not gone to school or have only less than four years of schooling. Similar to the case in Bihar and MP, unemployed women in Rajasthan too have a lesser chance of having a large family than the women who are employed. The women of the households with no BPL card have only around 8.5% less chance of having a large family as compared to women of the households who have a BPL card. When we take into consideration the wealth index, the fourth and the richest quintiles show a statistical significant value; the women belonging to the fourth and the richest quintiles have a 10.9% and 36.2%, respectively, higher chance of having large families as compared to the women of the poorest quintile.

Like in the case of Bihar and MP unmet need for spacing and unmet need for limiting gives contrasting results for Rajasthan too. Women who do not have an unmet need for spacing method have almost 7 times more chances of having large families than the women who have an unmet need for spacing methods. On the other hand a women who do not have unmet need for limiting methods have around 24.2% less chances of having a large family as compared to the women who have an unmet need for limiting methods.

3.2.4. Uttar Pradesh

The women of rural areas of UP have 30.3% more chance of having a large family than urban women of the state. Women of the Scheduled caste households have a higher chance of having a large family as compared to women in the Scheduled tribe households. Women belonging to the caste group ‘none of them/others’ have a 36.1% higher chance of having large families as compared to the women of the scheduled caste households. Similar to all the other three states, an increase in the

'age at living with husband' is an important predictor in the number of children a woman have in UP too; an increase by one year reduced the chance of having a large family by 13.1 percentage points.

As in the case of MP and Rajasthan, as the years of education of the women and their husband increases the chances of having a large family declines. The reduction in chances of having a large family with education is more prominent in the case of women's education as compared to the education of their husbands. Women who are educated more than 15 years have a 85.4% less chance of having a large family as compared to the women who have not gone to school or have only less than four years of schooling; in the case of the husband's education the corresponding percentage is only 23.1%.

Similar to the case of the other three states, unemployed women in UP too have a lesser chance of having a large family than the women who are employed. The women of the households with no BPL card have only around 6% less chance of having large families as compared to women of the households which holds a BPL card. When we take into consideration the wealth index, the middle, the fourth and the richest quintiles show statistical significant values; the women belonging to the middle, the fourth and the richest quintiles have a 9.5%, 8.3% and 22.3%, respectively, higher chance of having large families as compared to the women of the poorest quintile.

Similar to the other three states unmet need for spacing and unmet need for limiting gives opposing results for UP too. Women who do not have an unmet need for spacing method have almost 5.7 times more chance of having large families as compared to the women who have unmet need for spacing methods. On the other hand women who do not have unmet need for limiting methods have a 53.7% less chance of having large families as compared to the women who have an unmet need for limiting methods.

4. Discussion and Conclusion

This paper explores the effect of various socio economic and demographic variables on women having large families in the states of UP, Bihar, MP and Rajasthan.

The relationship of women's education and small family size has been well documented (Mutharayappa, et al., 1997; Zachariah, 1984). In our study too, the impact of women's education on the family size is very strong. In all the four states as the education the women increases the chances of having large families reduces dramatically. In the case of women who had more than 15 years of schooling have around 80% to 90% less chances of having large families as compared to the women who have not gone to school or have less than 4 years of schooling.

The unmet need is a very strong determinant to achieve a desired family size. For this study we have used two unmet needs for family planning, i.e. unmet need for spacing methods and unmet need for limiting methods. The effect of these two unmet needs show opposing results for all the four states. While the unmet need to spacing have a very negative effect on the family size the unmet need for limiting shows a positive effect in the family size.

The age at marriage and the consummation of marriage is an important factor which determines the effective reproductive span of a woman and thereby has a very direct effect on the fertility pattern of a population. This study shows that as the age of consummation marriage increases the chances of having large family size decreases.

The urban rural differentials in the study in the fertility level shows that given all the other factors in the model remains the same, women of the rural areas have higher chances of having large families. Research shows that living in rural areas could in fact be associated with lower fertility than living in urban areas have been very rare (Trovato and Grindstaff, 1980).

The effect of caste group on the family size in each of the state is different; however in all the four states women belonging to the scheduled tribe households have lesser chances of having a large family size as compared to the women belonging to the scheduled caste women. Earlier research has shown that women belonging to the scheduled caste and scheduled tribe have higher fertility as compared to the other caste groups (Ramesh, 2007). In the state of Bihar women belonging to the other backward class and the group 'none of them/other' have higher chances of having large families as compared to their counterparts belonging to scheduled castes. For Rajasthan and UP this holds true for 'none of them/other'. In this regard, the effect of caste groups needs to explored within the different cultural milieu to elicit more knowledge of its interplay with fertility.

In the case of the relationship between large families and female employment; women who are unemployed have a lesser chance of having large families than the women who are employed. Generally low fertility is associated with women's participation in the workforce (Majumder and Ram, 2015). In these four states, most of the women who are employed are in agriculture or work as laborers and more than 60% of the women have either not gone to the school or have gone to school for less than 4 years. The women in white collar jobs are extremely rare in these states. Further investigation reveal that the women who are in work force are poorer than the women who are not employed, except for the women who are 'tailors, dress makers, sewers, upholsterers and related workers'. On the other hand, apart from Bihar in all the other states more or less 50 percent of the unemployed women are either from the fourth of fifth quintal of the wealth index. In other words the participation in the workforce is more a sign of poverty than female empowerment.

It is interesting to note that controlling for all other factors the effect of wealth on fertility is not very significant. The families that possess BPL card, though significant, have only a small effect on the chances of having a large family in comparison to the families that do not have a BPL card. Earlier researches also point to the fact that effect on poverty on fertility is not very significant (Mohanty, 2009).

As it has been established time and again that 'Women's education', 'The age of consummation of marriage' and 'The unmet need for liming methods' have a telling effect on family size; given all other factors remain the same. It is high time the government agencies revisits the basics and put more efforts on female education, strict implementation of the legal age at marriages and increasing the quality and accessibility of the family planning services to each nook and corners of these big states.

5. References

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Appendix

Table A: Profile of the ever married women aged 15-49 years of age with at least one live birth

Variables	Bihar	Madhya Pradesh	Rajasthan	Uttar Pradesh
Number of women (Weighted)	40594	41225	35483	75677
Figures given in column %s for each of the categories unless specified				
% Women live in rural areas	91	77.2	79.7	82
Caste of the head of the household				
Scheduled caste	20.4	15.3	16.7	19.3
Scheduled tribe	2.1	24	15.8	1.4
Other backward class	58.9	42.5	47.8	56.2
None of them/others	18.6	18.1	19.7	23
Education status of the women				
Not gone to school and under 4 years of education	72.7	63.6	72.9	66.4
4 to 9 years of schooling	17.2	26.7	18.9	22.1
10 to 14 years of schooling	8.9	6.7	5.6	8.4
More than 15 years of schooling	1.2	3	2.5	3.1
Education status of Husbands				
Not gone to school and under 4 years of education	42	34.8	34.9	31.6
4 to 9 years of schooling	27	39	37.1	35.2
10 to 14 years of schooling	22.2	18	19.7	24.2
More than 15 years of schooling	7.2	7.4	8.2	8.6
Don't Know	1.6	0.9	0.2	0.5
Employment status of women				
Not employed	51.3	44.3	47.2	55.3
Cultivators	10.6	8.6	24.5	22.5
Agricultural laborer	29.5	17	9.2	12.6

Tailors, dress makers, sewers, upholsterers & related worker	0.9	0.9	1.5	2
Laborers	1.3	18.6	13.3	1.8
Farmers other than cultivators	*	4.3	*	*
All other jobs	6.3	6.4	4.3	5.8
Posses BPL Card				
Yes	26.6	40.7	18.7	27.4
No	72.9	58.7	80.9	72.2
don't know	0.5	0.6	0.4	0.4
Wealth index quintiles				
Poorest	30.2	25	19.3	20.1
Second	35.8	26.5	21	19.9
Middle	17.8	18.4	21.9	20
Fourth	10.9	15.2	19.8	19.9
Richest	5.4	15	17.9	20.1
Unmet need of spacing method				
Yes	12.7	7.3	6.8	9.9
No	87.3	92.7	93.2	90.1
Unmet need of limiting method				
Yes	24.4	11	10.7	23.4
No	75.6	89	89.3	76.6

*This category was not considered for this state

Table B: Percentage of ever married women aged 15-49 years of age with more than two children

Variables	**Bihar**	**Madhya Pradesh**	**Rajasthan**	**Uttar Pradesh**
% of women with more than 2 children	69.4	64.5	63.5	70.6
Place of Residence				
Rural	69.9	66.6	65.2	71.5
Urban	64.7	57.5	56.8	66.4

Caste of the head of the household				
Scheduled caste	71.3	70.1	68.5	73.6
Scheduled tribe	66.4	70.1	67.4	70.7
Other backward class	70.4	63.2	63.1	71.5
None of them/others	64.8	55.6	57.2	65.8
Education status of the women				
Not gone to school and under 4 years of education	74.2	74.2	71.4	78.7
4 to 9 years of schooling	62.1	53.3	48.1	61.8
10 to 14 years of schooling	49.4	36.1	33.5	45.3
More than 15 years of schooling	34.1	21.6	18.2	27.2
Education status of Husbands				
Not gone to school and under 4 years of education	75	75.7	75.8	80
4 to 9 years of schooling	68.3	63.6	62.7	71.1
10 to 14 years of schooling	64.8	55.2	53.3	65.1
More than 15 years of schooling	57.3	39.4	39.8	49.5
Don't Know	63.7	64.3	55.2	67.7
Employment status of women				
Not employed	62.2	56.7	58.2	62.8
Cultivators	77.6	65	67.2	79.9
Agricultural laborer	78.3	72.5	69.2	84.5
Tailors, dress makers, sewers, upholsterers & related worker	64.7	53.2	62.8	72.8
Laborers	76.6	73.6	72.8	82.2
Farmers other than cultivators		72.9		
All other jobs	72.1	66.3	60.8	73.9
Posses BPL Card				
Yes	73.1	69	69.5	75.2
No	68.1	61.5	62.1	68.9
Don't know	64.3	55.7	64.5	63.4

Wealth index quintiles				
Poorest	74	72.2	70.1	77.4
Second	70.9	68.5	68.6	75.1
Middle	67.1	65.5	66.1	73.4
Fourth	63.8	59.2	61.1	68.5
Richest	53.9	48.8	50.1	58.6
Unmet need of spacing method				
Yes	28.5	21.4	20.9	31.7
No	75.4	67.9	66.6	74.9
Unmet need of limiting method				
Yes	85.6	70.4	72.4	85
No	64.2	63.8	62.5	66.2