

Determinants of Reproductive Duration among Women of Jharkhand State: A Study

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KEYWORDS Age at Marriage. Age at Sterilization. Child Loss. Marriage Cohort. Fertility Preferences

ABSTRACT The reproductive span of women has been undergoing rapid change in recent decades. Reproductive span has been calculated as the time between age at marriage and age at sterilization. The state of Jharkhand, owing to its backwardness, has been chosen to study the changing trends of reproductive spans based on NFHS-III data. It has been found that older cohorts, that is, 1970-79 and 1980-89 have higher reproductive periods than later cohorts. However, religious differences in reproductive durations are minimal. Women who have more than 3 children have two times the duration of reproductive span compared to women with less than 3 children. The mean ages at sterilization, was around 28-30 years. Women with more than 3 children had higher ages at sterilization than women with below 3 children. Older cohorts such as 1970-79 and 1980-89 had higher ages at sterilization than later cohorts. Survival analysis showed the mean duration of reproduction as 10.48 years. It means that women are spending more time in reproduction than many other states in India. Hazard analysis has also been done to see the significant contribution of several social, economic and demographic variables.

INTRODUCTION

Reproductive spans of women depend upon family planning practices of women. Very few women resort to temporary methods of family planning in India. Hence, reproductive spans of women are longer. Social, cultural, demographic and health factors influence reproductive periods.

Jharkhand which came into being on 15 November 2000 as the 28th State of the Union is the homeland of the tribal population for which they had been dreaming for centuries. The Total Fertility Rate of the State is 3.2. The Infant Mortality Rate is 46 and Maternal Mortality Ratio is 312 (SRS 2004 - 2006) which are higher than the National average. A few studies on compression of reproductive duration have been undertaken.

Mohan and Nair (2009) have worked on correlates of low reproductive spans of women in Kerala based on NFHS-3 data. Padmadas et al. (2004) have worked on compression of reproductive spans in Andhra Pradesh based on NFHS-2 data. A backward state like Jharkhand may have high reproductive spans.

Reproductive spans help women in regulating their fertility. Fertility planning might lead to empowerment of women. Empowerment may be biological, social, economic, and psychological. Shorter reproductive spans,

especially biological, may empower women in many ways.

METHODOLOGY

The study is based on secondary data. NFHS-III data has been taken for analysing reproductive durations of women in Jharkhand state. Reproductive spans have been computed as the difference between age at sterilization and age at marriage. Characteristics of respondents have been presented in two-way tables. Survival analyses such as life table and Cox-proportional hazard model has been used keeping reproductive duration as a dependant variable. Several independent variables namely demographic, social, and economic and fertility preference variables have been taken for analysis.

RESULTS AND DISCUSSION

The results have been presented as characteristics of the study population and also mean ages at sterilization and mean reproductive durations.

Demographic Variables

Some relevant variables have been considered for this study. They are: age of respondent, age at first marriage, preceding birth interval, number of children ever born and ever

terminated pregnancy and number of children died. In general, more than half (56.63 per cent) of the women have not accepted sterilization.

Age of the Respondent: A good proportion (67.2 per cent) of respondents below 30 years has not adopted family planning. Around half of the women belonging to the age group beyond 30 years have adopted sterilization (48.19 per cent).

Age at First Marriage: Age at first marriage has been broadly classified as below 20 and above 20 years. Again slightly more proportion of sterilised women found in the category above 20 years than below 20 years age at marriage.

Number of Children Ever Born: This variable has been divided into below 3 children and above 3 children. More than half proportion of women has not adopted sterilization in both the categories.

Preceding Birth Interval: This variable has been made into two categories: below 24 months and above 24 months. Again more women were found in non-sterilised category than sterilised one.

Ever Terminated Pregnancy: Here too more non-sterilised women resorted to abortions than sterilised women. Probably non-sterilised women have found termination of pregnancy as a method of family planning.

Number of Children Died: Around half of the women have not experienced child mortality. Among them half (49 per cent) were sterilised (Table 1).

Social Variables

Social variables chosen were: education of the respondent, education level of partner, type of place of residence, household structure, and type of caste or tribe.

Educational Level of Respondent: In all categories of education, non-sterilised women outnumber sterilised women. A good proportion (78.31 %) of non-sterilised women has been found in the illiterate category compared to same in the sterilised category. However, around one-third of women were sterilised at secondary level of education compared to non-sterilised (12.12%) women at secondary level of education. Secondary level of education seems to be a good threshold level for sterilisation. At a higher level also, more women were found sterilised than non-sterilised women. Except at illiterate level,

Table 1: Percentage distribution of demographic characteristics of sterilised and not sterilised women

Variables	Jharkhand					
	Total		Sterilized		Non-sterilized	
	N	%	N	%	N	%
<i>Current Age of the Respondent</i>						
<30 Years	2287	100	751	32.84	1536	67.16
>30 Years	4993	100	2406	48.19	2587	51.81
Total	7280	100	3157	43.37	4123	56.63
<i>Age at Marriage</i>						
< 20 years	6785	100	2901	42.76	3884	57.24
Above 20 years	491	100	256	52.14	235	47.86
Total	7276	100	3157	43.39	4119	56.61
<i>Number of Children</i>						
Below 3 children	2558	100	1190	46.52	1368	53.48
Above 3 children	4722	100	1967	41.66	2755	58.34
Total	7280	100	3157	43.37	4123	56.63
<i>Preceding Birth Interval</i>						
< 24 months	1858	100	8234	4.29	1035	55.71
Above 24 months	1423	43.4	11855	56.59	3278	100
Total	5136	100	2246	43.73	2890	56.27
<i>Ever Had Terminated</i>						
No	5665	100	2388	42.15	3277	57.85
Yes	1615	100	769	47.6	2846	52.38
Total	7280	100	3157	43.37	4123	56.63
<i>Number of Children Died</i>						
0	4138	100	2028	49.0	2110	51.0
1	1735	100	750	43.2	985	56.8
2	913	100	309	33.8	604	62.2
3+	494	100	70	14.24	248	5.8
Total	7280	100	3157	43.4	4123	56.6

more proportion of women were sterilized than non-sterilized women. It seems education plays a good role in the adoption of sterilizations.

Partner's Education: Education of partner does also seem to be a good factor for sterilisation. At illiterate and primary levels, more husbands were found in non-sterilised category than sterilised category.

Nevertheless, a good proportion of husbands with secondary (51.43%) and higher (68.3%) level of education have undergone sterilization compared to other levels of education. It shows level of education and acceptance of sterilization as being positively related.

Type of Place of Residence: More proportion of urban residents (62.36 per cent) were sterilised than rural women whereas around one-third (34.24 per cent) rural women were sterilised. This shows existence of urban rural divide in sterilization.

Religion: Around half proportion of Hindus (50.6 per cent) have accepted sterilization whereas it was one-third (31 per cent) and one-fifth (22 per cent) among Muslims and Christians respectively.

Table 2: Percentage distribution of social characteristics of sterilised and non sterilised women belonging to Jharkhand state

Variables	Jharkhand					
	Total		Sterilized		Non-sterilized	
	No.	%	No.	%	No.	%
<i>Educational Status of Respondent</i>						
No education	5072	100	1841	36.3	3231	63.7
Primary	723	100	365	50.48	358	49.52
Secondary	1321	100	821	62.15	500	37.85
Higher	158	100	121	76.58	37	23.42
Total	7274	100	3148	43.28	4126	56.72
<i>Partner's Education Status</i>						
No education	2894	100	958	33.1	1936	66.9
Primary	933	100	367	39.34	566	60.66
Secondary	2650	100	1363	51.43	1287	48.57
Higher	587	100	401	68.31	186	31.69
Total	7064	100	3089	43.73	3975	56.27
<i>Type of Place of Residence</i>						
Urban	2362	100	1473	62.4	889	37.6
Rural	4918	100	1684	34.2	3234	65.8
Total	7280	100	3157	43.37	4123	56.63
<i>Religion</i>						
Hindu	5068	100	2564	50.62	2504	49.4
Muslim	1321	100	403	30.5	918	69.5
Christian	178	100	39	21.9	139	78.1
Total	6567	100	3006	45.8	3561	54.2
<i>Household Structure</i>						
Nuclear	3627	100	1600	44.1	2027	55.9
Non-nuclear	3418	100	1489	43.6	1929	56.4
Total	7045	100	3089	43.85	3956	56.15
<i>Type of Caste or Tribe</i>						
SC	887	100	367	41.4	520	58.5
ST	1667	100	372	22.32	1295	77.68
OBC	3440	100	1694	49.24	1746	50.76
None of them	271	100	718	56.4	953	43.51
Total	7265	100	315	43.37	4114	56.63

Household Structure: More than half (55.9 per cent) of the respondents of nuclear families have not accepted sterilisation. Among non-nuclear families also (56.4 per cent) a similar situation prevails.

Type of Caste/Tribe: Two-fifths (41.3 per cent) of scheduled caste respondents have adopted sterilization while it was still very less (22.32 per cent) among scheduled tribes. However, other backward castes (OBC) have a better picture where around half (49.2 per cent) of the respondents were sterilised. Respondents belonging to none of these categories, may be forward castes, seem to be the best in adopting sterilization (56.5 per cent) (Table 2).

Economic Indicators

Economic indicators included were: respondent's current working status, and wealth index. A good proportion of respondents were not working. Among them around two-fifths (44.9 per cent) were sterilised. It was still less among workers (40.1 per cent).

Wealth Index: Wealth index and sterilisation were found to be positively correlated. As the wealth index increases, adoption of family planning also increased. It was a mere 27 per cent among the poorest and rose to 75.5 per cent among the richest (Table 3).

Table 3: Percentage distribution of respondents according to economic characteristics of sterilised and non-sterilised women belonging to Jharkhand

Variables	Jharkhand					
	Total		Sterilized		Non-sterilized	
	No.	%	No.	%	No.	%
<i>Working Status of Women</i>						
Not working	5044	100	2263	30.5	2781	69.5
Working	2221	100	890	21.9	1331	78.1
Total	7265	100	3153	45.8	4112	54.2
<i>Wealth Index</i>						
Poor	4529	100	1424	31.44	3105	68.56
Moderate	853	100	474	55.57	3794	44.43
Rich	1898	100	1259	66.33	6393	33.67
Total	7280	100	3157	43.37	4123	56.63

Fertility Preferences

Fertility preferences were assessed by the ideal number of children, ideal number of boys, girls and ideal number of either sex of children desired by respondent.

Ideal Number of Children: It was obvious that sterilised women desire at least one child. A good proportion (66.1 per cent) of sterilised women has desired one child followed by two

(52.8 per cent) children compared to non-sterilised women. Around two-fifths (44.1 per cent) sterilised women have desired 3 children in comparison of sterilised of women of the same category. One-third proportion (27.1 per cent) of women who desired more than 4 children has accepted sterilization. Ideal number of children was applicable to sterilised and non-sterilised women. Hence, women mostly who have not conceived any child were found in the category of "0" choice of children.

Ideal Number of Boys: An almost equal proportion of sterilised (49.9 per cent) and non-sterilised women (50.1) desired "0" number of boys.

However, around half of the sterilised (51.5 per cent) and non-sterilised (49.1) women have desired at least one boy. Beyond two ideal choices of boys the scenario is different. Two-fifths (38 per cent) of sterilised women desired to have two boys compared to non-sterilised women.

Ideal Number of Girls: Among those who have no desire to have a girl child, an almost equal proportion of sterilised (48.7 per cent) and not sterilised (51.3 per cent) women have not preferred a girl child. A good proportion of those who desired one girl child (66.7 per cent) were sterilised. Similarly women who desired two girl children (57 per cent) also underwent sterilisation.

Ideal Number of Either Sex Desired: A very good proportion of women have no preference for particular of sex of child. However, among them two-fifths (42.4 per cent) were sterilised and the remaining were non-sterilised women. (Table 4)

Life Table

In this analysis reproductive spans have been calculated as the period between age at marriage and age at sterilisation. Using life table technique, the mean reproductive span for the entire population has been calculated. Probability of infecundability has been estimated at various times after first marriage and age at sterilisation. Among 2795 women, 1119 women were sterilised during 1-5 years. Their probability density was 0.071 and hazard rate was 0.10. A 1676 entered at 6-10 interval and 1009 were exposed to sterilisation. The probability density started declining while hazard rate increasing. The median survival time has been 10.4832 (Table 5).

Table 4: Percentage distribution of fertility preferences of sterilised and non-sterilised women belonging to Jharkhand

Variables	Jharkhand					
	Total		Sterilized		Non-sterilized	
	No.	%	No.	%	No.	%
<i>Ideal Number of Children</i>						
0	26	100	0	0	26	100
1	183	100	121	66.12	62	33.88
2	2774	100	1466	52.85	1278	46.07
3	2445	100	1078	44.09	1367	55.91
Above						
4 children	1852	100	492	26.57	1360	73.43
Total	7280	100	3162	43.43	4093	56.22
<i>Ideal Number of Boys</i>						
0	1086	100	542	49.91	544	50.09
1	2382	100	1227	51.51	1155	48.49
2	3489	100	1326	38.01	2163	61.99
3+	3	75	62	16.53	313	83.47
Total	7280	100.0	3157	43.37	4175	57.35
<i>Ideal Number of Girls</i>						
0	1220	100	594	48.69	626	51.31
1	4369	100	2108	48.25	2261	51.75
2	1583	100	447	28.24	1136	71.76
3+	160	100	8	5.0	152	95.0
Total	7280	100	3157	43.37	4175	57.35
<i>Ideal Number of Either Sex</i>						
0	6141	100	2606	42.44	3535	57.58
1	147	100	98	66.67	49	33.33
2	507	100	289	57	218	43
3+	485	100	164	33.81	321	66.19
Total	7280	100	3157	43.37	4123	56.63

In the case of Kerala, it was between 5-9 years duration (Mohan and Nair 2009). In the case of Bihar, Uttar Pradesh, Rajasthan, the mean reproductive spans were 11.6808, 11.8465 and 9.9732 years (NFHS-III) respectively.

Another analysis of life table with age cohort shows that duration of reproductive span condenses with recent marriage cohorts. It was 12 years for the 1970-79 cohort which comes down to 10 years for the marriage cohort 1980-89 and further comes down to 6 years for the cohort 1990-99 and 5 years for the cohort 2000-03 (Table 6).

Hazard Analysis

There were 2043 (28.1 per cent) cases, out of total cases of 7280 available after considering several demographic, social, economic and fertility preferences variables. All the independent variables considered were categorical in nature. Reproductive duration has been considered as a dependant variable.

Demographic Variables Considered Were: Age of the respondent, age at first marriage, preceeding birth interval, number of ever born

Table 5: Life table

Interval start time	Number entering interval	Number withdrawing during interval	Number exposed to risk	Number of terminal events	Proportion terminating	Proportion surviving	Cumulative proportion surviving at end of interval	Std. Error of Cumulative proportion surviving at end of interval	Probability density	Std. error of probability density	Hazard rate	Std. error of hazard rate
0	3157	0	3157	362	.11	.89	.89	.04	.023	.001	.02	.00
1	2795	0	2795	1119	.40	.60	.53	.03	.071	.004	.10	.00
5	1676	0	1676	1009	.60	.40	.21	.01	.064	.004	.17	.00
10	667	0	667	510	.76	.24	.05	.00	.032	.002	.25	.01
15	157	0	157	131	.83	.17	.01	.00	.008	.001	.29	.02
20	26	0	26	26	1.00	.00	.00	.00	.002	.000	.40	.00

a. The median survival time is 10.4832

Table 6: Life table: Median values of reproductive span and age at sterilization

Variable	Jharkhand	
	Reproductive span	Age at sterilization
<i>Marriage Cohort</i>		
1970-79	12.0101	29.3927
1980-89	10.1260	29.1459
1990-99	6.26951	26.7480
2000-03	5.0153	23.8515
<i>Type of Residence</i>		
Urban	8.9223	28.3258
Rural	11.8471	28.9729
Total	10.4832	28.6628

children, ever terminated pregnancy, and number of children died.

Social Variables Adopted Were: Education level of the respondent and spouse, type of place of residence, religion, ethnicity, and household structure.

Economic Variables Chosen Were: Working status of the respondent and wealth index.

Variables Chosen Under Fertility Preferences Were: Ideal number of children, ideal number of boys, ideal number of girls and ideal number of either sex. All the variables considered were in categorical in nature.

Hazard model has shown that place of residence, type of caste, housing structure, ideal number of girls and working status of the respondent have shown less influence in affecting duration of reproductive period.

Educational level of partner had shown no significant influence on the duration of

reproductive span at primary and higher levels whereas it was significant at secondary level. On the other hand, respondents' education was significant at primary level only. Ideal number of boys above 2 children was found to be significant.

Religion, age of the respondent, age at marriage, marriage cohort, number of children ever born, preceeding birth interval, ideal either sex, ever terminated pregnancy, number of child deaths, and wealth index have shown significant influence.

Muslims and Christians have less duration than Hindus. Women who were above 30 years had lesser reproductive spans than women below 30 years. On the other hand, women with age at marriage above 20 years had higher reproductive periods than women whose age at marriage was below 20 years. Starting with 1980-89 to 2000-03, marriage cohorts have higher reproductive spans than 1970-79 cohorts.

Women with more than 24 months of preceeding birth interval had significantly lesser intervals than women with less than 24 months. Further, those who had the experience of more child deaths had higher durations of reproductive spans than who had no experience of child deaths. Women who had attempted termination of pregnancy too had high durations of reproductive spans (Table 7).

Step wise hazard analysis has been attempted to see the most important variables having relation with reproductive duration. Out of 19 variables, 14 variables have emerged showing association after six backward step

Table 7: Cox hazard model

Variable	B	Sig. Exp.	(B)	95.0%	
				CI for Exp(B)	
				Lower	Upper
1.Type of Place of Residence (Ref: Rural)					
Urban	.093	.179	1.098	.958	1.257
2.Partners' Education (Ref: No education)					
Primary	-.094	.225	.910	.782	1.060
Secondary	-.147	.032	.864	.755	.987
Higher	-.050	.658	.951	.762	1.18
3. Age of the Respondent (Below 30 years)					
Above 30	-.566	.000	.568	.477	.675
4. Respondents' Education (Ref: No education)					
Primary	.403	.000	1.497	1.276	1.755
Secondary	.100	.179	1.105	.955	1.279
Higher	.195	.265	1.216	.862	1.715
5. Religion (Ref: Hindu)					
Muslim	-.374	.000	.688	.594	.796
Christians	-.759	.001	.468	.304	.720
6. Type of Caste (Scheduled caste)					
ST	-.036	.747	.965	.776	1.199
OBC	-.037	.629	.964	.831	1.118
Others	-.035	.714	.966	.803	1.162
7. Age at First Marriage (Ref: <20 years)					
Above 20	.487	.000	1.627	1.309	2.023
8. Marriage Cohort (Ref: 1970-79)					
1980-89	.404	.000	1.498	1.316	1.706
1990-99	.956	.000	2.601	2.156	3.140
2000-2003	2.065	.000	7.883	5.532	11.235
9. Working Status of Respondent (Not working)					
Working	.090	.105	1.094	.981	1.220
10 Number of Children Ever Born (Below 3 children)					
Above 3	-.936	.000	.392	.346	.445
11. Preceding Birth Interval (Below 24 months)					
Above 24	-.322	.000	.725	.661	.795
12. Ideal Number of Children (Below 2)					
Above 2	-.241	.024	.786	.637	.969
13. Ideal Number of Boys (0)					
1 Boy	-1.096	.006	.334	.153	.731
2 and above	.010	.928	1.010	.808	1.264
14. Ideal Number of Girls (0 girls)					
1 Girl	.045	.834	1.046	.686	1.594
2 and above	.120	.100	1.128	.977	1.302
15. Ideal Either Sex (No preference)					
1 and above	1.191	.001	.304	.147	.630
16. Number of Child Deaths (No Death)					
1 death	.454	.000	1.575	1.358	1.828
2 and above	.206	.008	1.229	1.056	1.429
17. Ever had Terminated Pregnancy (No)					
Yes	.293	.000	1.341	1.204	1.493
18. Wealth Index (Ref: Poor)					
Middle	.152	.054	1.164	.997	1.358
Rich	.138	.083	1.148	.982	1.343
19. Household Structure (Ref: Nuclear)					
Non-nuclear	.055	.245	1.057	.963	1.161

wise analysis. Age of the respondent, religion, age at marriage, marriage cohort, working status of women, number of children ever born, ever terminated pregnancy, preceeding birth interval, ideal number of children and wealth index had

significant influence on reproductive spans (Table 8).

Table 8: Step wise analysis

Variable	B	Sig. Exp.	(B)	95.0% CI for Exp(B)	
				Lower	Upper
1.Age of the Respondent (Ref: Below 30 Years)					
Above 30 years	-.585	.000	.557	.470	.661
2.Education of Respondent (Ref: No education)					
Primary	.356	.000	1.427	1.233	1.651
Secondary	.075	.234	1.078	.953	1.220
Higher	.242	.106	1.273	.950	1.706
3.Religion (Ref: Hindu)					
Muslim	-.369	.000	.691	.603	.793
Christian	-.824	.000	.438	.295	.651
4.Age at Marriage (Ref: Below 20 years)					
Above 20 years	.494	.000	1.639	1.324	2.029
5.Marriage Cohort (Ref: 1970-79)					
1980-89	.406	.000	1.501	1.321	1.705
1990-99	.930	.000	2.534	2.105	3.051
2000-03	2.015	.000	7.498	5.277	10.653
6.Working Status (Ref: No work)					
Worker	.089	.094	1.093	.985	1.213
7.Number of Children Ever Born (Ref: Below 3 children)					
Above 3 children	-.937	.000	.392	.345	.444
8. Preceding Birth Interval (Ref: below 24 months)					
Above 24 months	-.321	.000	.725	.661	.795
9.Ideal Number of Children (Ref: Below 2)					
Above 2	-.227	.025	.797	.653	.972
10. Ideal Number of Boys (Ref: 0 boys)					
One boy	-1.120	.003	.326	.157	.680
Two+boys	.072	.499	1.075	.872	1.326
11. Ideal Either Sex (Ref: No preference)					
One +	-1.186	.001	.305	.150	.621
12.Number of Child Deaths (Ref: No death)					
One death	.478	.000	1.613	1.394	1.866
Two and above	.216	.005	1.241	1.069	1.441
13. Ever had Terminated Pregnancy (Ref: No)					
	.303	.000	1.354	1.217	1.507
14. Wealth Index (Ref: Poor)					
Middle	.160	.019	1.174	1.027	1.341
Rich	.161	.005	1.175	1.051	1.313

CONCLUSION

Reproductive spans are influenced by several factors such as demographic, socio-cultural and economic factors. Naturally women with early ages at marriage may have higher durations of marriages than women married in later years. Thus, women who had ages at marriages below 20 years have longer duration of marriage than women who married above 20 years. Consequently, women

whose present age was more than 30 years were found to have longer durations of reproductive span than women below 30 years. Women who have terminated pregnancy too have higher reproductive spans than women who have not done so. It seems women resorted to abortions also besides accepting sterilization.

It seems education seems to have less importance in Jharkhand as women with higher levels of education have no significant influence on reproductive span and so also type of residence.

Reproductive duration seems to be affected by religion, women's education, number of children, ideal number of boys, marriage cohort, number of child deaths, termination of pregnancy, and wealth index. Rural and urban differences and partners' education seem to have less influence. In fact states like Bihar and Jharkhand have high densities of population and large rural areas in terms of population and size.

Measures at curtailing child mortality and better utilization of family planning methods may improve the quality of life of women. Wealth

index has emerged as an important variable. Women's empowerment may improve the status of women.

ACKNOWLEDGEMENTS

The author acknowledges the financial support given by the University Grants Commission.

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