

Child Mortality Transition among Children Born to Adolescent Mothers in India: A Study Based on National Family Health Survey (NFHS) Data

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ABSTRACT Adolescent (15-19 years) marriages are still in practice in many parts of India. As a result, many conceptions lead to mortality. Hence the data has been taken from National Family Health Survey (NFHS), which represents all India data, for the analysis. The survival chances of children have been considered for analysis. The logistic analysis has been done for the last birth order and last but one birth order using different variables in three different models. The findings indicate a distinct change from NFHS II onwards. NFHS III data has shown marked decline in mortality of infants and children. A good proportion (90 per cent) of adolescent mothers belonging to NFHS-I and II have not used any contraception compared to 87 per cent belonging to NFHS-III. Female children had better survival chances than male children in recent surveys (NFHS-III). Number of children ever born and age of the mother at marriage have seems to have inverse relation with survival status of child.

INTRODUCTION

Early child bearing has a tremendous influence on child mortality, particularly among adolescents. Several studies have concentrated on historical changes over centuries and tried to postulate theories. Bhatt (1998) has proposed two theories in Indian context: hoarding and replacement effects. He found preponderance of hoarding effect and replacement effect to follow. It has been due to high fertility in the face of existing high mortality. Bean et al. (1992) have proposed three theories: contagion and competition hypothesis, the biological insufficiency hypothesis and the maternal depletion hypothesis (among women aged 35 and above) based on historical American data. Claeson et al. (2000) reported slower declines of child mortality in India. Availability of health facilities and sani-

tation facilities has reduced mortality to greater extent than economic development. Maitra and Pal (2001) have shown that successive birth intervals affect child survival chances from a study in India and Pakistan. Further, rural residence has contributed to socio-economic inequalities in child survival (Pradhan and Arokiasamy 2010).

The above studies have concentrated mostly women of reproductive age 15-49 years. Outcome of teenage pregnancies and their determinants are seldom studied.

Theoretical Basis

The conceptual model in Figure 1 shows variables influencing child mortality among children born to adolescent married women.

Infants/children born to adolescent mothers

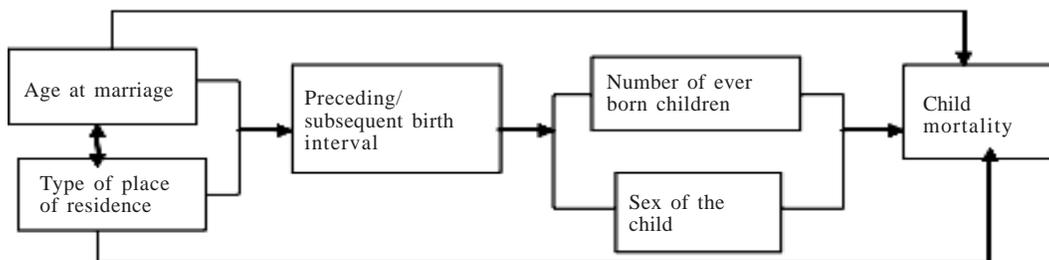


Fig. 1. Conceptual model depicting child mortality among children born to adolescent mothers

are at risk of mortality owing to several factors. It may be influenced by sex of the child, number of ever born children, preceding/succeeding birth interval, age at marriage and type of place of residence.

METHODOLOGY

The cohort of 15-19 married women has been considered as the population of the study. The National Family Health Survey data of three rounds viz., 1990, 1998 and 2005 have been considered. The data on child survival was given from last (recent birth) child to the first birth. Survival status of all birth orders of women belonging to individual ages from 15 to 19 has been tabulated to see the mortality transition within the age group 15-19.

Bivariate logistic regression has been found suitable to analyze the mortality transition of entire cohort of women belonging 15-19 years. The survival status of last child has been taken as dependant variable. Sex of the child, type of residence (Urban/Rural), and preceding and succeeding birth interval has been taken as independent variables.

RESULTS AND DISCUSSION

Initially the findings have been presented by the individual ages of the respondents. Firstly, children born to mothers of three rounds of survey have been presented by birth order. Later on regression analysis has been presented with the survival status of last and last but one birth order.

It is interesting to note that National Family Health Survey -III (NFHS-III) has covered 124,385 households whereas the preceding surveys have covered less than 100,000 households (NFHS-I: 89,777 and NFHS-II: 90,303). Among them 8.7, and 7.8 per cent households belonged to 15-19 years married women. However, NFHS-III has considered 23955 youth population in the age group 15-19 (both married and unmarried). Among them 4911 (5.24 per cent) were married.

In the following section 15-19 years married women and their fertility performance according to individual ages has been given.

Proportion of Children Alive for the Mothers Aged 15

In all the three surveys, mothers aged 15 years had 2 children only. NFHS-I and II surveys has

showed that they had equal proportion of children at birth orders 1 and 2 (Table 1).

Table 1: Proportion of children born to mothers aged 15

Age 15 birth order	NFHS-I	NFHS-II	NFHS-III
0	428 (79.9)	403(77.5)	194 (81.17)
1	102 (19.0)	109(21.0)	41(17.15)
2	6 (1.1)	8 (1.5)	4 (1.7)
Total	536 (100)	520 (100)	239 (100)

Proportion of Children Alive for the Mothers Aged 16

A similar proportion of mothers belonging to NFHS-I, II and III had one and two birth order children. Three mothers belonging to NFHS-II had third child. However, the sample of married women at NFHS-III was around half of the previous surveys (Table 2).

Table 2: Proportion of children born to mothers aged 16

Age 16 birth order	NFHS-I	NFHS-II	NFHS-III
0	667(69.0)	651(68.7)	344(68.0)
1	270(27.9)	252(26.6)	135(27.4)
2	30 (3.1)	42 (4.4)	14 (2.8)
3		3 (0.3)	
Total	967 (100)	948	493 (100)

Proportion of Children Alive for the Mothers Aged 17

Numbers of women who have no children were slightly less at NFHS-III at 17. At each birth order NFHS-III women had lesser children than women of NFHS-I and II. Again sample of women of NFHS-III were half compared to the other surveys (Table 3).

Table 3: Proportion of children born to mothers aged 17

Age 17 birth order	NFHS-I	NFHS-II	NFHS-III
0	800 (57.9)	742 (58.3)	483 (63.1)
1	476 (34.4)	440 (34.6)	241(31.46)
2	97 (7.0)	79 (6.2)	38 (5.0)
3	9 (0.7)	11 (0.9)	4 (0.52)
Total	1382(100.0)	1272(100.0)	766(100.0)

Proportion of Children Alive for the Mothers Aged 18

Fewer women belonging to NFHS-III have conceived children than the other two surveys. Interestingly at each birth order also slightly lesser women belonging to NFHS-III have given birth to children than NFHS-I and II (Table 4).

Table 4: Proportion of children born to mothers aged 18

Age 18 birth order	NFHS-I	NFHS-II	NFHS-III
0	1308(51.9)	1143(51.9)	925(56.85)
1	905(35.91)	820(37.2)	550(33.8)
2	281(11.15)	216 (9.8)	131 (8.05)
3	24 (0.95)	22 (1.0)	20 (0.12)
4	1 (0.04)	3 (0.1)	1 (0.06)
5	1 (0.04)	-	-
Total	2520(100.0)	2204(100.0)	1627(100.0)

Proportion of Children Alive for the Mothers Aged 19

Here differences were marked from 2nd birth order onwards. Women belonging to NFHS-III had lesser number of children than NFHS-I and II (Table 5).

Table 5: Proportion of children born to mothers aged 19

Age 19 birth order	NFHS-I	NFHS-II	NFHS-III
0	933(38.7)	826(39.4)	804(45.0)
1	1016(42.2)	825(39.3)	707(39.59)
2	373(15.5)	366(17.5)	226(12.65)
3	76 (3.2)	72 (3.4)	44 (2.46)
4	11 (0.5)	8 (0.4)	5 (0.28)
5	1 (0)	-	-
Total	2410(100.0)	2097(100.0)	1786(100.0)

Demographic Indicators

These indicators have been presented taking all the women belonging to the age group 15-19. Mean ages at marriage were 15.54 (7815), 16.25 (7041), and 15.73 (4911) years respectively for NFHS-I, II, and III. Around half of NFHS-I women (47.1 per cent) had children compared to NFHS-II (46.7 per cent) and NFHS-III (44 per cent). Mean ages at first birth were 16.29 (3679), 15.64 (3276),

and 16.59 (2161) years respectively. Very few women had sterilization at the three surveys. Mean ages at sterilization has been 17.58 (78 women), 16.9 (79 women), and 17.8 (45 women) years respectively for the three surveys.

Contraceptive Use

More than 90 per cent of adolescent mothers belonging to NFHS-I and II have not used any contraception compared to 87 per cent belonging to NFHS-III. Pill use was better (2.5 per cent) among women of NFHS-III than NFHS-I (0.7 per cent) and II (1.5 per cent). Condom use was also better among women of NFHS-III (3.8 per cent) than women belonging to NFHS-I (1.5 per cent) and II (1.4 per cent). Periodic abstinence was practiced by 3.2 per cent women in NFHS-III whereas it was 2 per cent in NFHS-I and 1.7 per cent in NFHS-II. The other methods of temporary contraception were: withdrawal: NFHS-III: 2.4 per cent; 1.3 per cent each during NFHS-I and II. One case each used foam or jelly, other modern method and folklore method during NFHS-III.

Around 74 women and 4 men had family planning sterilization at NFHS-I. It was 78 women and one man during NFHS-II whereas it was only 45 female sterilizations only during NFHS-III.

Logistic Regression

Due to small size at each age group of adolescents entire group of adolescent have been considered for the analysis. Logistic regression has been performed for the age group 15-19 separately for the three rounds of survey. The dependant variable survival status of the infant has been coded as not alive as code 0 and alive as code 1. The analysis has been done for the last and last but one birth order. Three models have been proposed for the last and last but one birth order. Sex of the child (Male: ref) and preceding birth interval has been included in the first model for the last birth order whereas succeeding birth interval instead of preceding birth interval has been considered for the last but one birth order. Preceding and succeeding birth intervals have been used for last birth order and last but birth order respectively for obvious reasons. The other variables have not been

Table 6: Logistic regression for the last birth column for the age group of women 15-19 years

	NFHS-I		NFHS-II		NFHS-III	
	Sig.	Exp	Sig.	Exp	Sig.	Exp
Step 1(a) Sex of the child Male (ref)	.960	.986	.490	1.213	.028	2.376
Preceding birth interval	.434	1.012	.201	1.019	.051	1.045
Constant	.000	11.059	.000	7.722	.023	3.435

considered for the reasons of early ages at marriage happen only in certain societies only. The second model consists of sex of the child, type of residence (Urban/Rural), and number of children ever born. The last and third model consists of sex of the child, number of children ever born, age at marriage and type of place of residence.

Last Birth Order of Child

First Model

It included variables like sex of the child and preceding birth interval.

NFHS-I

There were 896 cases were available for analysis. Among them 459 were males. The sex ratio has been 95 females for 100 males. Out of total cases, 57 children were dead. The proportion works out to be 6 percent.

NFHS-II

There were 816 cases. The sex ratio has been 89.7 females for 100 males. The proportion of dead (56) has been 6 per cent.

NFHS-III

Four hundred and seventy-five cases were available for analysis. The sex ratio has been 103.8 females for 100 males. The proportion of dead (32) has been 6.7 per cent.

In all the surveys the proportion of dead has been around 6 percent. However 6.7 percent per cent was high at NFHS-III.

Logistic regression analysis showed that female children have better survival chances than male children at NFHS-III survey only. Higher preceding birth interval was responsible for better survival at NFHS-III survey only (Table 6).

Second Model

In this model sex of the child, type of place of residence and number of children ever born were considered.

NFHS-I

The number cases available for analysis were gone up to 3679. Urban people constitute 652, whereas males constitute 1871. Out of the total available cases 295 children died.

NFHS-II

The number cases available for analysis were gone up to 3276. Urban people constitute 551, whereas males constitute 1743. Out of the total available cases 222 children died.

NFHS-III

The number cases available for analysis were gone up to 2161. Urban people constitute 564, whereas males constitute 1087. Out of the total available cases 119 children died.

The results of logistic regression were mixed in nature. Female children have better survival chances than male children in all the surveys, however, the results of NFHS-II were not significant. Rural children had lesser chances of survival than urban children except NFHS-III (Table 7). Pradhan and Arokiasamy (2010) have also found that rural children had lesser survival chances than urban children.

Third Model

In the third model age at marriage has been included as a fourth variable. All the four variables were significant at NFHS-I, one at NFHS-II (type of place of residence) and III (sex of the child). Survival of the female child was 30 per

Table 7: Logistic regression for the last birth column for the age group of women 15-19 years

	NFHS-I		NFHS-II		NFHS-III	
	Sig.	Exp	Sig.	Exp	Sig.	Exp
Sex of the child Male (ref)	.051	1.269	.470	1.106	.023	1.550
Type of place of residence (Urban: ref)	.006	.601	.037	.639	.602	.891
No. of children ever born	.313	1.127	.663	.947	.022	.702
Constant	.000	13.604	.000	20.684	.000	24.438

Table 8: Logistic regression for the last birth column for the age group of women 15-19 years

	<i>NFHS-I</i>		<i>NFHS-II</i>		<i>NFHS-III</i>	
	<i>Sig.</i>	<i>Exp</i>	<i>Sig.</i>	<i>Exp</i>	<i>Sig.</i>	<i>Exp</i>
Sex of the child Male (ref)	.045	1.279	.469	1.107	.025	1.543
Type of place of residence (Urban: ref)	.020	.647	.053	.658	.670	.909
No. of children ever born	.029	1.317	.939	.990	.111	.761
Age at marriage	.000	1.153	.338	1.047	.290	1.064
Constant	.723	1.269	.007	9.627	.032	8.700

cent and 54 per cent at NFHS-I and III. Children of rural residence have lesser survival chances than urban children at NFHS-I and II. The variable Number of children ever born was also significant at NFHS-I (Table 8).

Last But One Birth Order

First Model

In this analysis succeeding birth interval has been taken as an independent variable instead of preceding birth interval for obvious reasons.

NFHS-I

At NFHS-I, 803 cases were available for the analysis. 397 were males and the sex ratio has been 102 females for 100 males. 150 children are not alive. The proportion of children not alive works out to be 18.7 per cent.

NFHS-II

At NFHS II, 894 cases were available analysis. 449 males were males and the sex ratio has been 99 females for 100 males. 189 children are not alive. The proportion of children not alive was 21 per cent.

NFHS-III

At NFHS-III, 468 cases were available for analysis and among them 236 were males. The sex ratio has been 98 females for 100 males. Among the total cases 88 children died. The proportion of children not alive works out to be 18 per cent.

The logistic regression analysis shows that longer succeeding birth interval has increased child survival in all the three surveys. (Table 9).

In fact inter birth interval relates to replace-

ment effect (Maitra and Pal 2001 and Bhat 1998). Higher the duration between one births to another birth higher the survival chances of children.

Second Model

NFHS-I

The number cases available for analysis were 910. Urban people constitute 144, whereas males constitute 460. Out of the total available cases 198 children died.

NFHS-II

The number cases available for analysis were 830. Urban people constitute 125, whereas males constitute 408. Out of the total available cases 96 children died.

NFHS-III

The number cases available for analysis were 487. Urban people constitute 117, whereas males constitute 244. Out of the total available cases 96 children died.

Number of children ever born was found to be significant inverse relationship with survival chances at NFHS-I only (Table 10).

Third Model

In this model, age at marriage of the mother has been added to see its influence on child survival. Number of children ever born and age at marriage of the mother have emerged as significant variables. Number of children ever born and age of the mother at marriage have inverse relation with child survival. Number of children ever born was significant at NFHS-I and

Table 9: Logistic regression for the last but one birth order for the age group 15-19 years

	<i>NFHS-I</i>		<i>NFHS-II</i>		<i>NFHS-III</i>	
	<i>Sig.</i>	<i>Exp</i>	<i>Sig.</i>	<i>Exp</i>	<i>Sig.</i>	<i>Exp</i>
Step 1(a) Sex of the child Male (ref)	.939	.987	.807	1.048	.773	1.072
Succeeding birth interval	.000	1.077	.000	1.127	.000	1.063
Constant	.080	.620	.000	.275	.941	.972

Table 10: Logistic regression for the last but one birth order for the age group 15-19 years

	NFHS-I		NFHS-II		NFHS-III	
	Sig.	Exp	Sig.	Exp	Sig.	Exp
Sex of the childMale (ref)	.875	1.026	.618	1.091	.985	.996
Type of place of residence (Urban: ref)	.171	.723	.140	.669	.576	.858
No. of children ever born	.062	.716	.011	.607	.811	1.072
Constant	.000	9.665	.000	16.373	.000	3.952

Table 11: Logistic regression for the last but one birth order for the age group 15-19 years

	NFHS-I		NFHS-II		NFHS-III	
	Sig.	Exp	Sig.	Exp	Sig.	Exp
Sex of the childMale (ref)	.887	1.023	.667	1.079	.954	.987
Type of place of residence (Urban: ref)	.127	.695	.103	.639	.505	.832
No. of children ever born	.025	.660	.007	.583	.723	.898
Age at marriage	.083	.904	.192	.916	.022	.826
Constant	.000	48.786	.000	64.906	.003	83.515

II surveys only whereas age of the mother was significant at NFHS-I and II only (Table 11).

CONCLUSION

Rural and urban difference in mortality indicate rural disadvantage. Rural women may be conceiving more children to augment future loss of children which may indicate insurance effect. Age at marriage is positively related to the survival of the child. Female children have higher survival chances than male children. It shows that teenagers have not formed any idea of sex choice of children. Alternatively their choices of sex selection are in the formative stage. Higher preceding birth interval had higher levels of child survival of last birth order while succeeding birth interval has a positive influence on the survival status of children. These results suggest adolescent mothers may be influenced by conceiving children as a prerequisite of married woman. Further studies on an in depth scale are required for understanding the fertility preferences of adolescent mothers.

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