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FACTORS AFFECTING ADOLESCENT CHILDBEARING AND ITS IMPLICATIONS ON MATERNAL AND CHILD HEALTH IN INDIA

Sukanta Sarkar

Assistant Professor, The ICFAI University Tripura

Introduction

Adolescent pregnancy is widely recognised as a complex and serious problem in India. Early childbearing appears to have negative effects beyond socio-economic and cultural factors (UNICEF, 2008). In some cases, the mother's age directly affects birth outcomes; in other cases, the mother's age influences other relevant factors that in turn affect her social, economic and physical well-being and that of her child. Studies conducted on adolescent pregnancy show that teenage pregnant women, especially those under the age of 19 years, suffer more complications like maternal morbidity and mortality and often give birth to premature and low birth weight babies (Bhagat, 2002). Miscarriages, stillbirths and neo-natal deaths are more frequent among adolescent mothers. Biological vulnerability for adverse outcomes among younger mothers may also persist due to physical immaturity and exacerbation of the effect of chronic malnutrition and scarce nutrients from the mother to foetus (Raj *et.al* 2010). Factors such as early age at marriage, illiteracy, poor economic conditions and cultural issues are the main reasons for adolescent childbearing. This can be reduced with early and regular prenatal care (Alam, 2000). Generally,

adolescents neglect their physical health regardless of pregnancy. Secondly, poor eating habits and poor healthcare are relatively common among this age group (Raja *et. al* 2009). Lack of education and inadequate access to healthcare may also prevent adolescents from resorting to good antenatal care and skilled delivery care (Sivaram, *et.al*, 1995).

Studies conducted on adolescent childbearing show that adolescent pregnant women are at increased risk for domestic violence. A study conducted on teenage pregnant women revealed that 26 per cent of mothers aged 17 years or younger and 23 per cent of mothers aged 18 and 19 years experienced violence (Covington *et al.*, 2001). Among teens who reported physical violence, over 50 per cent reported being injured in the abdominal area. While the majority of teens reported being battered by their husbands, about 25 per cent reported attacks by a relative, including mother (9.6 per cent), father (6.5 per cent) and brother (6.5 per cent) (Gessner and Perham, 1998). Adolescents who reported severe pre-natal violence were significantly more likely to deliver pre-term than those reporting other violence or no pre-natal violence (Covington *et al.*, 2001).

There is evidence to show the vulnerability of adolescent childbearing. However, studies that analysed the factors responsible for adolescent childbearing and its implications for maternal and child healthcare are less. This is important because proper care during pregnancy and safe delivery can reduce maternal and child morbidity and mortality. Concerted efforts are, therefore, needed to provide useful information to planners and policy-makers to design appropriate strategies to bring about an improvement in maternal and child welfare. Therefore, an attempt has been made in the present analysis to highlight factors affecting adolescent pregnancy and its effect on maternal and child health in India.

Objectives of the Study:

The focus of the study is:

- to examine the extent of adolescent childbearing;
- to study the factors affecting adolescent childbearing;
- to highlight the implications of adolescent childbearing on maternal and child health.

Data for the study

Data for the present study has been taken from the National Family Health Surveys (NFHS-1, NFHS-2 and NFHS-3) conducted during 1992-93, 1998-99 and 2005-06. The NFHS surveys were carried out in all the major states of India. For NFHS-1, as many as 89,777 ever-married women aged 13-49 years in 24 states were interviewed. For NFHS-2 and NFHS-3, about 91,000 ever-married women aged 15-49 years across 26 states, and 124,385 women aged 15-49 from 29 states were interviewed, respectively (IIPS and Macro International 2007). In these surveys, the extent of adolescent pregnancies and problems of maternal and child health

were measured more directly on a larger scale.

Methodology of the study

In all the NFHS surveys, women were asked about their current age, age at marriage, age at first childbirth and number of children both living and dead. NFHS-2 collected information from women about their two most recent births in the three years preceding the survey and for NFHS-3 the most recent births in the five years preceding the survey. For the present study, the problems relating to the most recent births have been taken. In all the surveys, the mother was asked if at any time of pregnancy she had experienced any of the following pregnancy-related problems: blurred vision, convulsions other than from fever, swelling of hands and feet, excessive fatigue, anaemia, and vaginal bleeding. Women who had childbirths were asked if they had massive vaginal bleeding or very high fever at any time during the two months after delivery. Thirdly, in order to understand morbidity conditions during pregnancy, the survey asked whether respondents have taken any antenatal care during pregnancy, frequency of such care, place of delivery and problems during delivery. From this data, the extent of teenage pregnancies and problems during pregnancy and delivery have been analysed. In addition, socio-economic and demographic characteristics have been analysed to assess whether socio-economic variables had any effect on adolescent childbearing and its impact on maternal and child healthcare.

Findings of the study

Section-I

Characteristics of Adolescent Women

The National Family Health Surveys have collected information from women aged between 15 and 49 years. Of those surveyed, adolescent women aged 15-19 years accounted for 10.13 per cent in NFHS-1, 9.09 per cent in NFHS-2 and

5.50 per cent in NFHS-3. This indicates that marriage of girls at young ages is declining. The number of girls given in marriage before the age of 20 years is going down because pregnancy and motherhood at a very young age causes a number of health problems besides social, economic and emotional problems. In addition to higher levels of pregnancy, complications among young mothers, physiological immaturity and inexperience associated with childcare practices affect maternal and infant health. The information collected from women for the NFHS surveys varies between 1992-93 and 2005-06. In NFHS-1 all ever-married women were included but during NFHS-3, unmarried women were also covered to understand reproductive health, nuptiality and gender relation; for the present study, only married women have been considered. For the present analysis, the number of ever-married women in the age group of 15-19 years in 1992-93 was 9,094. In 1998-99, it was 8,276 and in 2005-06 it was 6,842. Data provided in Table-1 shows the demographic characteristics of adolescent women in the age group of 15-19 years. Over the period, the number of women in early marriage has reduced while the number of women marrying at 18 years and above has increased. For instance, the proportion of

women at the age of 15 years was around 8 per cent during NFHS-1 and it reduced to around 6 per cent in NFHS-3. However, for the age group of 19 years, it increased from 29 per cent in NFHS-1 to 33 per cent at NFHS-3. During the 1990s, the age at marriage was much below the legal age for marriage and more than two-thirds of women had got married before the age of menarche. Although the proportion reduced further in 2005-06, around 30 per cent of women had married before reaching the age of 15 years. During NFHS-1, only 11 per cent of the women married before reaching the legal age and it increased slightly to around 16 per cent in 2005-06. The number of women who married before the legal age for marriage remained the largest group in India. Among the adolescent married women, around 47 per cent had at least one child at the time of survey in 1992-93 but in 2005-06, around 44 per cent of them had a child at the time of survey. Although adolescent pregnancy has reduced, more than two-thirds of women are bearing the burden of adolescent fertility and it is a major concern for a developing country like India. Interestingly, Table-1 shows that in 1992-93 around 12 per cent of women had 2 or more children, and it increased to 13 per cent in 1998-99, but reduced to around 10 per cent in 2005-06.

Table-1: Percentage of married women age 15-19 years by demographic characteristics

Demographic characteristics	NFHS-1 N=9094	NFHS-2 N=8276	NFHS-3 N= 6842
Age in single year			
15	7.4	7.9	5.8
16	12.6	14.1	11.0
17	18.6	18.6	16.6
18	32.4	30.3	33.3
19	29.0	29.1	33.3
Age at Marriage			
<15	43.0	29.5	29.6
15	19.1	21.0	19.2
16	15.7	20.1	19.2
17	11.0	15.1	16.5

Demographic characteristics	NFHS-1 N=9094	NFHS-2 N=8276	NFHS-3 N= 6842
18	8.9	11.5	12.5
19	2.2	2.7	3.1
Current Marital Status			
Currently Married	97.8	97.9	98.3
Widow/Divorced/Separated	2.2	2.1	1.7
Ever had given Birth			
Yes	47.4	47.5	43.7
No	52.6	52.5	56.3
Children Born			
0	52.6	52.5	56.3
1	35.2	34.7	33.3
2	10.4	11.0	9.0
3 & Above	1.8	1.9	1.4
Total	100.0	100.0	100.0

Data provided in Table-2 shows the socio-economic characteristics of married women aged 15-19 years in India. Geographically, around 15.6 per cent of the adolescent women were found in urban areas from 1992-93 to 2005-06. The percentage of adolescent women from non-poor caste groups like Other Backward Classes and Others has decreased whereas that of Scheduled Castes and Scheduled Tribes has increased. Similarly, around 15 per cent of women belonged to Scheduled Castes and Scheduled Tribes in 1992-93 and it has increased to 23 per cent in 2005-06; the percentage of Other Backward Classes and Others that was around 75 per cent in 1992-93 decreased to around 65 per cent in 2005-06. Considering religion, over the period, the proportion of Hindu women decreased while that of Muslim women increased by around 2 per cent. Secondly, it can be observed from Table-2 that in 1992-93 around two-thirds of women in

the age group of 15-19 years were illiterate. This percentage has come down to around 53 per cent in 1998-99 and 42 per cent in 2005-06. The proportion of women with secondary level education and above increased from 14 per cent in 1992-93 to 25 per cent in 1998-99 and to around 36 per cent in 2005-06. The economic status of women during NFHS-2 shows that around 40 per cent of women had low standard of living and it reduced to around 28 per cent at the time of NFHS-3. During NFHS-1, data had not been collected on standard of living, and so we could not compare the standard of living of adolescent women in 1992-93. The working status of the women increased during NFHS-2, but decreased at the time of NFHS-3. During NFHS-1, around 25 per cent of adolescent women were working, and this has increased to around 29 per cent during NFHS-2 but reduced to around 23 per cent during NFHS-3.

Table-2: Percentage of married women aged 15-19 years by socio-economic characteristics

Socio-economic characteristics	NFHS-1 N=9094	NFHS-2 N=8276	NFHS-3 N= 6842
Place of Residence			
Urban	15.1	14.7	16.1
Rural	84.9	85.3	83.9
Social Group			
Scheduled Caste	14.8	21.2	23.8
Scheduled Tribe	9.8	10.4	10.4
OBC	NA	34.9	42.5
Other	75.5	32.1	22.8
Religion			
Hindu	83.3	82.4	82.0
Muslim	13.2	14.6	15.2
Christian	1.1	1.4	1.1
Sikh	0.8	0.7	0.5
Other	1.5	0.9	1.2
Education			
Illiterate	67.1	53.4	41.9
Primary	18.6	18.8	21.2
Secondary	14.3	25.6	36.3
Higher	0.0	2.2	0.6
Household Standard of Living			
Low	NA	39.8	28.1
Medium	NA	50.1	32.8
High	NA	10.1	20.0
Dejure Resident	NA	NA	19.0
Working Status			
Yes	24.5	28.7	22.7
No	75.4	71.2	77.2
Total	100.0	100.0	100.0

Extent of adolescent women who had a child

It is interesting to look at the data of adolescent women who had a child by region and inter-state variations. The data show that about 47 per cent of adolescent women had a child in 1992-93, which was almost the same during 1998-99 but reduced to about 44 per cent in 2005-06. Over a period, the percentage of adolescent women who had children

reduced but it is still very high in the country. When we look at the data on regional variations among adolescents, it is the Northern region where the proportion of adolescent mothers was less during different NFH Surveys. It varies from about 40 per cent in 1992-93 to 38 per cent in 2005-06. The Western region had the maximum number of adolescent mothers in the age group of 15-19 years. These data are shown in Table-3.

Table-3: Percentage of married women who got child among adolescents by regions

Region	NFHS-1		NFHS-2		NFHS-3	
	Percent	N	Percent	N	Percent	N
North	40.5	884	38.9	653	38.1	675
Central	42.6	2502	47.1	2600	42.1	1756
East	45.3	2304	45.6	1940	45.2	2398
Northeast	61.3	318	50.6	257	49.3	225
West	57.5	1086	52.4	1084	47.9	722
South	51.2	2000	49.8	1742	42.1	1066
Total	47.4	9094	47.5	8276	43.7	6841

An interesting picture emerges when we look at the data on inter-state variations for women aged 15-19 years which has been provided in Table-4. NFHS-1 found that the proportion of adolescent mothers was maximum in Assam (62 per cent), followed by Maharashtra and Karnataka (60 per cent). On the other hand, the same survey (NFHS-1) found fewer adolescent mothers in Rajasthan and Jammu (36 per cent) followed by Kerala (38 per cent). However, during NFHS-2 (1998-99), the

maximum proportion (54 per cent) of adolescent mothers was found in Karnataka and Maharashtra, and least in Kerala (26 per cent) and Delhi (29 per cent). During NFHS-3, the maximum proportion of adolescent mothers was found in Jammu (50 per cent), West Bengal (49 per cent) and Maharashtra (49 per cent). The lowest number of adolescent mothers was found in Kerala (27 per cent), Punjab (31 per cent) and Haryana (33 per cent).

Table-4: Percentage of married mothers in the age group of 15-19 years by States

States	NFHS-1		NFHS-2		NFHS-3	
	Percent	N	Percent	N	Percent	N
Andhra Pradesh	49.5	975	49.8	851	40.9	509
Assam	62.5	261	49.8	205	48.2	168
Bihar	40.6	1172	43.5	1057	42.4	1073
Gujarat	47.1	261	47.8	276	45.4	218
Haryana	49.8	203	42.1	107	33.0	106
Himachal Pradesh	39.3	28	36.4	11	37.5	8
Jammu	36.4	22	50.0	26	50.0	16
Karnataka	58.9	518	54.5	475	48.0	371
Kerala	37.8	119	25.8	97	26.8	56
Madhya Pradesh	43.4	901	48.4	900	37.6	399
Maharashtra	60.7	825	54.0	806	49.2	502
Orissa	49.5	291	49.3	217	44.0	216
Punjab	42.6	94	42.4	59	31.7	63
Rajasthan	35.8	489	37.9	422	39.8	437
Tamil Nadu	49.2	388	50.0	320	37.7	130
West Bengal	50.4	841	47.7	665	49.2	778
Uttar Pradesh	42.2	1601	46.4	1700	43.4	1201
New Delhi	45.7	46	28.6	28	45.5	22
Total	47.4	9094	47.5	8276	43.7	6841

Data provided in Table-5 reveals the percentage of adolescent women currently having children, currently pregnant and pregnant for the first child. Around 48 per cent of adolescent women had children at the time of NFHS-1 and it reduced to 43.7 per cent at the time of NFHS-3 but the reduction was very less. Adolescent

women currently pregnant were about 19 per cent in NFHS-1 and it increased to around 20 per cent in 2005-06. Women who were pregnant for the first child in NFHS-1 were about 23 per cent and this percentage increased to 25 per cent during NFHS-3

Table-5: Percentage of adolescent women currently having children, currently pregnant and pregnant for first child

	NFHS-1		NFHS-2		NFHS-3	
	Percent	N	Percent	N	Percent	N
Adolescent women currently having children	47.4	9094	47.5	8276	43.7	6842
Adolescent women currently pregnant	18.8	8886	18.8	8276	19.9	6842
Adolescent women pregnant for first child	23.0	4642	23.6	4347	25	3854

Section II

Adolescent Maternal Health Care

Promotion of maternal and child health care has been one of the important objectives of the family health programme and important elements of this programme include provision of antenatal care, encouragement of institutional deliveries, management of reproductive tract infections, sexually transmitted diseases etc. Antenatal care (ANC) refers to pregnancy-related healthcare, which is usually provided by a doctor, an ANM or any healthcare professional. Ideally, ANC should monitor a pregnancy for signs of complications, detect and treat pre-existing and concurrent problems of pregnancy, and provide advice and counselling on preventive care, diet during pregnancy, delivery care, postnatal care and related issues. The Reproductive and Child Health Programme recommends that as part of antenatal care women should receive at least three antenatal check-ups which should include periodic monitoring of

weight and blood pressure, abdominal examination, immunisation against tetanus, and management of iron and folic acid prophylaxis to control anaemia (Ministry of Health and Family Welfare, 2005: IIPS and Macro International, 2007). The National Family Health Survey has collected data from women regarding problems during pregnancy and their antenatal healthcare, their problems during pregnancy and treatment taken and the place of delivery. For the present study, we concentrate on ever married adolescent women aged 15-19 years who were pregnant and had given birth before the NFHS surveys.

As mentioned earlier, about 47 per cent of adolescent women during NFHS-1 and NFHS-2, and 43.7 per cent during NFHS-3 had given birth during the surveys. Of this, about 18 per cent were currently pregnant and 23 per cent of adolescent women were

pregnant for the first child. But more than half of the women in NFHS-1 and about two-thirds of adolescent women in NFHS-2 and nearly 78 per cent of women in NFHS-3 had taken ANC when they were pregnant. To avoid complications during pregnancy, the timing and frequency of ANCs are very important. The surveys show that over the period, the ANC visits within the first trimester increased from 34 per cent during NFHS-1 to around 50 per cent during NFHS-3. However, the percentage of women who had taken ANC in the third trimester decreased from 21 per cent in NFHS-1 to 10 per cent in NFHS-3. Secondly, the main objective of the Safe Motherhood as well as Reproductive and Child Health

programmes is to encourage deliveries in hygienic conditions and supervised by trained health professionals. This is because institutional delivery reduces the risk of maternal death as well as risk of death of newborn. However, institutional delivery depends upon availability and accessibility of delivery services in areas where the mother resides. Data provided in Table-6 shows around 23 per cent of women were delivering in institutions while 77 per cent of women gave birth at home. More importantly, fewer women were using PNC services in the country. During NFHS-2, only 29 per cent of women had utilized PNC services, which increased to 35 per cent in NFHS-3.

Table-6: Percentage of adolescent women who had ANC, place of delivery and post-natal care for the last childbirth

		NFHS-1	NFHS-2	NFHS-3
Women who had ANC		54.2	61.6	77.9
Place of delivery	Home	76.8	69.4	62.4
	Institution	23.2	30.6	37.6
Women who had post-natal care		-	28.8	35.0

Pregnancy complications among adolescent women

This section explains the complications during pregnancy and post-delivery complications among adolescent women and the linkages with other obstetric care in India. Data in Table-7 depicts the complications during pregnancy for NFHS-2 and NFHS-3. During NFHS-2, more types of complications during pregnancy were collected. Overall, during NFHS-2, around 37 per cent of women aged 15-19 years reported that they did not have any complications during pregnancy. However, the maximum number of complications reported was about night

blindness (about 22 per cent), followed by blurred (around 19 per cent) vision and convulsions (11 per cent). Around 2 per cent of women had reported anemia and less than one per cent reported vaginal bleeding during NFHS-2. In NFHS-3, less serious complications were reported besides convulsions, swelling, fatigue and vaginal bleedings. As shown in the Table, about 12 per cent of adolescent women had reported that they did not have any complications during their pregnancy but around 50 per cent reported excessive fatigue, followed by swelling (23 per cent). Around 3 per cent reported vaginal bleeding.

Table-7: Percentage of adolescents who had pregnancy complication during last child birth

Type of complications	NFHS-2		NFHS-3	
	Percent	N	Percent	N
No Complications	37.2	1387	12.1	362
Night Blindness	21.6	803	NA	NA
Blurred vision	18.9	703	NA	NA
Convulsions	11.4	425	11.7	349
Swelling	6.4	240	23.4	698
Excessive Fatigue	2.9	109	49.9	1493
Anaemia	1.4	51	NA	NA
Vaginal Bleeding	0.2	10	2.7	82
Total	100.0	3728	100.0	2984

In the NFHS surveys, a woman who gave birth in the year preceding the survey was asked if she had massive vaginal bleeding or very high fever — both symptoms of possible postpartum complications — at any time during the two months after delivery. Women reported massive vaginal bleeding for 14 per cent of births and very high fever for 15 per cent of births. Both complications were more common among rural mothers rather than urban mothers. The likelihood of massive vaginal bleeding did not vary much by mother's age or birth order. Very high fever was more likely to

be reported for first few births. The likelihood of having massive vaginal bleeding did not vary much by place of delivery, but very high fever was much more common for home delivery than for institutional births. Data also show that around 7 per cent of women faced both types of problems, namely vaginal bleeding and high fever whereas around 15-17 per cent of women experienced only one problem. Overall, 21 to 23 per cent of women faced some kind of problem after delivery.

Table-8: Percentage of adolescent women who experienced post-delivery complications

Type of complications	NFHS-2		NFHS-3	
	Percent	N	Percent	N
Vaginal Bleeding	14.0	3728	14.1	2984
High Fever	14.1	3728	15.6	2984
Any one of them	15.2	3728	17.0	2984
Both	6.5	3728	6.4	2984
Not at all	78.3	3728	76.6	2984

Section-III

Determinants of adolescent childbearing and its linkages

To understand the demographic, socio-cultural, economic and regional variation of adolescent childbearing, pregnancy with first child and maternal healthcare multivariate analysis has been worked out. On demographic characteristics, age of women and age at marriage, socio-cultural and economic characteristics of social groups, education, religion and standard of living are considered. On spatial characteristics, place of residence and region are selected. However, the age of women considered as adolescent is 15-19 years, and hence to delineate the effect of different factors some modifications have been done. Similarly, women's age and age at first marriage have been clubbed into less than 18 years and 18 years and above. Education has been categorized into illiterate, primary and secondary and above. Standard of living index is not available for NFHS-1 and at the time of NFHS-3, *not de jure resident* has also been considered as a separate category, but for better comparison of NFHS-2 and NFHS-3, *not de jure resident* category has not been considered here. Further, within religion, only Hindus and Muslims have been considered. The binary logistic regression is modeled to observe the determining factors of adolescent childbearing and adolescent maternal healthcare. The relative risk of being an adolescent mother, healthcare behavior, and odds ratio have been worked out.

Determinants of Adolescent Childbearing: We have worked out the parameters of adolescent childbearing in the country between 1992-93 and 2005-06 using demographic, individual and social and economic components of their

regulator and it has been presented in Table-9. Between NFHS-1 and NFHS-3, demographic variables like age of women and first age at marriage have been found highly significant in shaping the adolescent childbearing behaviour in the country. Age of marriage shows high variability when controlling for economic factors like standard of living of the households. However, data is not available for NFHS-1, and so it has not been presented for 1992-93. Similarly at the time of NFHS-1, the probability of childbearing was very high among the women who got married below the age of 18 years (OR: 9.5, $p > 0.005$) but the relative risk reversed at the time of NFHS-2 and NFHS-3, when the women who were getting married above the age of 15 years were at highest risk. It was found that education plays a major role in shaping demographic behaviour in the country, and an attempt was made here to observe its effect in determining childbearing behaviour. It has been found that in NFHS-2 and 3, the risk of childbearing was high among women who were illiterate, and as the education level increases the risk reduces and it is highly significant. However, in NFHS-1, the risk was found high even among women who were highly educated compared to women who had primary or no education. Considering the standard of living, it was found that women who had low standard of living had 28 percent more risk ($p > 0.005$) of childbearing compared to women with high standard of living. Though the caste of the women was not found significant across the periods, the lower castes like scheduled castes and scheduled tribes were at higher risk compared to the rest. Place of residence and regional pattern also have been found significant in shaping childbearing in the country.

Table-9: Determinants of Adolescent Childbearing by background characteristics

Characteristics	NFHS-1		NFHS-2		NFHS-3	
	Exp β	p Value	Exp β	p Value	Exp β	p Value
Age of Women						
18 years & Above[®]						
<18 years	0.288	0.000	3.989	0.000	4.178	0.000
Age at Marriage						
18 years & Above[®]						
<18 years	9.557	0.000	0.102	0.000	0.056	0.000
Educational Attainment						
Secondary & Higher[®]						
No Education	0.656	0.000	1.591	0.000	1.285	0.002
Primary	0.741	0.000	1.471	0.000	1.124	0.186
Religion of Women						
Muslim[®]						
Hindu	0.682	0.000	1.380	0.000	1.244	0.024
Standard of Living index						
High[®]						
Low	@	@	1.281	0.014	1.228	0.033
Medium	@	@	1.149	0.136	0.999	0.993
Social Group of Women						
Other[®]						
SC	0.845	0.013	1.028	0.727	1.354	0.004
ST	0.740	0.000	1.057	0.552	1.156	0.248
OBC	@		0.834	0.006	1.056	0.549
Place of Residence						
Urban[®]						
Rural	1.178	0.018	0.839	0.021	0.894	0.223
Regions						
South[®]						
North	1.841	0.000	0.555	0.000	0.933	0.605
Central	1.762	0.000	0.837	0.014	1.138	0.207
East	1.450	0.000	0.747	0.000	1.144	0.174
Northeast	0.686	0.008	1.053	0.754	1.562	0.024
West	0.732	0.000	1.119	0.222	1.482	0.002
Constant	0.910	0.661	0.943	0.808	1.124	0.695

@ Data Not Available on SLI for NFHS-1 and also for OBC caste group.

Determinants of adolescent pregnancy:

Data provided in Table-10 shows the determinants of pregnancy at the time of survey among adolescent women, and here we have also tried to observe the determinants during 1992-93 to 2005-06. Demographic variables like age and marriage age have been found significant for NFHS-1 and NFHS-3 but not for NFHS-2. It has been found that women who get married before the age of 18 years are at higher risk of being pregnant (OR:

1.26, $p < 0.02$) compared to those who married after 18 years of age. Educational attainment, religion, standard of living and rural-urban differentials and caste group differentials have not been found significant for the risk of being pregnant under the model. However, among social groups, scheduled caste women have been found to be at higher risk of being pregnant (18 per cent in NFHS-2 and 10 per cent in NFHS-3).

Table-10: Determinants of adolescent pregnancy with first child

Characteristics	NFHS-1		NFHS-2		NFHS-3	
	Exp β	p Value	Exp β	p Value	Exp β	p Value
Age of Women						
18 years & Above[®]						
<18 years	0.649	0.000	0.940	0.421	1.416	0.001
Age at Marriage						
18 years & Above[®]						
<18 years	1.266	0.026	1.138	0.437	0.814	0.071
Educational Attainment						
Secondary & Higher[®]						
No Education	1.203	0.074	0.855	0.111	0.852	0.163
Primary	0.874	0.247	0.941	0.588	0.922	0.507
Religion of Women						
Muslim[®]						
Hindu	0.901	0.349	1.185	0.122	1.198	0.169
Household Standard of Living index						
High[®]						
Low	@	@	0.914	0.552	0.954	0.726
Medium	@	@	1.037	0.799	0.821	0.093
Social Group of Women						
Other[®]						
SC	1.014	0.896	0.910	0.387	1.041	0.777
ST	0.679	0.003	1.177	0.219	1.109	0.550
OBC	@	@	1.033	0.733	0.757	0.020
Place of Residence						
Urban[®]						
Rural	1.253	0.028	0.954	0.647	0.926	0.524
Regions						
South[®]						

North	1.822	0.000	1.210	0.234	0.568	0.002
Central	2.055	0	1.445	0.000	0.686	0.006
East	1.334	0.004	1.802	0.000	0.840	0.180
Northeast	1.002	0.994	1.913	0.005	0.630	0.110
West	1.561	0.002	1.021	0.860	0.808	0.208
Constant	2.347	0.004	1.255	0.536	0.381	0.007

@ Data Not Available on SLI for NFHS-1 and also for OBC caste group.

Ante-Natal Care among adolescent women: Table-11 delineates the determinants of ante-natal care among adolescent women. Studies conducted on the subject have depicted that maternal healthcare, mainly ANC, has a major role in shaping obstetric health. Here, most of the factors considered in the model have been found significant except for religion. Early age at marriage was found to be having very poor performance on ANC, and at the time of NFHS-1, it was found that among those whose age at marriage was less than 18 years, 77 percent ($p>0.005$) were less likely to use ANC services at the time of pregnancy. But, surprisingly at the time of NFHS-2, the

reverse situation was found, and the model shows that among those who get married before age 18, 60 percent were more likely to use ANC services. Standard of living is highly significant for utilization of ANC services, and as the standard of living increases the utilization also increases. Similarly, at the time of NFHS-2, 15 percent more women with better standard of living were using ANC services compared to women with lower standard of living. The same has been found on caste and place of residence parameters. At the time of NFHS-3, less women from rural areas (OR: 0.75, $p>0.005$) had utilized the services compared to urban ones.

Table-11: Determinants of ANC among Adolescent women

Characteristics	NFHS-1		NFHS-2		NFHS-3	
	Exp β	p Value	Exp β	p Value	Exp β	p Value
Age of Women						
18 years & Above[®]						
<18 years	0.923	0.334	1.064	0.476	0.785	0.063
Age at Marriage						
18 years & Above[®]						
<18 years	0.341	0.000	1.597	0.025	0.665	0.184
Educational Attainment						
Secondary & Higher[®]						
No Education	4.983	0.000	0.288	0.000	0.309	0.000
Primary	1.526	0.033	0.622	0.001	0.894	0.545
Religion of Women						
Muslim[®]						
Hindu	1.036	0.748	0.845	0.175	0.912	0.602

Standard of Living index						
High[®]						
Low	@	@	0.481	0.000	0.367	0.000
Medium	@	@	0.632	0.009	0.491	0.000
Social Group of Women						
Other[®]						
SC	1.213	0.067	0.719	0.008	0.498	0.001
ST	2.059	0.000	0.428	0.000	0.577	0.017
OBC	@	@	0.667	0.000	0.376	0.146
Place of Residence						
Urban[®]						
Rural	1.591	0.000	0.434	0.000	0.757	0.000
Regions						
South[®]						
North	8.443	0.000	0.109	0.000	0.174	0.000
Central	8.657	0.000	0.088	0.000	0.226	0.000
East	5.441	0.000	0.207	0.000	0.110	0.000
Northeast	9.826	0.000	0.286	0.000	0.077	0.000
West	2.547	0.000	0.556	0.001	0.161	0.000
Constant	0.036	0.000	131.487	0.000	702.593	0.000

@ Data Not Available on SLI for NFHS-1 and also for OBC caste group.

Place of delivery among adolescent women: Information on place of delivery, i.e., institutional delivery among adolescent women at three different points of time or over the period 1992-93 to 2005-06, are provided in Table-12. It is clear from the table that among the factors considered for the model to depict the determinants for place of delivery, age at marriage, educational attainment, religion, standard of living, and place of residence have been found to be highly significant to significant in choosing institutional delivery among women in the age group of 15-19 years. Educational attainment and standard of living are positively linked to institutional delivery from 1992-93 to 2005-06. Similarly, during NFHS-1 and NFHS-2, uneducated women rarely

utilized institutional delivery – 0.14, ($p>0.005$) and 0.32, ($p>0.005$) respectively. However, over the period, institutional delivery has increased. However, it is interesting to mention here that at the time of NFHS-3, women with secondary level of education and above had fewer institutional deliveries compared to illiterate or primary educated women. Place of residence factor shows that although institutional delivery has increased in rural areas, the probability of use of institutions for delivery is much less there compared to urban areas. This may also be due to poor availability and accessibility of delivery facilities in rural areas of the country compared to urban areas.

Table-12: Determinants of Place of Delivery among adolescent women

Characteristics	NFHS-1		NFHS-2		NFHS-3	
	Exp β	p Value	Exp β	p Value	Exp β	p Value
Age of Women						
18 years & Above[®]						
<18 years	1.021	0.833	0.982	0.843	4.181	0.000
Age at Marriage						
18 years & Above[®]						
<18 years	1.874	0.003	1.524	0.022	0.056	0.000
Educational Attainment						
Secondary & Higher[®]						
No Education	0.138	0.000	0.322	0.000	1.283	0.002
Primary	0.449	0.000	0.684	0.001	1.128	0.175
Religion of Women						
Muslim[®]						
Hindu	0.670	0.001	0.561	0.000	1.243	0.024
Household Standard of Living index						
High[®]						
Low	@	@	0.355	0.000	1.227	0.034
Medium	@	@	0.524	0.000	0.991	0.921
Social Group of Women						
Other[®]						
SC	0.837	0.000	0.719	0.010	1.357	0.003
ST	0.440	0.000	0.376	0.000	1.158	0.243
OBC	@	@	0.834	0.097	1.053	0.570
Place of Residence						
Urban[®]						
Rural	0.232	0.000	0.303	0.000	0.904	0.272
Regions						
South[®]						
North	0.218	0.000	0.274	0.000	0.931	0.594
Central	0.214	0.000	0.213	0.000	1.136	0.212
East	0.383	0.000	0.404	0.000	1.134	0.202
Northeast	0.182	0.000	0.222	0.000	1.557	0.025
West	0.680	0.002	0.569	0.000	1.469	0.003
Constant	31.143	0.000	58.662	0.000	1.103	0.741

@ Data Not Available on SLI for NFHS-1 and also for OBC caste group.

Complication during last pregnancy among adolescent women: Table-13 explains the complications during pregnancy for NFHS-2 and NFHS-3. It shows that at the time of NFHS-2, women who were below the age of 18 years were at higher risk of pregnancy complications (OR: 1.32, $p > 0.005$) compared to those above 18 years. Nevertheless, at the time of NFHS-3, women aged 18 years and above faced higher risk of pregnancy-related complications compared to women who were younger. Hindu women faced more pregnancy-related complications compared to Muslim women. Place of residence shows that women in rural areas experienced less pregnancy-related problems compared to urban women.

During NFHS-3, the odds ratio of pregnancy complication was 0.62 ($p > 0.005$) among adolescent women in rural areas. Regional dynamics of pregnancy-related complications shows that except for the western region, all regions compared to the southern region had higher risk of pregnancy-related complications. On the other hand, women from the eastern region experienced four times ($p > 0.005$) more complications during pregnancy compared to women from the southern region. However, at the time of NFHS-2, the women of southern region experienced a higher percentage of pregnancy-related complications compared to the other regions.

Table-13: Complications during Pregnancy among adolescent women

Characteristics	NFHS-2		NFHS-3	
	Exp β	p Value	Exp β	p Value
Age of Women				
18 years & Above[®]				
<18 years	1.320	0.002	0.843	0.114
Age at Marriage				
18 years & Above[®]				
<18 years	0.907	0.357	0.890	0.650
Educational Attainment				
Secondary & Higher[®]				
No Education	0.981	0.847	0.711	0.002
Primary	1.087	0.452	0.900	0.412
Religion of Women				
Muslim[®]				
Hindu	1.343	0.010	1.220	0.150
Household Standard of Living index				
High[®]				
Low	1.000	0.999	1.076	0.591
Medium	1.023	0.854	0.993	0.955
Social Group of Women				
Other[®]				
SC	1.018	0.880	1.112	0.471
ST	1.038	0.794	1.085	0.639
OBC	0.865	0.132	1.450	0.005

Place of Residence				
Urban[®]				
Rural	0.829	0.077	0.619	0.000
Regions				
South[®]				
North	0.663	0.007	1.212	0.301
Central	0.561	0.000	1.676	0.000
East	0.678	0.000	4.062	0.000
Northeast	0.823	0.414	1.862	0.015
West	0.880	0.340	0.964	0.832
Constant	0.326	0.001	2.091	0.123

Conclusion

The findings of the study show that marriage of girls at young ages is declining. Secondly, girls given in marriage before 20 years of age are going down. This is because marriage of girls at young ages leads to teenage pregnancy and motherhood. Young women who become pregnant and give birth experience a number of health problems as well as social, economic and emotional problems. In addition to higher levels of pregnancy complications among young mothers because of physiological immaturity and inexperience associated with child care practices, marriages at young ages also affect maternal and child health. Thirdly, women educational attainment, religion, standard of living and rural-urban differentials and caste group differentials in relative risk of being pregnant have not

been found significant. However, among the social groups, scheduled caste women have been found to face an 18 per cent higher risk of being pregnant. Early marriage leads to very poor performance on ANC. Educational attainment and standard of living are positively linked to institutional delivery. Place of residence shows that although over a period of time, institutional deliveries have increased in rural areas the probability of use of institutions for delivery is much less compared to urban areas. Regional dynamics of pregnancy-related complications show that except for the western region, all regions had a higher risk of pregnancy-related complications compared to the south. Also, women from the eastern region experienced four times more complications during pregnancy compared to women from the southern region.

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