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Breastfeeding in Rural Northern India : Levels and Differentials

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Introduction

Studies on breast feeding have been a subject of great concern in both developed and developing countries because of its important implication, not only for improving the health condition of children, but also for lowering fertility. It is well known that human fertility behaviour functions within a biological framework, but a number of socio-economic, demographic, psychological, and cultural factors also affect it. Breast feeding is one which affects fertility by prolonging the duration of post partum amenorrhea and hence, length of related birth interval. In a society where prevalence rates of modern contraception are low, duration of breast feeding is considered to be an important determinant of marital fertility. Suckling stimulus of breast feeding has been found to be the main cause of its effect in the reduction of fertility, and the frequency, intensity and timing of suckling all determine the extent of this effect (Guz and Hobcraft, 1991). It has been reported that the length of ovulation depends on the duration of breast feeding, especially the intensity and frequency of suckling and also depends on both the retum of menstruation and resumption of normal sexual relations (Santow 1987; Trussel et al. 1992).

Studies looking into the impact of breast feeding on fertility have related it with the duration of post partum amenorrhea (PPA). Habicht et al. (1985) have

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mentioned that breast feeding beyond the resumption of menstruation can not affect the duration of PPA and an estimated effect of breast feeding on fertility may be biased. Whereas McNeilly et al. (1985) have pleaded that continued breast feeding may further delay resumption of ovulation and interfere with the frequency of menstrual cycles.

Some of the factors associated with differentials in breast feeding have been region, place of residence, rural/urban, education, social status, mother's age, parity, use of contraception, employment status, etc. (Guidkey et al. 1990; Jain and Bongaarts, 1981; Knodel et al. 1982; Trussell et al. 1992). An overtime declining pattern in the mean duration of breast feeding has also been found, but reaching to a point of near universal (Anh et al. 1995 ; Chayovan et al. 1990;).

However, differentials and determinants of the duration of breast feeding discussed in numerous studies have shown that an accurate estimate of trends in breast feeding is not straightforward. Studies conducted in different countries around the world, at different points of time, are not comparable as they vary in questions asked, birth order taken, and methodology of analysis used (Trussell et al. 1992). Extended and demand breast feeding is prevalent in India, night breast feeding is common as the child sleeps with the mother. The longer and more frequent breast feeding is, perhaps, used to ensure the survival of the child (Caldwell and Caldwell 1977).

In all the studies, either the 'retrospective' reporting or the 'current status' reporting of the breast feeding (BF) data have been used. In the present study, both of these data have been utilized for studying the levels and differentials in the duration of BF. The retrospective reporting in this survey refers to asking the mother her duration of BF subsequent to the birth of her last but one child, whereas the current status reporting entails noting mother's BF status at the survey date following the birth of her last child. In this paper the known differentials of the mean duration of BF with some explanatory variables have been confirmed as well as some new differentials have been investigated. The data for this study is taken from five villages of the Eastern Uttar

Pradesh collected in 1995. Both univariate and multivariate statistical techniques are used.

Data and Methodology

Data collection was undertaken in 1995 in five villages which were randomly selected and were completely enumerated around Varanasi, a district in the state of Uttar Pradesh, India. The survey schedule included questions on the household composition, household facilities, and household belongings. Marriage, migration, fertility, morbidity, and mortality occurred in the households during specific periods in the past were recorded. A separate section in the schedule was devoted to seeking additional information on births, particularly the last and the last but one birth that occurred to couples in the household during the seven years preceding the survey date (March 1995). Married women aged under 50 years and living with their husbands at the survey date provided the fertility, breastfeeding, post-partum amenorrhea, birth intervals, and family planning information.

The survey collected information from 1,022 households, 1,060 mothers about their last birth, and 767 mothers about their last but one birth. Information on the duration of breast feeding following the last birth and the last but one birth was collected by asking direct questions to mothers: 'How many months was a child on the mother's breast milk only? How many months a child breast fed along with supplementary food?' Some mothers did not started weaning by the survey date and their experience was, therefore, censored (For details see Yadava and Jain, 1998).

The dependent and independent variables

The duration of breast feeding (BF) in completed months is used as the dependent variable. The independent variables, all measured at the survey date, are classified as follows:

Demographic variables

The variables included are: post partum amenorrhea (PPA), last closed birth interval (CLOSE), open birth interval (OPEN), age of mother (AGEMOTH), age of mother at the birth of the child (AGEMOTC), age at return marriage (AGERM), parity of mother (PARITY), age of child (AGECH), survival status of child (CHALIVE), and sex of child (SEX).

The PPA is the period following the termination of a pregnancy during which conception does not occur. It is measured in completed months. The censored cases of the independent duration variable PPA have been allocated a duration equivalent to OPEN. OPEN is the interval between the last birth and the survey date. CLOSE is defined as the time period between the penultimate child and the most recent child. All birth interval variables are measured in completed months.

AGEMOTH, AGEMOTC and AGERM were all measured in completed years. The AGERM is the age at which a couple starts living together for consummation after a ceremony known as Gauna, which may be performed after several years of marriage. The AGECH is measured in completed months. CHALIVE is classified as alive if the last but one child or the last child was alive at the time of occurrence of the next event (i.e. at birth of the next child or at the survey date respectively), and dead if the child was dead before the occurrence of the next event.

Socio-economic variables

The variables included are: type of household (HHTYPE), status of house (HOUSE). Main occupation of the household (OCCHH), economic status of the household (ECONHH), social status of the household (SOCIALHH), education of wife (EDUW), and education of husband (EDUH).

Except for education, the other variables in this group were computed at the household level. A household was defined as a group of persons who resided together and took food from a common kitchen, inclusive of persons who lived outside the village but claimed the household to be of their own. The inclusion of the household level variables in the rural context of the study area is considered appropriate as the

behaviour of an individual is influenced by not only her/his characteristics alone but also by the characteristics of the household to which she/he belongs. People in the household take part in the economic and social activities together, share joys of social living, have strong feelings of mutual obligation during crisis and identify their interest with the household welfare.

HHTYPE is defined as nuclear - comprising of one couple and their children, and joint - comprising more than one couple and their children, HOUSE is classified as Kaccha (made of mud), Pukka (made with bricks), or Mixed. OCCHH refers to occupation that mostly contributed to the income of the household. ECONHH was defined according to the value of a composite income index (CII) which took into account information on several variables included in the survey. The index is defined as follows:

CII = Total income of the household / Effective size of the household

The total income in Rupees (Indian currency) of the household was derived by adding its monthly income from all possible sources viz. Agriculture, service, household industries, and business. The effective size of the household was calculated by considering each person aged 15 years and over in the household as one unit, and less than 15 years old as half a unit. The low, middle and high ECONHH is based on the average monthly income per earning unit of the household are: Low (0<=CII<300), Middle (300<=CII<500) and High (CII>=500).

Like the economic status, the social status of the household was quantified by taking into account the following available facilities in the household: (i) total income in excess of Rs 3,000 per month, (ii) land possession in excess of 3.125 acres, (iii) residential accommodation more than one 'Pukka room' per eligible couple, (iv) regular use of milk and vegetables, (v) education at graduate level of at least one member of the household, and (vi) possession of at least two out of the following facilities: (a) drinking water - well / hand pump / pumping set, (b) entertainment source / radio / television / v.c.r., (c) transportation - bicycle / scooter / car / jeep, (d) luxurious items - fan / cooler / fridge / heater, (e) agricultural equipment - ox / plough / tractor, (f)

kitchen facilities / gas chulaha (stove) / bio-gas chulaha, (g) other facilities - electricity / toilet.

The social status of the household (SOCIALHH) is, then, defined as: Low: if at most one facility (out of i to vi) is available in the household, Middle: if two or three facilities are available in the household, High: if four or more facilities are available in the household.

Both education variables EDUW and EDUH are categorised according to the years of schooling as follows: (i) illiterate (no schooling), (ii) primary (1 to 5 years), (iii) middle (6 to 8 years), (iv) high (9 to 10 years), and (v) inter + (class 11 years and over).

Cultural variables

Two variables included are religion (RELIGION) and caste (CASTE). Religion is split into two categories as Hindus and Muslims. Caste forms a cultural classification in India and plays an important role in examining the characteristics of the population. In our survey, 87 per cent of the households were Hindu and the remaining were Muslim households. The Hindu households consisted of about 35 castes. These castes were stratified into four groups on the basis of their homogeneity as per the pattern of living, performing social activities, and their relative position in the rural society. Muslim households, being small in number (13%), were not divided into categories. The caste groups, therefore, are:

(i) High caste - landlords, relatively well educated, living in joint family system, economically well off,

(ii) Middle caste - mostly agriculturists,

(iii) Business caste - mostly landless, involved in business of any kind,

(iv) Scheduled caste - relatively less educated, economically poor, labourers,

(v) Muslims.

Distribution of the BF

Figure 1 shows the distribution of the duration of breast feeding among mothers of the last child and the last but one child cohorts. Both child cohort indicate heaping in the breast feeding duration at the multiple of 6 months. A similar pattern of heaping in the breast feeding duration has also been reported in various other studies conducted in India (Singh, 1993; Sriniwasan et al., 1989), Bangladesh (Mannan and Islam, 1995), Indonesia (Jones, 1989), Africa (Amenuvegbe, 1994) and many other developed and developing countries (Trussell et al. 1992). The reasons for the heaping in the duration of breast feeding data reported by these studies are: misreporting, culturally prescribed norms, memory lapse and selection bias. No adjustment for heaping of the breast feeding data was made in the present study. However, multimodal distributions could, in fact, be obtained even though all respondents report their breast feeding durations accurately because each subgroup in the population has a different unimodal distribution. Nevertheless, it is difficult to detect the systematic tendencies of under reporting and over reporting in the breast feeding duration unless the errors are gross (Amenuvegbe, 1994).

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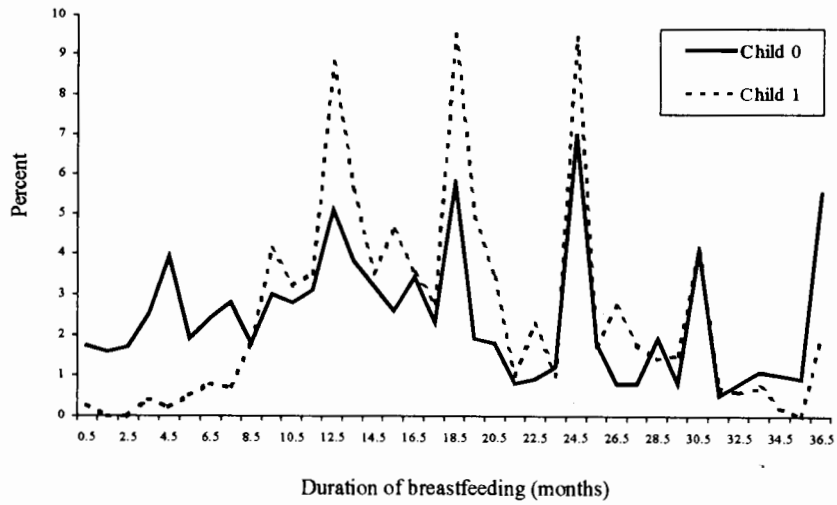
PERCENT AGE DISTRIBUTION OF DURATION OF BREASTFEEDING



For bivariate analysis of the breast feeding, the duration of BF is grouped in 6 monthly intervals. All other variables are grouped as shown in Table 3 and Appendix. Assuming that breast feeding started soon after the birth, the censored cases of the duration dependent variable (BF) have been allocated a duration which is the same as the age of the child at the survey date. The mean duration of BF is computed from ungrouped data after making it a continuous variable (by adding 0.5 to each reported duration in completed months).

The association of the duration of BF with all the variables included in this study is first checked by the Chi-square statistic in a two-way tabulation of each variable (Table 1). Chi-square statistic has also been used to test the goodness of fit of the model as well as to test the significance of the explanatory variables.

The Survival analysis (Life table) is used to examine the duration probabilities of the weaning according to the characteristics of the mothers and children. The survival analysis calculates the probability distribution of mothers who continue to be in the breast feeding state at specific BF duration since the birth of the child. Various summary measures based on this distribution have also been calculated (see Appendix Table).

The univariate proportional hazard model analysis is used to give a measure of the effect of each variable on the duration-specific probabilities of the weaning (hazard function) in the absence of the control for other variables (Table 2).

Table 1 Two-Way Analysis of BF vs Various Explanatory Variables

VARIABLE	ALL CASES (n=1060) LAST CHILD CHI-SQ DF	Value	Prob	ALL CASES (n=767) LAST BUT ONE CHILD CHI-SQ DF	Value	Prob
PPA	9	108.355	0.001	9	39.089	0.001
OPEN	9	972.470	0.001	9	11.805	0.225
CLOSE	9	13.409	0.145	9	135.275	0.001
PARITY	9	35.363	0.001	9	5.111	0.825
AGECH	9	1240.940	0.001	9	45.315*	0.001
AGEMOTH	6	169.224	0.001	6	6.379	0.382
AGEMOTC	6	46.931	0.001	6	2.435	0.876
AGERM	6	22.814	0.001	6	4.424	0.620
EDUH	9	10.081	0.344	9	14.440	0.108
EDUW	6	16.275	0.012	6	9.085	0.169
RELIGION	3	15.098	0.002	3	3.097	0.377
CASTE	12	23.732	0.022	12	28.221	0.005
HHTYPE	3	4.529	0.210	3	6.069	0.108
OCCHH	6	9.968	0.126	6	3.016	0.237
HOUSE	6	10.160	0.118	6	40.880	0.001
ECONHH	6	19.805	0.003	6	6.297	0.391
SOCIALHH	6	6.311	0.389	6	14.556	0.024
SEX	3	7.900	0.048	3	2.082	0.556
CHALIVE	3	5.560	0.135	3	87.392*	0.001

* Expected frequency in some cells is less than 5.

Table 2 Univariate Analysis of the Risk of Weaning - Last and Last but One Child using the Proportional Hazard Model on Selected Variables

Model	Last Child (n=1060, censored =485) -2 Log L with covariates	Model chi-sqare	D.F.	P	Last but one child (n=767, censored =45) -2 Log L with covariates	Model chi-sqare	D.F.	P
NULL	6718.533				8438.870			
PPA	6711.721	6.812	3	0.0781	8429.714	9.156	3	0.0273
OPEN	6715.074	3.459	3	0.3261	8436.793	2.077	3	0.5563
CLOSE	6717.562	0.971	3	0.8083	8390.049	48.821	3	0.001
PARITY	6715.122	3.410	3	0.3326	8436.270	2.600	3	0.4575
AGEMOTH	6713.269	5.264	2	0.0719	8438.489	0.381	2	0.8266
AGEMOTC	6714.621	3.912	2	0.1414	8438.320	0.550	2	0.7595
AGERM	6710.001	8.531	2	0.0140	8435.081	3.789	2	0.1504
EDUH	6700.812	17.721	3	0.005	8425.271	13.599	3	0.0035
EDUM	6692.520	26.013	3	0.001	8433.944	4.926	2	0.0853
RELIGION	6715.910	2.623	1	0.1053	8438.776	0.094	1	0.7590
CASTE	6704.165	14.368	4	0.0062	8425.055	13.815	4	0.0079
HHTYPE	6717.437	1.096	1	0.2951	8434.872	3.998	1	0.0455
OCCHH	6716.764	1.769	2	0.4129	8438.582	0.288	2	0.8659
HOUSE	6712.814	5.718	2	0.0573	8408.612	30.258	2	0.001
ECONHH	6697.935	20.598	2	0.001	8434.218	4.653	3	0.0977
SOCIALHH	6708.061	10.471	2	0.0053	8429.670	9.200	2	0.0100
SEX	5718.380	0.152	1	0.6963	8438.866	0.005	1	0.9462
CHALIVE	6694.399	24.133	1	0.0001	8324.173	114.697	1	0.0001
AGECH	6712.511	6.022	3	0.1105	8414.896	33.974	3	0.001

A multivariate proportional hazard model analysis is then undertaken to provide a measure of the effect of each category of each variable on the hazard function while controlling for the effects of other variables (and their categories) included in the model (Table 3).

Analysis is carried out separately for the BF distribution following the birth of the last and the last but one child cohort. Some explanatory variables which were inter-related were excluded from the multivariate hazard modeling.

Table 3 Multivariate Proportional Hazard Model Analysis - Breastfeeding

Variable	Group	LAST CHILD Risk Ratio	p	LAST BUT ONE CHILD Risk Ratio	p
PPA	0-2				
	3-5	1.473	0.0234	1.053	0.7030
	6-8	1.126	0.4297	0.882	0.3245
	9+	0.897	0.2786	0.771	0.0070
OPEN	0-11				
	12-23	0.863	0.7270		
	24-35	1.757	0.1777		
	36+	3.023	0.0025		
CLOSE	0-23				
	24-35			0.541	0.0001
	36-47			0.335	0.0001
	48+			0.320	0.0001
PARITY	1-2				
	3-4	1.067	0.6523	1.204	0.1052
	5-6	1.163	0.3905	1.162	0.3711
	7+	1.347	0.1602	1.277	0.2472

Table 3 (Continued)

Variable	Group	LAST CHILD Risk Ratio	p	LAST BUT ONE CHILD Risk Ratio	p
AGEMOT	16-24				
	25-34	0.701	0.0471	0.901	0.4320
	35+	0.708	0.1336	0.943	0.7470
AGEMOC	10-24				
	25-34	0.942	0.6824	1.108	0.3900
	35+	0.737	0.1665	1.076	0.7467
AGERM	9-14				
	15-17	1.036	0.7636	1.003	0.9793
	18+	1.293	0.0864	1.018	0.8988
EDUH	ILLITERATE				
	PRIMARY	1.340	0.0246	0.981	0.8629
	MID-HIGH	0.855	0.2603	1.054	0.6570
	INTER+	0.966	0.8337	1.088	0.5695
EDUW	ILLITERATE				
	PRIMARY	1.239	0.1262	0.898	0.3849
	MIDDLE+	1.477	0.0170	0.998	0.9897
RELIGION	HINDU				
	MUSLIM	0.616	0.4326	0.469	0.0739
CASTE	HIGH				
	MIDDLE	0.936	0.6287	1.144	0.3276
	BUSINESS	0.809	0.2149	0.995	0.9721
	SCH. CASTE	1.121	0.5109	0.878	0.4091
	MUSLIMS	2.165	0.221	2.500	0.0441
HHTYPE	JOINT				
	NUCLEAR	0.945	0.5875	1.094	0.3576
OCCHH	AGRICULTRE				
	SERVICE	1.236	0.1925	0.904	0.5110
	DOMESTIC	1.103	0.5100	0.895	0.4419
HOUSE	KACCHA				
	PUKKA	0.903	0.4658	1.175	0.1547
	MIXED	1.002	0.9908	1.187	0.1726

Table 3 (Continued)

Variable	Group	LAST CHILD Risk Ratio	p	LAST BUT ONE CHILD Risk Ratio	p
ECONHH	LOW				
	MIDDLE	0.934	0.5752	0.950	0.6062
	HIGH	1.204	0.1903	1.098	0.4527
SOCIATHH	LOW				
	MIDDLE	1.126	0.3634	1.068	0.5270
	HIGH	1.213	0.2835	0.930	0.6537
SEX	MALE				
	FEMALE	1.043	0.6422	0.969	0.6891
CHALIVE	ALIVE				
	DEAD	0.259	0.0001	0.048	0.0001
AGECH	0-11				
	12-23	0.799	0.6461	0.240	0.0623
	24-35	0.345	0.0281	0.159	0.0133
	36+	0.254	0.0017	0.150	0.0103
N		1060		767	
CENSORED		485		45	
- 2 LOG L (NULL)		6718.533		8438.870	
- 2 LOG L (MODEL)		6596.888		8149.661	
MODEL CHI-SQ		121.645		289.209	
D.F.		42		42	
P		0.0001		0.0001	

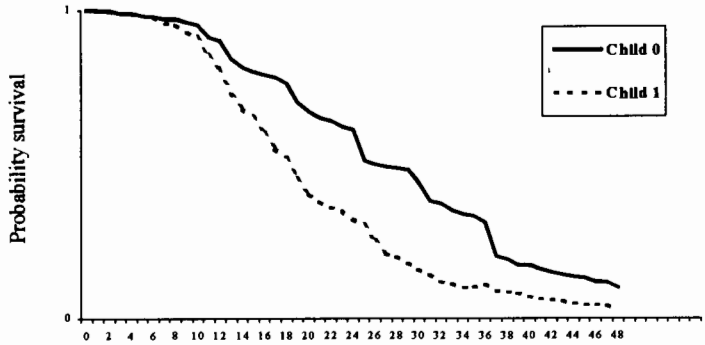
Results and Discussion

Distribution of the duration of BF

The ordinary mean, median, and range for duration of the BF were 20.5, 18.5, 72 months (in case of the last child) and 20.8, 18.5, 72 months (in case of the last but one child) respectively. However, survival analysis, when censoring of the duration of breast feeding is taken into account, revealed a higher mean duration of the BF (about 25 months) for mothers in respect of the last child than (about 19 months) for mothers in respect of the last but one child (Appendix Table). This may be due to a high per cent of censored cases (about 46%) in the last child cohort. The censored cases averaged a mean duration of BF of 16.4 months in case of the last child and 46.2 months, though small in number, in case of the last but one child, and hence it turned into a higher mean duration of BF in data of the last child cohort. This happened because of the fact that survival analysis provides, theoretically, a higher value of probabilities at the later categories of breast feeding duration due to censoring (Trussell et al. 1992).

The two survival curves of the distribution of the duration of breast feeding differed significantly from one another (Figure 2). A universal pattern in the BF data was found as there were only 1.2% mothers in the last child and 1.6% in the last but one child cohort whose duration of the BF was less than 6 months. About 32% and 10% mothers respectively in the last and the last but one child cohort continued breast feeding even after 36 months which shows a pattern of prolonged breast feeding in the region under study. The median duration of the BF distribution was 26.3 and 18.5 months respectively in last and the last but one child cohort.

Figure 2
SURVIVAL CURVES BASED ON LIFE TABLE ANALYSIS



As compared to some Indian studies, this study reported a slightly shorter mean duration of the BF. Singh (1993), for example, reported, based on a sample data of last but one child, a mean duration of breast feeding of 19.6 months in rural area, and 17.9 months in urban area of eastern Uttar Pradesh, whereas Sriniwasan et al. (1989), based on the data of the last child in Orissa, showed a median duration of 28.6 months in rural area and 23.8 months in urban area. Some other studies in developing countries reported a median duration of breast feeding which varies from 14 to 24 months (in last closed birth interval), from 18 to 31 months (in open birth interval) in West African countries Cameroon, Benin, and Ghana (Amenuvegbe, 1994), from 22 to 32 months in Bangladesh (Mannan and Islam, 1995; Salway et al. 1993) and around 17 months in Vietnam (Anh et al. 1995). Thus, this study showed an almost universal pattern of breast feeding in rural Northern India, but a tendency to decline in the duration over time.

Breast feeding and Demographic Variables

BF in relation to Post-Partum Amenorrhoea

During the last more than three decades data are being collected on the durations of breast feeding and post partum amenorrhea, and a positive relationship

between the two has been developed (Guz and Hobcraft 1991; Jain and Bongaarts 1981; Yadava and Jain, 1988). A simple two way tabulation revealed a relationship of the PPA with the distribution of the duration of BF (Table 1). The duration of BF across the different PPA groups exhibited a positive, but a J-shaped relationship (Figure 3). This shows that there are two types of mothers in the society, one who even with a shorter duration of the PPA breast fed for a longer duration.

FIGURE 3

Mean Duration of Breastfeeding by Characteristics of Women

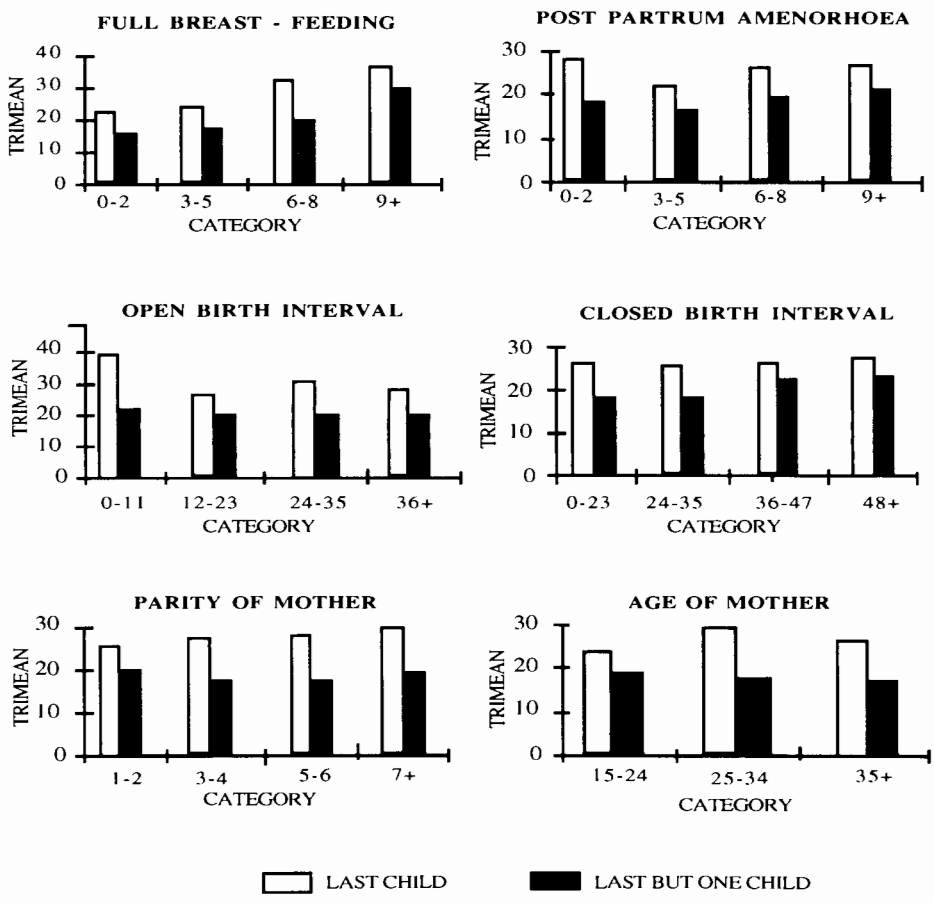
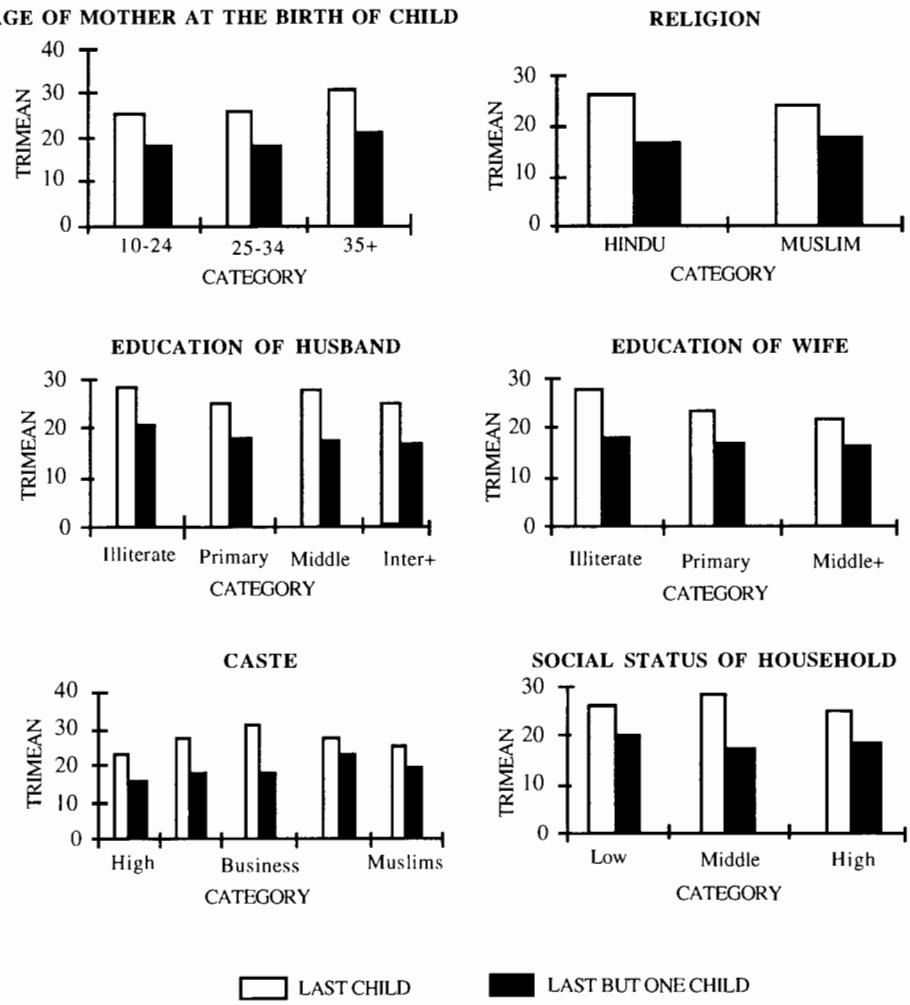


FIGURE 3 (Cont.)

Mean Duration of Breastfeeding by Characteristics of Women



Survival analysis shows that about 2 and 3 per cent mothers in last and last but one child cohort respectively, terminated BF during first 6 months who had experience of 0-2 months of the PPA, whereas only about 1 per cent mothers did so in each child cohort who were amenorrhoeic for 9+ months. The mean duration of BF across the different PPA groups increased from a low value of 22.9 months in respect of

the last child and 16.9 months in respect of the last but one child, for mothers who were amenorrhoeic for 3-5 months, to a high value of 26.3 and 21.9 months for those mothers who had experience of more than or equal to 9 months of PPA in respective child cohort.

Univariate proportional hazard analysis also showed a significant impact of the PPA on the hazard function of the BF in respect of the last but one child (Table 2). This pattern was maintained in the multivariate proportional hazard model analysis. An insignificant effect in respect of the last child may be due to a high per cent of censoring. Thus, this study confirms a relationship between the duration of breast feeding and the duration of post partum amenorrhea.

BF in relation to Birth Intervals

Though the role of breast feeding in describing the pattern of length of birth interval has been discussed and a positive relationship has been found between the two (Amenuvegbe, 1994; Mannan and Islam, 1995; Singh, 1993; Trussell et al. 1992), studies dealing with the reverse pattern are scant, In this section, differentials in the mean duration of the BF have been studied across the duration of the last closed birth interval (CLOSE) and open birth interval (OPEN). The distribution of the duration of BF was found significantly related with the CLOSE in respect of the last but one child, and with the OPEN in respect of the last child (Table 1). The mean duration of BF was found lengthened by the increase in the length of CLOSE. The mean duration of the BF in CLOSE groups 0-23, 24-35, 36-47, and 48+ were found to be 14.6, 19.3, 23.5, and 23.7 months respectively. About 70% of mothers terminated breast feeding who had a CLOSE of 0-23 months, much higher than about 26% who terminated the BF in the CLOSE of 36-47 months. This study, however, showed that the closed birth interval after a certain length of duration has little or no impact on the duration of the BF. For example, the CLOSE after 36 months has no significant effect on the BF (see Figure 3).

Univariate proportional hazard model analysis exhibited a high relationship between CLOSE and the duration of the BF (Table 2). Even after controlling the effects

for other explanatory variables (multivariate hazard analysis), a significant relationship exit between the two (Table 3). This implies a strong relationship between the length of the last closed birth interval and the duration of breast feeding. The mean duration of the BF was extended by the increase in the length of OPEN. It is a minimum of 18.8 months in OPEN 0-11 months and a maximum of 25.5 months in OPEN 24-35 months. Like CLOSE, the duration of the BF was not very much affected by OPEN after 36 months (see Figure 3). Though the univariate hazard model exhibited no significant relationship between the two, multivariate hazard analysis shows that the risk ratio for mothers whose OPEN was over 36 months was significant than for those whose OPEN was less than 36 months (Table 3). However, due to high per cent of censored cases it is difficult to conclude on the effect of OPEN on the duration of breast feeding.

BF in relation to Parity and Age Variables

A variable related to age is, usually, used to control for cohort (to see variation over time) and/or looking for variation in fecundability (e.g. older females may breast feed for a longer duration due to less chance of becoming pregnant) (Trussell et al. 1992). Several authors reported a higher duration of the BF with age of mother and birth order of child (Huffman et al 1980: Mannan and Islam 1995), while some others found no significant association of the BF with these variables (Amenuvegbe 1994; Sriniwasan et al. 1989).

Last child cohort's breast feeding differentials averaged a low value of 22.2 months among mothers of age 16-24 years, to a maximum of 25.7 months for mothers aged 35 and above. The last but one child data revealed a similar pattern. The hazard of terminating the BF among mothers of both the child data sets appeared similar across the AGEMOTH. Both univariate and multivariate hazard model analyses, however, exhibited insignificant relationship between the variable AGEMOTH and the duration of the BF, except in the last child data set where mother aged 24-34 years showed a significantly different and longer duration of the BF than mothers aged 16-24 years (Table 3).

Mother's age at the birth of the child (AGEMOTC) shows a similar pattern of differentials in the BF as found according to AGEMOTH in both set of data. Though a simple two way tabulation showed a significant association between the BF duration and the AGEMOTC for mothers in the last child (Table 1), the hazard model analyses did not reveal any significant association between these two (Tables 2 and 3).

PARITY demonstrates a similar pattern of association with the duration of the BF as found with AGEMOTC. The mean duration of BF was increased by the increase in the PARITY. For example, mothers with parity 1-2 breast fed for an average of about 24 months in the last child cohort, and 19 months in the last but one child cohort, which rose linearly to about 27 months and 20 months respectively, in the last and the last but one child cohorts who were of parity 7 and above. However, the effect of PARITY in explaining the duration of the BF, estimated through proportional hazard model analyses, was found insignificant in both child cohorts.

The differential in the duration of BF by age at return marriage (AGERM) shows an inverse relationship. Mothers breast feed on the average 27.3 months in respect of the last child, and 20.6 months in respect of the last but one child whose AGERM was 9-14 years, while those who married at aged 18 and above breast feed for a shorter period of 23 months and 18.6 months in last and last but one child cohort respectively. However, like other age variables, AGERM has a significant relation with the distribution of the duration of the BF in respect of the last child (Table 1), its estimated effects, based on hazard model analyses, were not significant in both data sets.

BF in relation to Sex, Age and Survival Status of the Child

As expected, a significant association between the duration of BF and survival status of a child (CHALIVE) was found in data sets. Mothers stop breast feeding just after the death of the child, which obviously results in a shorter duration of breast feeding. Mothers, whose child was alive until the occurrence of the next event (birth or survey date), breast fed on average for a longer duration (25.1 months in case of the last child and 19.2 months in case of the last but one child) than those whose child was found dead (21.4 and 16.6 months in case of last child and the last but one child

respectively). Both univariate and multivariate hazard model analyses also revealed a highly significant association between these two (Tables 2 and 3).

Both child cohorts showed no evidence of marked differentials in the duration of BF by SEX of the child. As may be expected, the present age of child (AGECH) has a positive relationship with the breast feeding duration in both the data sets. However, due to a high per cent of censored cases in the last child cohort, and small number of observation in some cells of the last but one child, it is not worth studying the relationship of the variable AGECH with the duration of the BF.

Breast feeding and Socio-economic Variables

BF in relation to Education

Socio-economic status of women have been found highly relative to the duration of breast feeding in developing countries. Education is one of the important factors of measuring socio-economic status of a society. Due to low level of literacy among females in India, education of the husband has been considered by some of the researchers as a proxy of the socio-economic status to study the differentials in the breast feeding duration (eg. Singh 1993). The effect of education on the duration of BF has shown mixed evidences. In many developing countries (Bangladesh, Colombia, India, Indonesia, Jordan, Panama and Sri Lanka), breast feeding duration is found inversely related with education, i.e. risk of early weaning increases with education (Anh et al. 1995; Hufman et al. 1980; Jain and Bongaarts, 1981; Singh, 1993; Sriniwasan et al. 1989), whereas in many developed countries, educated females breast feed for a longer duration (Trussell et al. 1992). The husband's education has also been found related with the duration of breast feeding (Singh 1993). Education of mother (EDUW) was found related with the duration of BF in both the data sets (Table 1). The mean duration of the BF increased by the decrease in the educational level of the mothers (Figure 3).

For example, illiterate mothers breast feed on the average 26.1 months in respect of the last child, and 19.7 months in respect of the *last but* one child, which

linearly decreased to 22 months in the last and 18.5 months in the *last but* one child cohort respectively, for mothers educated more than or equal to middle standard. Survival analysis shows that the percentage of the illiterate mothers who terminated breast feeding at 36 months was lower (62.3% in the last child and 88.8% in the *last but one* child) than those who were highly educated (middle+) (87.2% in the last child and 95.1% in the last but one child). Univariate proportional hazard model analysis exhibited a significant contribution of EDUW in explaining the duration of the BF in both child cohort (Table 2), more so in last child cohort. The multivariate hazard model analysis shows that the risk ratio for mothers whose education was middle and above was more significant than for those who were illiterates in respect of the *last* child. However, the difference in the duration of breast feeding pattern between illiterate mothers and primary level educated mothers was not found to be significant in both data sets (Table 3).

The husband's education (EDUH) has also been found related to the duration of the BF (Table 1). The mean duration of BF decreased with the increase in the level of the husbandís education (Figure 3). The mean duration of the BF was found to have decreased from 25.4 and 20.4 months in *last* child and in *last but one* child cohort, for mothers having illiterate husbands, to 23.6 and 18.3 months in respective child cohort, for mothers having husbands with higher education, Inter+ (12 class or more). The univariate proportional hazard model analysis revealed that EEDUH has an impact on the hazard function of the BF (Table 2). However, after controlling the effects of the other explanatory variables, the variable EDUH has its significant impact on the duration of BF except in the last child data, where mothers of illiterate husbands had significantly a different BF than mothers having husbands with education at the primary level (Table 3).

BF in relation to Household Level Variables

Mothers living in joint households averaged slightly higher duration of the BF than for those living in nuclear households in respect of the both child cohort. Similarly, mothers belonging to the OCCHH group agriculture averaged slightly less

duration of the BF than for mothers of other occupations. However, variables HHTYPE and OCCHH were found to significantly relate with the distribution of the duration of BF. Univariate and multivariate hazard analyses had revealed not a significant effect of HHTYPE and OCCHH on the duration of BF, except in respect of the last but one child were univariate hazard model provided some impact of the HHTYPE on the hazard function of BF (Tables 2 and 3).

Status of house (HOUSE) appears to have some mixed evidence regarding its association with the duration of the BF. It was related with the distribution of the duration of BF in respect of the last but one child but not with the last child (Table 1). Mothers living in the Kaccha houses breast fed on average a longer period than those belonged to Pukka or Mixed houses. Though, univariate hazard model analysis revealed a significant impact of this variable on the duration of BF in both data sets (Table 2), multivariate hazard analysis revealed no differentials in the duration of BF across the status of house (Table 3).

The variables ECONHH and SOCIALHH exhibited some zigzag pattern of relationship with the distribution of BF. ECONHH was found related with BF in respect of the last child, whereas SOCIALHH was found related with BF in respect of the last but one child (Table 1). It was found that mothers of low ECONHH and low SOCIALHH breast feed on the average a higher duration than other mothers (Appendix Table). The duration of BF was found increased by the increase in the social and economic status of the household. The univariate hazard model analysis also revealed that both the variables have an impact on the hazard function of BF (Table 2). However, their estimated contribution, after controlling the effects of the other explanatory variables, in explaining the duration of BF was not significant in both data sets (Table 3). The household level variables, thus, have no significant influence on the duration of breast feeding.

BF In relation to Cultural Variables

Two variables CASTE and RELIGION are discussed in this section. The variation in the duration of the BF according to CASTE and RELIGION has been

observed in many development countries like India (Sriniwasan et al. 1989), Bangladesh (Mannan and Islam, 1995), and Ghana (Amenuvegbe, 1994). The variable CASTE was found related with the distribution of BF in both the data sets, whereas the variable RELIGION was related only in data of the last child (Table 1). Differentials in the duration of BF by CASTE show that high caste's mothers breast feed on average for a shorter duration (23 months in the last child cohort and 18.4 months in the *last but one* child cohort) compared to other castes. Scheduled castes mothers were found to breast feed for a longer duration. The univariate hazard model analysis revealed a significant impact of the variable CASTE on the BF (Table 2). However, after controlling the effects of the other explanatory variables, its effect disappeared. The variable RELIGION exhibited that the Hindus females breast feed on the average a slightly longer duration than Muslims. Both univariate and multivariate hazard models, however, did not find any significant association between the two variables RELIGION and BF.

Retrospective and Current Status BF data

As mentioned in previous sections, the level (mean, median or trimean) of the duration of BF and its demographic, and socio-economic correlates were calculated from both the 'retrospective' and 'current status' data. It was noted that while the differentials in the duration of BF by characteristics of women or child, were identical in these two types of BF data, the level of the duration of BF was quite different. The mean duration of BF was 20.5 months in respect of the last child (current status data) and 20.8 months for the last but one child (retrospective data). Further, the mean duration of BF subsequent to the birth of the *last but one* and the *last child* of the same mother (725 mothers), who reported a median duration of BF of 19.3 months following the birth of the last but one child, and 20.8 months following the birth of the last child also revealed a statistical difference between the risk ratios for the last and the last but one child of these mothers. The survival analysis technique, which took into account the censoring of the cases revealed a higher median (26.3 months) and trimean (26.8

months) of the duration of BF for the last child than for the *last but one* child (median 19.4 and trimean 18.8 months). Inclusion of a variable BLAST, indicating whether the child was the *last* or the *last but one*, in the proportional hazard model analysis revealed significant difference between the risk ratio for the last and the *last but one* child (not shown in this paper), which confirmed that even after the control for the demographic and socio-economic covariates, BF distributions for the birth of the *last* and the *last but one* child were different.

It is to be pointed out that the 'current status' data had better coverage but had censored cases, whereas the 'retrospective' had missed information for some mothers. For example, there were 199 women who had given birth to two or more children but not reported the duration of BF for the last but one child in this survey. In both types of data, the reporting of the duration of BF might be influenced by not remembering it correctly. The recall lapses may be higher for births which occurred a long time ago i.e. 'in retrospective' reporting. On balance, it appears that the 'current status' data are better for providing estimates of the median duration of BF than the 'retrospective' data.

Conclusions

The study showed nearly an universality in the pattern of breast feeding in a rural part of Northern India but a slightly lower mean duration of breast feeding than the preceding Indian studies. Both data sets exhibited a pattern of heaping in the distribution of the duration of breast feeding at the multiple 6 months. Nearly 1 per cent mothers terminated their BF during the first 6 months following the birth of each the *last* as well as the *last but one* child cohort. In case of the last child, about 46 per cent of the mothers had not terminated their BF by the survey date. These cases were censored.

Old age mothers of the higher parity breast fed for a longer duration than others, but not a difference of significant level.

Both the wife's and husband's education was inversely associated with the duration of breast feeding. Illiterate mothers, or those whose husbands were illiterate, breast fed for a longer duration than others. However, after controlling for the effects of the other explanatory variables, the influence of the husband's education becomes statistically insignificant.

Mothers living in joint and Kaccha households, or in households having social and economic status, averaged a longer duration of breast feeding than those living in other types of households. However, the household level variables were not significantly related with the duration of breast feeding.

Survival status of the child had a significant impact on the duration of breast feeding. The sex of the child showed no differentials in breast feeding duration. High caste mothers breast fed for a shorter duration than other castes. Statistically not significant, but Hindus mothers breast fed for a longer duration than Muslims.

Overall, the findings of this study demonstrate that mothers living in upper strata of the society breast fed for a shorter duration than their counterpart.

This study provided an opportunity to examine the duration of the BF in respect of the *last but one* child (ie 'retrospective' data) and the last child (i.e. 'current status' data) which had 6% censoring. There is debate in the literature as to which of these two types of data give better estimate of the mean duration of BF. As noted, the mean duration of BF was longer in the case of the current status data (i.e. BF following the birth of the last child) than 'retrospective' data (i.e. BF following the the birth of the last but one child).

The 'retrospective' data missed information on some mothers who provided information about their last child in the 'current status' data. Additionally, if there was a change in the duration of the BF with time, the 'current status' data would catch that

change, whereas the 'retrospective' data would miss it (Trussell et al, 1992). The reporting bias may occur in both types of data sets, but probably these may be higher in the 'retrospective' data due to the longer recall period. Thus, on balance it appears that the 'current status' data provide a better source than the 'retrospective' data for the analysis of the duration of BF.

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References

Amenuvegbe, B.E. 1994. "Reproductive change in Ghana : evidence from two national surveys", Ph.D. thesis in Demography Programm, ANU, Canberra, Ch.7.

Anh, T. Si, Hoe, N.T. Thai, Knodel, J., Huong, Le and Thuy, Tran T. T. 1995. "Infant feeding practices in Viet Nam", *Asia-Pacific Population Journal,* Vol.10(4), 3-22.

Caldwell, J.C. and Caldwell, P. 1977. "The role of marital sexual abstinence in determining fertility : a study of the Yoryba in Nigeria", *Population Studies,* Vol.31, pp.193-217.

Chayovan, N., Knodel, J. and Wongboonsin, K. 1990. "Infant feeding practices in Thailand : An update from the 1987 Demographic and Health Survey", *Studies in Family Planning,* Vol.21(1), pp.40-50.

Guilkey, D.K., Popkin, B.M., Flieger, W. and Akin, J.S. 1990. "Changes in breastfeeding in the Philippines, 1973-1983". *Social Science and Medicine,* Vol. 31(12), pp. 1365-1375.

Guz, D, and Hobcraft, J. 1991. "Breastfeeding and fertility : A comparative analysis", *Population Studies,* Vol.45, pp.91-108.

Habicht, J.P., DaVanzo, J., Butz, W.P. and Meyers, L. 1985. "The contraceptive role of breastfeeding" , *Population Studies,* Vol.39, pp.213-232.

Huffman, S.L., Chowdhury, A.K.M.A., Chkraborty, J. and Simpson, N.K. 1980. "Breastfeeding patterns in rural Bangladesh", *American Journal of Clinical Nutrition,* Vol.33(1), pp.144-154.

Jain, A.K. and Bongaarts, J. 1981. "Breastfeeding : Patterns, correlates, and fertility effects", *Studies in Family Planning,* Vol.12, pp.79-99.

Jones, R.E. 1989. "Breast-feeding and post-partum amenorrhea in indonesia", *J. Biosoc. Sci.,* Vol.21(1), pp.83-100.

Knodel, J., Kamnuansila, P. and Chamratrithirong, A. 1982. "Breastfeeding in Thailand : Data from the 1981 contraceptive prevalence survey", *Studies in Family Planning,* Vol.13(11), pp.307-315.

Mannan, H.R. and Islam, M.N. 1995. "Breast-feeding in Bagnladesh : patterns and impact on fertility", *Asia Pacific Population Journal,* Vol.10(4), pp.23-38.

McNeilly, A.S., Glasier, A. and Howic, P.W. 1985. "The endocrine control of lactational in fertility", In Dobbing (eds) Maternal Natural and Lactational Infertility, New York : Nestle Nutrition Series, 1-24.

Salway, S., Roy, N.C., Koenig, M.A. and Cleland, J. 1993. "Levels and trends in post-partum amenorrhea, breast-feeding and birth intervals in Matlab. Bangladesh : 1978-1989", *Asia Pacific Population Journal,* Vol.8(2), 3-22.

Santow, G. 1987. "Reassessing the contraceptive effect of breastfeeding", *Population Studies.* Vol.41(1), pp.147-160.

Singh, S.N. 1993. "Breastfeeding and its effect on fertility", Center of Population Studies. Banaras Hindu University, Varanasi.

Srinivasan, K., Pathak. K.B. and Pandey, A. 1989. "Determinants of breast-feeding and post-partum amenorrhea in Orissa", *J. Biosoc. Sci.,* Vol.21(3), pp.363-371.

Trussell, J., Strawn, L.G., Rodriguez, G. and Vanlandingham, M. 1992. "Trends and differentials in breastfeeding behaviour : Evidence from the WFS and DHS", *Population Studies,* Vol.46, pp. 285-307.

Yadava, K.N.S. and Jain S.K. 1998. "Post partum Amenorrhea in rural Eastern Uttar Pradesh, India", *Journal of Biosocial Sciences,* Vol30, pp.227-243.

Appendix Table

Survival Analysis of Breastfeeding

CHILD	BLAST	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	0	1060	45.75	1.2	8.7	23.7	37.2	54.5	68.0	25.0	18.2	26.3	36.6	26.8	18.4
L. BUT ONE	1	767	5.87	1.6	16.0	44.9	66.1	83.9	90.0	19.4	13.1	18.5	25.0	18.8	11.9

CHILD	variable PPA	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	0-2	478	49.58	1.9	11.5	24.9	36.6	54.0	67.7	24.6	18.0	26.9	36.7	27.1	18.7
	3-5	117	61.54	0.0	17.3	34.7	54.7	68.0	77.8	22.9	13.6	19.9	35.2	22.2	21.5
	6-8	113	46.90	0.0	10.2	30.8	46.3	59.7	73.7	23.9	15.8	24.6	36.3	25.3	20.5
	9+	352	34.94	1.2	3.6	18.5	32.2	51.3	65.1	26.3	18.8	28.5	36.7	28.1	18.0
L. BUT ONE	0-2	373	8.04	2.7	22.0	48.3	70.8	86.2	89.5	18.1	12.4	18.2	24.5	18.3	12.2
	3-5	78	6.41	0.0	16.7	66.7	78.2	87.4	93.6	16.9	12.5	15.6	22.5	16.5	10.0
	6-8	87	5.75	0.0	13.8	43.7	65.5	83.9	90.8	19.5	13.6	18.5	26.1	19.2	12.5
	9+	229	2.18	0.9	7.0	32.3	54.6	79.0	89.1	21.9	15.8	20.8	26.9	21.1	11.1

CHILD	variable open	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	0-11	245	93.06	1.2	30.3	37.1	37.1	47.6	47.6	18.9	13.6	38.2	70.7	40.2	57.1
	12-33	215	70.23	0.5	5.7	22.1	44.1	57.7	72.8	23.9	18.3	24.4	37.2	26.1	18.9
	24-35	156	43.59	1.3	5.4	20.3	31.7	52.0	62.6	25.5	18.9	28.7	46.3	30.7	27.4
	36+	444	8.56	1.6	9.8	24.8	37.8	54.8	68.7	24.9	18.0	25.8	36.5	26.5	18.5
L. BUT ONE	0-11	185	7.08	0.5	14.6	39.5	59.4	79.0	87.9	21.3	13.5	19.0	27.4	19.7	13.9
	12-23	167	8.98	1.8	19.6	50.3	71.3	85.1	88.2	17.7	12.6	17.9	24.5	18.2	11.9
	24-35	145	5.52	1.4	17.2	40.7	63.4	86.2	92.7	19.4	13.3	19.0	25.0	19.0	11.7
	36+	270	3.33	2.2	14.8	47.4	68.9	85.2	91.2	19.1	13.1	18.3	24.6	18.6	11.5

CHILD	Variable CLOSE	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	0-23	318	52.20	1.4	9.8	21.1	36.3	55.6	67.0	24.8	18.6	25.6	37.0	26.7	18.4
	24-35	409	46.70	0.5	7.4	25.2	37.2	54.8	70.2	24.6	17.8	25.9	36.4	26.5	18.6
	36-47	180	40.00	1.2	8.3	28.3	39.8	53.1	66.8	25.6	16.2	28.4	36.5	27.4	20.3
	48+	153	36.60	2.8	10.5	19.5	36.1	54.0	66.0	25.6	18.6	27.1	36.9	27.4	18.3
L. BUT ONE	0-23	222	10.36	3.6	32.0	69.9	82.9	87.9	91.1	14.6	10.8	13.7	18.7	14.2	7.9
	24-35	324	4.32	0.9	11.1	38.3	68.5	90.4	94.1	19.3	15.1	18.9	24.6	19.4	9.5
	36-47	133	3.76	0.0	4.5	25.6	45.1	73.7	88.0	23.5	17.6	24.4	30.2	24.2	12.5
	48+	88	3.41	1.1	11.4	35.2	46.6	63.6	73.0	23.7	13.6	24.3	36.2	24.6	22.6

CHILD	variable PARITY	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	1-2	313	53.67	1.8	10.5	26.6	40.1	61.4	75.7	23.9	16.5	24.9	35.8	25.5	19.3
	3-4	348	43.68	0.9	9.5	24.9	39.4	54.7	68.4	24.6	18.0	25.6	36.7	26.5	18.7
	5-6	239	39.75	1.3	8.6	24.6	35.5	51.5	61.5	25.4	18.1	28.2	36.9	27.9	18.9
	7+	160	43.75	0.7	4.2	15.0	30.9	49.2	66.1	27.0	20.6	30.1	36.6	29.4	16.0
L. BUT ONE	1-2	296	7.77	1.7	13.9	41.9	64.8	82.5	89.8	19.4	13.5	18.8	25.7	19.2	12.2
	3-4	262	3.05	1.5	17.9	47.7	66.0	86.7	91.6	19.2	12.7	18.2	24.8	18.5	12.2
	5-6	124	6.45	1.6	15.3	46.0	70.2	84.9	89.9	19.5	13.3	18.3	24.6	18.6	11.4
	7+	85	7.06	1.2	18.8	44.7	65.1	78.4	86.1	19.8	13.2	19.1	26.1	19.4	12.9

CHILD	variable AGECH	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	0-11	245	95.10	1.3	16.7	44.5	44.5	72.2	72.2	16.7	13.3	24.2	71.0	33.2	57.7
	12-23	208	69.71	0.5	6.7	25.6	48.1	61.1	87.0	22.2	17.7	24.1	34.1	25.0	16.4
	24-35	142	45.07	0.7	4.9	19.0	01.7	50.8	64.5	22.1	19.5	29.4	70.8	37.3	51.3
	36+	465	9.25	1.7	9.9	24.3	36.8	54.2	67.1	24.9	18.1	25.9	36.7	26.7	18.6
L. BUT ONE	0-11	2	0.00	0.0	50.0	50.0	50.0	50.0	50.0	6.5	6.5	7.0	70.5	22.8	64.0
	12-23	27	11.11	3.7	29.6	70.9	93.5	93.5	93.5	14.0	11.4	14.5	18.4	14.7	7.0
	24-35	116	9.48	2.6	26.7	51.7	75.9	88.1	92.9	16.6	11.8	17.3	22.8	17.3	11.0
	36+	622	4.99	1.3	13.2	42.3	63.2	82.5	89.1	19.9	13.5	18.8	26.0	19.3	12.5

CHILD	variable AAGEMOTH	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	16-24	283	68.55	2.1	9.8	28.0	44.3	72.2	83.3	22.2	16.4	24.4	30.7	24.0	14.3
	25-34	422	54.27	0.5	9.0	25.0	36.9	50.2	67.0	25.0	18.0	29.9	36.9	28.6	18.9
	35+	355	17.46	1.4	7.8	20.6	34.6	52.9	65.2	25.7	18.5	26.8	36.7	27.2	18.2
L. BUT ONE	16-24	165	9.70	3.6	20.0	46.7	70.1	85.4	90.2	17.9	12.6	18.3	24.8	18.5	12.1
	25-34	197	5.54	0.8	14.1	44.6	66.3	84.5	90.8	19.5	13.2	18.5	24.9	18.8	11.7
	35+	205	3.41	1.5	16.6	43.9	62.4	81.5	88.3	20.1	13.2	19.0	25.9	19.2	12.7

CHILD	variable AGEMOTC	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	10-24	450	55.78	1.5	10.3	26.3	40.3	61.5	74.1	23.5	17.0	24.8	36.1	25.7	19.1
	25-34	507	38.86	1.2	8.2	23.4	36.6	52.2	66.7	25.3	18.2	27.1	36.7	27.3	18.5
	35+	103	35.92	0.0	5.3	16.5	29.9	45.5	56.3	27.9	21.1	32.1	40.2	31.4	19.1
L. BUT ONE	10-34	423	5.91	1.7	15.6	43.8	66.4	84.4	90.8	19.2	13.3	18.6	25.2	18.9	11.9
	25.-34	303	5.94	1.6	16.2	45.9	66.1	84.7	89.5	19.4	12.9	18.4	24.8	18.6	11.9
	35+	41	4.88	0.0	19.5	48.8	63.4	73.2	85.4	20.3	13.1	19.3	30.2	20.5	17.1

CHILD	variable AGERM	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD	9-14	206	39.32	1.5	7.3	20.0	30.4	44.9	59.2	27.3	19.0	30.7	36.9	29.3	17.9
	15-17	570	48.95	0.7	8.3	23.3	36.4	53.8	66.4	25.1	18.3	27.3	36.7	27.4	18.4
	18+	184	44.01	2.0	10.6	27.5	44.7	64.7	78.7	23.0	15.7	24.4	32.9	24.4	17.3
L. BUT ONE	9-14	146	4.11	1.4	13.0	39.1	64.0	79.4	89.6	20.6	13.4	18.8	28.3	19.8	14.8
	15-17	420	6.90	1.7	15.5	43.8	64.6	84.1	89.8	19.3	13.4	18.7	25.0	19.0	11.5
	18+	201	4.98	1.5	19.4	51.3	70.9	86.6	90.6	18.6	12.5	17.6	24.5	18.0	12.0

CHILD	variable EDUH	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	ILLITERATE	313	47.60	1.0	9.4	22.8	35.0	47.6	63.1	25.4	18.4	30.3	38.3	29.3	19.9
	PRIMARY	217	47.00	1.5	8.8	23.9	40.9	57.3	69.8	25.3	18.2	24.9	36.5	26.1	18.3
	MID-HIGH	268	50.37	0.8	5.7	23.5	31.4	46.7	60.2	26.1	18.5	30.4	36.9	29.1	18.4
	INTER+	262	37.79	1.6	10.8	24.9	42.5	67.7	79.3	23.6	18.0	24.4	34.0	25.2	16.0
L. BUT ONE															
	ILLITERATE	245	8.57	0.8	13.5	39.6	60.6	77.2	84.5	20.4	13.7	19.5	28.4	20.3	14.7
	PRIMARY	171	6.43	1.2	15.8	45.7	66.3	83.8	90.2	19.6	13.2	18.6	26.2	19.2	13.0
	MID-HIGH	199	4.52	2.0	17.1	48.2	68.4	86.8	92.6	18.8	13.0	18.2	24.7	18.5	11.7
	INTER+	152	2.63	2.6	19.1	48.0	71.7	90.9	95.4	18.3	12.4	18.2	24.3	18.3	11.8

CHILD	variable EDUM	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	ILLITERATE	703	48.22	0.8	7.9	21.3	33.3	48.0	62.3	26.1	18.7	30.3	37.0	29.1	18.3
	PRIMARY	158	42.41	2.7	10.0	28.6	37.7	60.8	69.1	24.3	15.1	24.8	36.4	25.3	21.3
	MID-HIGH	199	39.70	1.6	10.5	28.8	51.6	73.7	87.2	22.0	14.9	22.2	30.2	22.4	15.4
L. BUT ONE															
	ILLITERATE	532	6.20	1.5	16.4	43.4	63.7	82.1	88.8	19.7	13.3	18.8	26.0	19.2	12.8
	PRIMARY	109	6.42	1.8	12.8	51.4	69.7	86.2	90.0	18.5	12.9	17.5	25.7	18.4	12.7
	MID-HIGH	126	3.97	1.6	17.5	45.2	73.3	89.5	95.1	18.5	12.7	18.3	24.1	18.4	11.5

CHILD	variable RELIGION	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	HINDU	946	44.50	1.1	8.1	23.0	36.3	53.7	66.9	25.3	18.3	26.9	36.7	27.2	18.4
	MUSLIM	114	56.14	2.0	14.2	30.3	46.7	64.2	79.8	22.3	16.2	24.4	33.3	24.6	17.1
L. BUT ONE															
	HINDU	672	5.80	1.6	15.9	44.2	65.8	84.5	90.7	19.4	13.1	18.6	24.9	18.8	11.8
	MUSLIM	95	6.32	1.1	16.8	49.5	68.4	80.0	85.3	19.3	12.9	18.2	26.3	18.9	13.4

	variable			BREAST FEEDING AT MONTHS						SUMMARY MEASURES (MONTHS)					
CHILD	CASTE	N	CENSORED	6	12	18	24	30	36	MEAN	01	02	03	TM	03-01
LAST CHILD															
	HIGH	221	31.22	2.4	11.9	27.3	42.6	63.7	78.6	23.0	15.5	24.5	34.5	24.7	19.0
	MIDDLE	389	45.50	0.3	6.2	21.8	34.1	51.1	64.5	26.1	18.6	28.6	36.7	28.1	18.1
	BUSINESS	155	54.19	1.4	6.5	16.8	27.6	44.0	57.6	28.1	19.9	32.6	38.0	30.8	18.1
	SCH. CASTE	187	51.34	1.1	8.6	25.4	39.9	52.2	60.9	24.8	16.8	28.0	37.5	27.6	20.8
	MUSLIMS	108	54.63	2.1	14.6	29.7	47.1	66.0	92.2	22.2	16.1	24.3	32.4	24.3	16.3
L. BUT ONE															
	HIGH	125	4.80	3.2	22.4	48.8	68.8	85.0	91.9	18.4	12.3	18.2	24.6	18.3	12.3
	MIDDLE	290	4.83	1.7	19.0	47.6	69.4	86.9	93.1	18.7	12.7	18.2	24.6	18.4	11.9
	BUSINESS	112	3.57	0.0	9.8	47.3	63.4	85.9	92.9	20.3	13.9	18.4	26.4	19.3	12.5
	SCH. CASTE	150	10.67	1.3	9.3	30.7	56.5	77.3	82.3	21.3	15.5	20.9	27.6	21.2	12.1
	MUSLIMS	90	5.56	1.1	16.7	51.1	71.1	81.1	86.7	18.8	12.7	17.5	24.9	18.1	12.2

	variable			BREAST FEEDING AT MONTHS						SUMMARY MEASURES (MONTHS)					
CHILD	HHTYPE	N	CENSORED	6	12	18	24	30	36	MEAN	01	02	03	TM	03-01
LAST CHILD															
	JOINT	502	45.02	1.1	9.7	24.8	36.0	52.5	65.6	25.5	18.0	28.2	36.8	27.8	18.8
	NUCKEAR	559	46.42	1.4	7.8	22.5	38.5	56.6	70.2	24.6	18.3	25.0	36.4	26.2	18.1
L. BUT ONE															
	JOINT	402	6.72	1.0	13.4	43.8	63.5	81.0	88.5	19.8	13.4	118.8	26.1	19.3	12.7
	NUCKEAR	365	4.93	2.2	18.9	46.1	69.0	87.1	91.6	18.9	12.7	18.3	24.7	18.5	12.0

	variable			BREAST FEEDING AT MONTHS						SUMMARY MEASURES (MONTHS)					
CHILD	OCCHH	N	CENSORED	6	12	18	24	30	36	MEAN	01	02	03	TM	03-01
LAST CHILD															
	AGRICULTRE	122	43.44	4.5	12.6	25.7	34.4	48.9	65.3	23.6	17.4	30.1	36.9	28.6	19.5
	SERVICE	334	50.30	1.3	11.4	25.6	38.4	52.2	68.3	24.9	17.6	27.5	36.8	27.3	19.3
	DOMESTIC	60.4	43.71	0.5	6.5	22.3	37.1	56.8	68.3	25.5	18.4	25.2	36.5	26.3	18.2
L. BUT ONE															
	AGRICULTRE	78	8.97	2.6	21.8	53.8	70.5	82.3	86.6	18.0	12.3	16.7	25.2	17.7	13.0
	SERVICE	269	6.32	1.5	16.7	44.6	66.3	82.0	87.9	19.5	13.3	19.7	25.2	19.0	11.9
	DOMESTIC	420	5.00	1.4	14.5	43.4	65.2	85.4	92.1	19.5	13.2	18.6	24.9	18.8	11.7

CHILD	variable HOUSE	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	KACCHA	242	45.45	2.6	12.3	24.3	36.2	49.5	65.6	25.1	18.1	30.1	37.2	28.9	19.1
	PUKKA	338	54.44	0.0	4.6	19.9	37.7	50.3	61.5	25.8	18.6	28.9	36.9	28.3	18.3
	MIXED	480	39.79	1.3	9.7	26.0	37.6	59.5	72.6	24.5	17.4	24.9	36.2	25.8	18.9
L. BUT ONE															
	KACCHA	183	11.48	1.1	12.0	31.7	50.4	71.1	79.1	21.8	15.1	23.2	30.8	23.1	15.6
	PUKKA	253	4.35	0.8	17.0	47.4	68.2	86.2	93.5	19.4	12.8	18.3	25.1	18.6	12.3
	MIXED	331	3.93	2.4	17.5	50.2	73.1	89.2	93.4	18.1	12.8	18.0	24.2	18.2	11.4

CHILD	variable ECONHH	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	LOW	270	55.19	0.4	10..1	27.4	40.1	48.5	64.4	24.1	16.4	30.2	38.7	28.9	22.3
	MIDDLE	442	49.55	2.4	9.8	21.5	31.6	49.6	63.3	25.4	18.8	30.1	39.3	29.6	20.5
	HIGH	348	33.62	0.3	6.4	23.8	41.7	63.9	75.4	24.9	18.1	24.5	35.7	25.7	17.6
L. BUT ONE															
	LOW	218	6.42	0.5	14.2	43.6	66.7	82.7	87.6	19.7	13.2	18.6	25.2	18.9	12.0
	MIDDLE	341	7.33	2.1	16.7	43.7	63.2	81.2	89.4	19.6	13.0	18.7	26.5	19.2	13.4
	HIGH	208	2.88	1.9	16.8	48.1	70.2	89.5	93.5	18.6	12.9	18.2	24.4	18.4	11.5

CHILD	variable SOCTALHH	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	LOW	318	52.52	1.6	10.6	25.6	36.9	51.9	64.9	24.5	17.0	28.1	37.1	27.6	20.1
	MIDDLE	433	51.04	0.8	6.6	20.7	33.2	49.1	65.2	26.3	19.0	30.1	36.8	29.0	17.8
	HIGH	309	31.39	1.4	9.7	26.3	42.5	63.0	73.7	23.9	16.7	24.6	36.1	25.5	19.5
L. BUT ONE															
	LOW	155	7.45	1.2	12.5	37.7	58.2	79.5	86.6	20.6	13.7	19.7	27.4	20.1	13.7
	MIDDLE	323	7.12	0.9	18.0	49.8	70.2	84.4	89.9	18.8	12.8	18.0	24.9	18.4	12.1
	HIGH	139	1.59	3.2	17.5	46.0	69.8	88.9	94.7	19.7	12.8	18.3	24.4	18.5	11.6

CHILD	variable SEX	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	MALE	588	41.50	1.1	9.2	23.5	36.4	52.5	67.2	25.2	18.2	27.4	36.6	27.4	18.4
	FEMALE	472	51.06	1.4	8.0	24.0	38.4	57.6	69.1	24.8	18.1	25.0	36.7	26.2	18.6
L. BUT ONE															
	MALE	422	5.69	0.9	14.9	45.3	67.4	83.5	90.5	19.3	13.2	18.5	24.9	18.8	11.6
	FEMALE	345	6.09	2.3	17.4	44.4	64.5	84.4	89.4	19.5	12.9	18.7	25.1	18.8	12.2

CHILD	variable CHALIVE	N	CENSORED	BREAST FEEDING AT MONTHS 6	12	18	24	30	36	SUMMARY MEASURES (MONTHS) MEAN	01	02	03	TM	03-01
LAST CHILD															
	ALIVE	1012	44.27	1.3	9.0	24.3	37.8	55.1	68.9	25.1	18.1	25.9	36.5	26.6	18.4
	DEAD	48	77.08	0.0	2.8	9.2	21.5	40.0	45.0	21.4	24.2	70.9	70.3	59.1	46.1
L. BUT ONE															
	ALIVE	729	2.06	1.6	16.6	46.7	68.7	86.8	92.9	19.2	12.9	18.3	24.7	18.6	11.7
	DEAD	38	78.95	0.0	5.3	10.5	16.0	21.7	21.7	16.6	70.8	69.7	68.5	69.7	-2.3