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Determinants of Breastfeeding Duration in Bangladesh: A Hazards Model Analysis

Introduction

THERE has been considerable research on the potential benefits of breastfeeding, particularly those related to the health of the infants and its role in controlling fertility. Breastfeeding offers immunological protection to an infant against early morbidity and mortality, and contraceptive protection to a mother against closely spaced pregnancies. Several surveys show that breastfed infants have a better pattern of growth and experience substantially lower morbidity and mortality risks than infants who are not breastfed, particularly in the first year of life (Palloni and Millman, 1986; Pebley and Stupp, 1986; Retherford *et al.,* 1989). Demographic analyses have demonstrated that in populations without access to modern forms of contraception, birth intervals are determined primarily by the duration of breastfeeding (Bongaarts and Potter, 1983). In view of such major benefits of breastfeeding, researches on the patterns of breastfeeding or on the factors, which influence these patterns, particularly, in low-income countries are receiving considerable interest. The purpose of this paper is to study the determinants of breastfeeding duration in Bangladesh, a country for which a dataset is available at the national level through the Bangladesh Fertility Survey (BFS).

Bangladesh is a thickly populated country (750 persons per sq km) having 2.17 per cent intercensal per annum growth rate of population according to the 1991 Population Census (Bangladesh Bureau of Statistics, 1992). Shortage of agricultural land and demand for jobs are leading to migration in cities and industrial areas. All these are making changes in the social values and cultural tradition in Bangladesh as is usual in any developing country. As a result the determinants of breastfeeding duration may also be expected to change over time. The importance of this work lies in the fact that this is the first study

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of breastfeeding determinants by Cox's proportional hazards model using national level data. Earlier, the determinants of breastfeeding duration in the national level was analysed by Jain and Bongaarts (1981) using data from the last closed interval on the basis of 1976 WFS data for Bangladesh by multiple classification analysis. But, the main limitation of analysis using such data set is that the retrospectively reported data in the last closed interval show digital preference for 6 or 12 months which is mainly due to recall error. For this reason, we have analysed the breastfeeding determinants by using a data set which is less prone to reporting bias. However, the justification for using proportional hazards model is discussed in the next section.

Data and Methodology

This study is based on the data extracted from the 1989 Bangladesh Fertility Survey (BFS) which was conducted on behalf of the Government of Bangladesh by the National Institute of Population Research and Training (NIPORT). Information was collected from a nationally representative sample of 11,906 ever married women under 50 years of age. Information on breastfeeding was collected for all children born six years preceding interview. The only information available about breastfeeding was the duration of any breastfeeding, that is, full plus partial breastfeeding. Information on timing of supplementation and types of supplements was not collected. A Total of 7,516 women provided information on breastfeeding duration of their last born child, of whom 198 (2.6 per cent) were reported to have never breastfed, 2050 (27.3 per cent) had already weaned by the date of interview, 381 (5.0 per cent) breastfed until death of the child and the remaining 4887 (65.0 per cent) were still breastfeeding at the date of interview.

More often than not the researchers have tended to choose the retrospectively reported data from the last closed interval or from the current open interval because these data can be analysed using familiar techniques. Most classic forms of regression analysis can be applied and the potential problems associated with censored data can be avoided. However, the retrospectively reported breastfeeding duration data in the last closed interval or current open interval show concentration of points at multiples of six or twelve months which may constitute a biased data set (Fig. 1). Such heaping is mainly due to errors in mother's recall (Page *etal.,* 1982). But, the current status data of breastfeeding duration in the current open interval donot show such concentration at multiples of six months (Fig. 1). On the other hand, women reporting at the last closed interval represent, at least partially, a self-selected group of short breast-feeders and thus add selection bias to the existing reporting bias. Furthermore, data for the last closed interval under-represent women with a longer than average birth interval, because these women have had less chance of having had their second birth (Page *et al.,* 1982; Weis, 1993). Data for the current open interval donot suffer from such limitations. That is why we have analysed the data by using a multivafiate statistical technique that incorporates both the current status and retrospective data of breastfeeding duration.

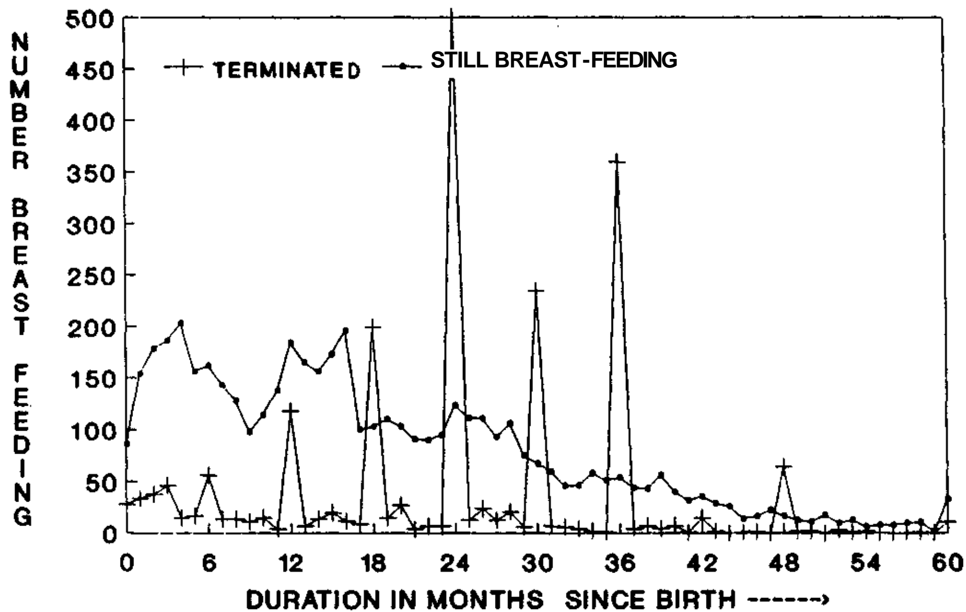

Fig. 1. Distribution of breastfeeding duration in the current open birth interval (BFS 89)

The information on breastfeeding duration in the current open interval is complete only for women who have already weaned at the time of interview while it is not complete for those who breastfeed until death of the child and are continuing breastfeeding at the time of interview. So for analysis of breastfeeding duration, women who breastfeed until death of the child and are still breastfeeding at the time of interview are considered as censored cases because their true durations can not be observed. In that case, it would be appropriate to use a multivariate technique that allows for the inclusion of both the censored and uncensored data of breastfeeding duration. Cox's proportional hazards model is appropriate for the analysis of data with censored observations. In this context, we have used a proportional hazards model with fixed covariates (Cox, 1972; Menken *et at,* 1981). In this model, we are interested in the hazard function which can be thought as the force of weaning. In other words, we analyze the probability at time, say *d* of a child being weaned in the next instant of time given that he or she has not been weaned prior to time *d*. The dependent variable is the time to weaning. The variables are considered statistically significant or insignificant on the basis of Mest. A variable is considered significantly associated with breastfeeding duration if its *p*-value is below 0.10.

The proportional hazards model assumes that all women with the same covariates have identical risks of termination of breastfeeding over the course of study, but these

risks may vary among the groups with different covariates. The hazards function enables one to estimate the relative risks of each variable by exponentiating the regression coefficients, exp (P). For the variable which is coded as dummy, each exponent of the coefficients exp ((3) represents the effect of the covariate on the hazard function for the reference group. The category with the relative risk 1.00 represents the reference category for the categorical variables. Value greater than one indicates that the relative risk of termination of breastfeeding is greater for this group compared with the reference group, while value less than one indicates a decrease in the risk (Jones, 1988).

Background Characteristics

The definitions of independent variables used in the analysis are given in Table 1. The descriptions of these variables are presented below:

TABLE 1: DEFINITION OF INDEPENDENT VARIABLES USED IN HAZARDS ANALYSIS (BFS 89)

Variables	*Definition*
Place of Residence	Place of Residence is entered as a single dummy variable (0 = Rural, 1 = Urban).
Mother's education	Education of respondents is entered as a single dummy variable (women with education below secondary is assigned a value of zero, and those with education secondary and above or higher education is assigned a value of one)
Husband's education	Husbands education is also entered as a single dummy variable (0 = Below Secondary, 1 = Higher)
Age of Mother at Birth of index child	Mother's age at birth of index chi Id is entered as two dummy variables. The reference group is 1 5-24
Parity	Parity is entered as a single dummy variable (women with parity 1-2 is assigned a value of zero and those with parity 3 or more is assigned a value of one). Parity 1-2 indicates the size of an ideal family
Region of Residence	Region of Residence is entered as three dummy variables (0 = Chittagong. 1 = Dhaka, 2 = Khulna and 3 = Rajshahi)
Husband's occupation	Husband's occupation is entered as a single dummy variable (0 = if the husbands are businessmen or service holders, 1 = otherwise)
Current use of Contraception	Current use of contraception is entered as a single dummy variable (0 = No and 1 = Yes)
Health Decision	Health decision is entered as a single dummy variable (0 = if health decision is taken by women alone or jointly with their husbands, 1 = otherwise)
Visit of Health Workers	It is entered as a single dummy variable (0 = if the respondents are never visitedby health workers, 1 = otherwise)

A total of 7,516 ever married women provided information on breastfeeding duration of their last born child which forms our sample. The percentage distribution of these women by the selected socio-economic and demographic characteristics are given in Table 2. Out of the 7,516 women interviewed, 5496 (73.1 per cent) women belong to rural areas while

the remaining 2020 (26.9%) women belong to urban areas. The distribution by region of residence shows that 31.3 percent of the sample of ever married women are in Dhaka, 25.6 percent in Rajshahi, 25 percent in Chittagong and the remaining 18.1 percent in Khulna. Table 2 shows that husbands are found to be better educated than

TABLE 2: PERCENTAGE DISTRIBUTION OF EVER MARRIED WOMEN UNDER 50 YEARS OF AGE BY THE SELECTED VARIABLES (BFS 89)

Variable	*N*	(%)	*Variable*	*N*	(%)
Bangladesh	7516	100	Husband's Occupation		
Place of Residence			Sales / Service	2935	40.2
			Prod. workers	459	6.3
Rural	5496	73.1	Lab. / farmers	1702	23.3
Urban	2020	26.9	Land owners	2200	30.2
Region of Residence			Current Use of Contraception		
Chittagong	1877	25.0	Yes	2509	33.4
Dhaka	2355	31.3	No	5007	66.6
Khulna	1361	18.1			
Rajshahi	1923	23.6	Husband's Education		
			No education	3511	46.9
			Lower Prim.	981	13.1
Mother's Age at Birth			Upper Prim.	574	7.7
of Index Child			Higher	2414	32.3
15-19	1544	20.7			
20-24	2198	29.4			
25-29	1765	23.6	Visit of Health Workers		
30-34	1076	14.4			
35-39	590	7.9	Never	5396	74.6
40-49	297	4.0	Yes	1839	25.4
Parity					
1	1556	20.7	Health Decision		
2	1488	9.8			
3	1117	14.9	Respondent	727	9.7
4	893	11.9	Joint	3236	43.1
5+	2460	32.7	Husband	3551	47.2
Mother's Education					
No educa.	4779	63.6			
Lower Prim.	1019	13.6			
Upper Prim.	672	8.9			
Higher	1045	13.9			

their wives. It is seen that 46.9 percent of women report their husbands as illiterate, while the comparable figure for women is 63.6 percent. There is a big difference between husbands and wives in terms of higher education: 32.3 percent of the respondent's husbands are reported as having received education secondary and above, whereas only 13.9 percent women attain this level of education. Among the other two categories, wive's and husband's educational level are almost equal. The distribution by mother's age at birth of index child shows fewer (20.7 per cent) juveniles under the age of 20 years than those aged 20-24 (29.4 per cent). The percentage of ever married women then decreases to 23.6 in the age group 25-29 and further falls to 14.4, 7.9 and 4.0 respectively in the age groups 30-34, 35-39 and 40-49. The distribution relating to parity indicates that a large percentage (32.7 per cent) of the respondents have large families with 5 or more children ever born while the percentage is also high for those with parity 1 (20.7 per cent). The majority of respondent's husbands are employed in sales and service jobs (40.2 per cent), while a large percentage (30.2 per cent) are land owners. In the other two categories, the percentage is slightly lower (23.3 per cent) for labourers/farmers and only 6.3 percent for production workers. The percentage of women currently using contraception is only 33.4 while it is 66.6 percent for those not currently using any method. The distribution relating to health decision shows that more women (43.1 per cent) discuss with their husbands about family health than those who take decision individually (only 9.7 per cent) reflecting the fact that in a poor traditional socio-economic setup most of the women depend on men to decide about health activities. In 47.2 percent cases, husbands take health decision alone. The distribution by visit of health workers indicates that the vast majority of the respondents (74.6 per cent) report that they are not visited by health workers in their homes, while 25.4 percent report that they are visited at least once.

Review of Breastfeeding Patterns

In the study to identify the determinants of breastfeeding duration in Bangladesh, it is pertinent to have an introduction to the patterns of the same. A brief review of the pattern of breastfeeding duration in Bangladesh based on 1989 BFS data is given below (Mannan and Islam, 1995).

The 1989 BFS data was analysed by using Actuarial Life Table method and it was found that urban women breastfed for a relatively shorter duration of 27.1 months as compared to rural women who breastfed for 28.6 months. Among the four administrative divisions, the average duration of breastfeeding was the lowest in Chittagong division (27.4 months) and highest in Rajshahi division (28.9 months), while it was 28.0 and 28.8 months respectively in Dhaka and Khulna divisions. The BFS data showed that mothers having no-schooling breastfed on the average for 28.8 months, which decreased linearly to 26.2 months for those with higher education. The BFS data showed a decrease in the mean duration of breastfeeding from 28.9 months for women having husbands with no-schooling to 27.2 months for those having husbands with higher education. Mother's age at birth of index child showed that women aged 15-24 breastfed for 28.1

months which increased to 29.3 months for those aged 35-49. The BFS data showed that women with parity 1-2 breastfed on the average for 27.5 months which linearly increased to 28.6 months for those who were reported to have atleast 5 children. The differences in breastfeeding patterns among the occupational status of husbands suggested that the wives of service-holders and businessmen breastfed on the average for 27.5 months, while those of production workers, farmers and land owners breastfed on the average for 28.6, 29.0 and 27.9 months respectively. Women currently using contraception breastfed on the average for slightly longer duration (28.3 months) as compared to those not currently using contraception (28.1 months). Women breastfed for longer duration (28.8 months) when health workers visited them than those who were not visited by health workers at all 28.0 months). Examination of the effect of health decision on the duration of breastfeeding showed that women whose husbands took health decision breastfed on the average for 28.3 months while those who took health decision by themselves or jointly with their husbands breastfed for 28.1 months, but the differential was marginal.

Model Specification for Hazards Analysis

A multivariate analysis of breastfeeding duration is made by proportional hazards regression using ten independent variables as predictors (Table 1). For selection of these variables, a set of 13 variables were initially selected from available information in the BFS data for univariate hazards analysis and the variables which came out significant at the 10 per cent levels were finally selected for the multivariate hazards analysis. The thirteen variables which were used in univariate hazards analysis are:

> (1) mother's age at birth of index child, (2) parity, (3) mother's education, (4) husband's education, (5) husband's occupation, (6) place of residence, (7) region of residence or administrative division, (8) current use of contraception, (9) visit of health workers, (10) health decision, (11) sex of the index child, (12) religion and (13) mother's current work status. A total often variables came out significant at the 10 per cent level in this analysis. The variables sex of the index child, religion and mother's current work status since marriage had insignificant effects on breastfeeding duration and therefore were not included in the multivariate analysis. In the present study, two models are fitted in multivariate hazards analysis. Model 2 is constructed by including all the ten variables. Relative to model 2, model 1 deletes the variable husband's education. The variable mother's current work status since marriage measures only whether a woman is currently working for money. A more appropriate measure would reflect labour force participation in the postpartum period, which is more likely to be linked with breastfeeding continuation. For policy purposes it is important to determine who the women are that work away from home, why they work away, what are the working conditions, what are the policy implications for breastfeeding, child care, and time allocation within the household, and what in turn are the effects on the health and development of infants and children, and in general

TABLE 3: ESTIMATED REGRESSION COEFFICIENTS (b) AND RELATIVE RISKS (expb) OF TERMINATION OF BREASTFEEDING FOR PROPORTIONAL HAZARDS ANALYSIS ON SOME SELECTED CHARACTERISTICS (BFS 89)

	Model I		*Model 2*	
	(b)	exp(b)	(b)	exp(b)
Place of Residence				
(Rural)	—	1.00	—	1.00
Urban	0.108**	1.11	0.099***	1.10
Mother's Education				
(Below Secondary)	—	1.00	—	1.00
Higher	0.162**	1.18	0.157**	1.17
Parity				
(1-2)	_	1.00	_	1.00
3 or more	-0.104**	0.90	-0.102**	0.90
Region of Residence				
(Rajshahi)	—	1.00	—	1.00
Chittagong	0.163*	1.18	0.141*	1.15
Dhaka	0.116**	1.12	0.104**	1.10
Khulna	0.133**	1.14	0.112	1.12
Mother's Age				
(15-24)	—	1.00	—	1.00
25-34	-0.022	0.98	-0.024	0.98
35-49	-0.153**	0.86	-0.139**	0.87
Husband's Education				
(Below Secondary)	_	_	_	1.00
Higher	—	—	0.038	1.03
Husband's Occupation				
(Sales/service)	—	1. 00	—	1.00
Others	-0.067***	0.93	-0.058	0.94
Health Decision				
(Respondent/joint)	—	1.00	—	1.00
Husband	-0.056	0.95	-0.059	0.94
Visit of Health Workers				
(Never)	—	1.00	—	1.00
Yes	-0.006	0.99	-0.003	0.99
Current Use of Contraception				
(No)	—	1.00	—	1.00
Yes	-0.032	0.97	-0.042	0.96

Note: Reference category is in the parenthesis.

: * $p < 0.01$, ** $p < 0.05$, *** $p < 0.10$.

family welfare. Answers to these questions require far more detailed information than is available from the BFS data. Other important factors such as household wealth or income and mother's occupation could not be included in the analysis because the number of cases examined for these variables was very low. Possession of household items could not be included because of the small number of cases of'no possession' category. Supplementation to the infant's diet, irrespective of contraceptive use, may be more important in Bangladesh than in other countries (Huffman *et* a/., 1987). Unfortunately, the variable age at introduction of supplementary food could not be included in the analysis because questions on supplementary foods were completely excluded from the BFS questionnaire.

Results and Discussion

The determinants of breastfeeding duration in the last closed interval was earlier analysed by Jain and Bongaarts (1981) using 1976 WFS data for Bangladesh by multiple classification analysis and their results are presented in this discussion. The studies of breastfeeding determinants based on data of some small localities of Bangladesh are not mentioned here because they do not give nationally representative results. Jain and Bongaarts (1981) found that mother's education had negative independent effect on the duration of breastfeeding. They found that the net effect of parity on breastfeeding was not pronounced. The net effect of mother's current age on the duration of breastfeeding was positive but weak as three years' increase in mother's age added about one month to the duration of breastfeeding. Husband's occupation was found to have strong independent effect on the duration of breastfeeding. Urban residence had negative independent effect on breastfeeding duration.

The results of the present study by hazards analysis show that maternal characteristics such as mother's education, mother's age at birth of index child and parity are more important covariates in explaining breastfeeding duration than the spousal characteristics such as husband's education and husband's occupation which have come out insignificant at the 10 per cent level in the final model (model 2). The education of mother is strongly and positively associated (at 5 per cent levels) with the risk of termination of breastfeeding in both the models. Mothers with higher education have a positive significant effect on the termination of breastfeeding, when compared with women of education below secondary. This means that mother's education has negative significant effect on breastfeeding duration. Parity is found to have a negative and significant effect on the risk of termination of breastfeeding. This indicates that increase in parity is associated with a decrease in the probability of weaning, i.e., women with higher parity are associated with extended durations of breastfeeding. Mother's age at birth of index child has positive significant effect on the duration of breastfeeding. However, only women in the highest age group of 35-49 have a significantly lower hazard of weaning than those aged 15-24. Husband's occupation is found to have a significant effect on the risk of termination of breastfeeding in model 1. However, in the final model (model 2) when husband's education is included,

husband's occupation comes out insignificant. Women whose husbands are employed in professions other than sales or service have a lower hazard of weaning than those whose husbands are either salesmen or service-holders, but the effect is not pronounced. Place of residence is found to have a significant effect on the duration of breastfeeding. Urban women have a significantly higher hazard of weaning than rural women. This indicates that urban women have shorter breastfeeding duration than rural women. There is significant regional variation in the duration of breastfeeding. Relative to Rajshahi division, women of Chittagong, Dhaka and Khulna divisions have higher hazards of termination of breastfeeding, which means that women of these divisions have shorter durations of breastfeeding than those of Rajshahi division. Current use of contraception and visit of health workers are found to have negative insignificant effects on the risk of weaning in both the models. This means that women who are current users and are visited by health personnel are more likely to continue breastfeeding than those who are not current users and are not visited by health workers respectively, but their effects are not prominent. For how long a woman should breastfeed her baby is her and her spouse's decision. To assess this we have examined the effect of family health decision on breastfeeding duration and it is found to be weak and statistically insignificant. However, women whose husbands take health decision are less likely to terminate breastfeeding than those who take health decision by themselves alone or jointly with their husbands.

Summary and Conclusions

The hazards analysis has identified that the maternal characteristics such as mother's education, mother's age at birth of index child and parity are more important in explaining the duration of breastfeeding than the spousal characteristics such as husband's education and husband's occupation, which have come out insignificant in the final model. Mother's education has negative significant effect on the duration of breastfeeding, while mother's age and parity have positive significant effects. However, only women of the highest age group (35-49) have a different breastfeeding pattern than the others. Place of residence and region of residence are also found to have significant effects on breastfeeding duration. Family health decision, visit of health workers and current use of contraception are found to be weak predictors of breastfeeding duration.

Given the well-known important consequences of breastfeeding on postpartum amenorrhoea and birth interval, on the one hand, and infant mortality, on the other, the subject of the determinants of breastfeeding is of potential importance. Breastfeeding is known to give immunological protection to an infant against early morbidity and mortality. In addition, breastfeeding duration is the principal determinant of both the postpartum amenorrhoea and birth interval in Bangladesh and plays the most important role in reducing fertility (Mannan and Islam, 1995; Mannan, 1996). So in view of the infant health and contraceptive benefits of breastfeeding duration in Bangladesh, the findings of the present study are likely to help the Government and policy makers to take appropriate measures

to preserve breastfeeding where it is now common and to encourage and facilitate breastfeeding where the practice is declining. However, the fact that some important variables were not available in the data source must be borne in mind in arriving at the policy implications. The finding that mother's education, mother's age and parity are more important predictors of breastfeeding duration than the spousal characteristics such as husband's education and occupation is very important as mothers are found to be the decision makers about breastfeeding continuation in Bangladesh. This aspect of the study is an important one in policy making decision. The visit by health personnel has only a weak impact on prolonging breastfeeding duration. The reasons may be that the services of the health personnel are not fully utilized in boosting and popularizing the practice of breastfeeding, and that many of them have inadequate knowledge about the nutritional and contraceptive benefits of breastfeeding. So, the services of health personnel in campaigning the benefits of breastfeeding are to be utilized, and intensive training in the benefits of breastfeeding should be imparted to them so that they can motivate mothers to establish and continue the practice of breastfeeding.

In Bangladesh, infant and childhood mortality is still fairly high by international standards (Huq and Cleland, 1990). It has been found that pre-lacteal feeds and the early introduction of supplements are common in Bangladesh (Ahmed *et at.,* 1989; Huffman *et al,* 1987). So the benefits of reduced morbidity, mortality and fertility that could be gained from breastfeeding are probably diminishing due to practices of early feeding of infants. Therefore, infants are very much at risk of early morbidity and mortality, and immunological protection from colostrum is reduced. The length of the infecundable interval is also reduced which in turn may increase the risk of an early subsequent pregnancy (Salway *et al.,* 1993). On the other hand, a large proportion of the population in Bangladesh is still living below the poverty level. Most of these poor mothers do not have adequate knowledge about correct mixing of infant supplements, so the use of bottle-feeding or infant supplements may have serious health effects. In view of these major benefits of full breastfeeding in Bangladesh, women should be encouraged to prolong the duration of full breastfeeding in order to reduce their fertility, infant and childhood morbidity and mortality. A vigorous campaign on promoting full breastfeeding through newspapers, television, radio and other mass media may help to prolong this practice. Since most urban lactating mothers are in close contact with health centres such as hospitals and health clinics, programmes through health personnel, nurses in hospitals, maternity clinics and health care centres could be very effective for urban mothers for this purpose. However, there may be some urban factors like greater availability of food markets, mass media, electricity, media etc. that influence full breastfeeding which could be used to more advantageously search for additional policy recommendations. This requires a much richer information base than is available to us from the BFS data. Finally, it is recommended that the future fertility surveys in Bangladesh should include information on infant supplements particularly timing of liquid and solid supplementation so that their impacts on breastfeeding duration could be analysed for deriving additional policy implications.

Informations on frequency and duration of suckling boots, partial and full breastfeeding should also be included so that their patterns, determinants and effects on fertility and infant and childhood morbidity and mortality could also be examined.

References

Ahmed, S., Archer, S. C. and Bloem, M. W., 1989, Breastfeeding Practises of Mothers in Dhaka and Narayanganj. Unpubl ished manuscript.

Bongaarts, J. and Potter, R. G., 1983, *Fertility, Biology and Behavior*. New York, Academic Press. Cox, D. R., 1972, Regression models and life tables. *Journal of the Royal Statistical Society* (Series B), 34: 187-220. Huffman, S. L., Ford, K., Alien, H. A. and Streble, P., 1987, Nutrition and fertility in Bangladesh: Breastfeeding and postpartum amenorrhoea. *Population Studies,* 41: 447-462.

Huq, M. N. and Cleland, J., 1990, Bangladesh Fertility Survey (Main Report). NIPORT. Dhaka. Jain, A. K. and Bongaarts, J., 1981, Breastfeeding: Patterns, correlates, and fertil ity effects. *Studies in Family Planning,* 12(3): 79-99. Jones, R. E., 1988, A biobehavioural model for breast-feeding effects on return to menses post-partum in Javanese women. *Social Biology,* 35(3-4): 307-323. Mannan, H. R. and Islam, M. N., 1995, Breastfeeding in Bangladesh: Patterns and impact on fertility. *Asia-Pacific Population Journal,* 10(4): 23-38. Mannan, H. R., 1995, Effects of lactation, contraception and other factors on birth interval in Bangladesh, *Genus* (submitted). Menken, J., Trussell, J., Stempel, D. and Babokol, O., 1981, Proportional hazards life table mo dels: An illustrative analysis of socio-demographic influences on marriage dissolution in the United States. *Demography,* 18(2). 181-200. Page, H. J., Lesthaeghe, R. J. and Shah, I. H., 1982, Breastfeeding in Pakistan: An illustrative analysis. World Fertility Survey Scientific Reports, No. 37, pp. 17-21. Palloni,A.andMillman,S., 1986, Effects of inter birth interval and breastfeeding on infant and childhood mortality. *Population Studies,* 40: 215. Pebley, A. R. and Stupp, P. W., 1986, Reproductive patterns and child mortality in Guatemala. *Demography,* 23: 43.Retherford, R. D., Minja, K. C., Thapa, S. and Gubhaju, B. B., 1989, To what extent does breastfeeding explain birth interval effect on early childhood mortality? *Demography,* 26(3): 439. Salway, S., Roy, N. C. and Koenig, M. A., 1993, Levels and trends in postpartum amenorrhoea, breastfeeding and birth intervals in Matlab, Bangladesh 1978-1989. *Asia-Pacific Population Journal,* 8(2). Bangladesh Bureau of Statistics, 1992, *Statistical Pocketbook of Bangladesh.* The Government of Bangladesh. Weis, Peter, 1993, The contraceptive potential of breastfeeding in Bangladesh. *Studies in Family Planning,* 24(2): 100-108.