Demography India
Vol. 23, Nos. 1 & 2 (1994), pp. 83-95

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Trend and Differentials in Breastfeeding and Amenorrhea Durations in a Rural Area in South India

Introduction

THOUGH duration of post-partum amenorrhea (or simply amenorrhea, or laclational infecundability) has been recognized as a 'Proximate Determinant' of fertility (e.g. Bongaarts 1978), in India, estimates of duration of amenorrhea for different populations or areas and for different time periods are rare. Similarly, even though many studies have highlighted the importance of breastfeeding to children (e.g. Population Information Program 1981), time series data on the trend and pattern of duration breastfeeding are very much lacking. In Athoor community development block in Dindigul district of Tamil Nadu State in India, a few sample surveys were conducted since early 1960s. In some of these surveys, information on breastfeeding and amenorrhea particulars were collected and the data analyzed and published to some extent (Krishnamoorthy and Muthiah 1972; Rajaretnam *et al.* no date). As both duration of breastfeeding and amenorrhea are important factors of fertility and of health and survival of children, this paper offers a brief further analysis of the data with respect to trend and differentials in duration of breastfeeding, trend in duration of amenorrhea, and breastfeeding and amenorrhea relationship.

Data and Method

A prospective sample survey of 3000 households, selected on stratified random sampling basis, was initiated in Athoor block in 1965. During the initial visit that started in January 1965, information on fertility and related aspects including breastfeeding and amenorrhea particulars for all pregnancies terminated since January 1964, were collected. The sample households were then revisited once in 6 months until January 1970 and the data updated. The survey data provided breastfeeding and amenorrhea particulars in respect of 2915 pregnancy terminations that occurred during the period from January 1964 to December 1969 (Krishnamoorthy and Muthiah 1972).

Later, in 1986, a retrospective sample survey of over 4000 households, selected on stratified cluster sampling basis, was conducted in the same block. In this survey, all the births that occurred in the sample households during January 1984 to December 1985 were recorded and the mothers of these births were contacted during October to December, 1986 to obtain information on breastfeeding and amenorrhea particulars. Of the 904 live births

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listed to have occurred during the reference period, breastfeeding and amenorrhea particulars were obtained in respect of 762 births (84.3 percent). The mothers of remaining births could not be contacted as they had moved out of the area since childbirth, or not available for contact due to various reasons (Rajaretnam *et al.* no date).

As regards the comparability of the two survey data, in both the surveys, the samples were representative to the whole block, and the definition of breastfeeding and amenorrhea were the same (Krishnamoorthy and Muthiah 1972; Rajaretnam *et al.* no date). The only major difference between the two surveys was that the first survey was prospective while the second was retrospective in nature. In the first survey, as the data on breastfeeding and amenorrhea were obtained through 6 monthly visit to the households, it may be assumed to be fairly accurate. But, some explanation is necessary to justify that the data obtained from the second survey was also fairly accurate. One, the coverage of birth and death events in this survey was expected to be better than most of the previous surveys conducted in the same block (Rajaretnam 1992). Second, the 1986-survey adopted some specific strategies for the estimation of duration of breastfeeding and amenorrhea, as follows. In this survey, though the maximum recall period was about 30 months, the effective maximum recall period was below 18 months as most mothers breastfed their children for over one year (being discussed later). Further, the mothers were asked in the survey to state, as far as possible, the date and month (Tamil or English calender) of discontinuing breastfeeding and resumption of menstruation, if occurred at survey, which most mothers could report reliably (see Rajaretnam 1992, for discussion of a similar strategy adopted for the detection of births and deaths). The duration of breastfeeding and amenorrhea were estimated from the date of birth and date of termination of these events. Hence, these duration estimates can be assumed to be fairly accurate, and comparable to the first survey.

In respect of both the surveys, estimates of mean duration of breastfeeding and amenorrhea and also proportion of mothers continuing the event at specified durations since childbirth were obtained by applying life table techniques.

Trend in Duration of Breastfeeding

Information on mothers initiating breastfeeding is available for the period 1984-86 (Rajaretnam *et al.* no date). The data showed that except a very small proportion of mothers (3.1 percent), all others had initiated breastfeeding. Though the corresponding proportion for the period 1964-69 is not known, it is expected to be not much different. The reason for the small proportion of mothers not initiating breastfeeding was largely due to the fact that in these cases the child had died either immediately after birth or within a few days. It is the customary practice of many mothers to initiate breastfeeding on the third day of birth of the child or even later, and so the death of a child during this period might lead to involuntary non-initiation of breastfeeding. The piece of information available indicates that even now initiation of breastfeeding is universal in the study of population.

Table 1 gives life table estimates of proportion of mothers still breastfeeding at different durations since childbirth and mean duration of breastfeeding for the periods 1964-69 and 1984-86. The data on proportion of mothers breastfeeding at the end of durations 3 months,

12 months and 24 months since childbirth indicates that breastfeeding the child for at least one year appears to be again almost universal. For, during both the periods, the proportion of mothers breastfeeding was over 90 percent at the end of 3 months and over 80 percent at the end of 12 months since childbirth (see also Fig. 1). It is to be noted that Figure 1 is based on all live births and the proportion breastfeeding at one month since childbirth for 1964-69 was assumed to be the same as that for 1984-86. After making allowances for child mortality, the proportion of mothers still breastfeeding increased from 96 to 99 percent at the end of 3 months, and from 90 to 92 percent at the end of 12 months since childbirth, during both the periods. However, at the end of 24 months, the proportion breastfeeding dropped from 55 percent during 1965-69 to 33 percent during 1984-86. This shows that not only a substantial proportion of mothers dropout breastfeeding during the second year of life of the child, but also the proportion terminating breastfeeding in this interval is fast increasing in the recent years.

The relatively faster decline in the proportion of mothers breastfeeding was observed in the duration-intervals 18-24 months and 24-30 months (data are available for 6 months interval only) during the period 1964-69, and in the duration-intervals 12-15 months, 18-21 months and 24-27 months during the period 1984-86. In respect of all these duration-intervals, the proportion still breastfeeding (for an estimated 3 months interval) dropped by 11 to 13

TABLE 1 : LIFE TABLE ESTIMATES OF MEAN DURATION OF BREASTFEEDING AND PROPORTION OF MOTHERS STILL BREASTFEEDING AT THE END OF SPECIFIED DURATIONS SINCE CHILDBIRTH, 1964-1969 AND 1984-86

Months since birth	*1964-69*		*1984-86*		
	Live births	*Exposed children**	*Live births*	*Breastfed children#*	*Surviving children@*
1	—	—	93.70	96.75	99.57
3	90.00	96.00	92.26	95.26	98.85
6	89.00	96.00	89.63	92.55	96.10
9	86.00	94.00	85.35	88.13	91.99
12	84.00	92.00	82.76	85.45	89.44
15	—	—	63.83	65.91	69.26
18	70.00	78.00	59.08	61.00	64.22
21	—	—	31.95	32.99	35.34
24	49.00	55.00	30.12	31.10	33.30
27	—	—	12.13	12.52	13.58
30	23.00	25.00	11.29	11.66	12.65
Mean	22.18	24.29	18.43	19.02	19.91
Cases	2498	2211	762	738	693

- Break-up not available.
* For whom breastfeeding was not interrupted by mortality.
\# Children for whom breastfeeding initialed.
@ Children surviving at survey.

Source : For the period 1964-69, see Krishnamoorthy and Muihiah (1972); and for the period 1984-86, the rates are re-estiinated by the author. For select original estimates, see Rajarctnam *el al.* (no date).

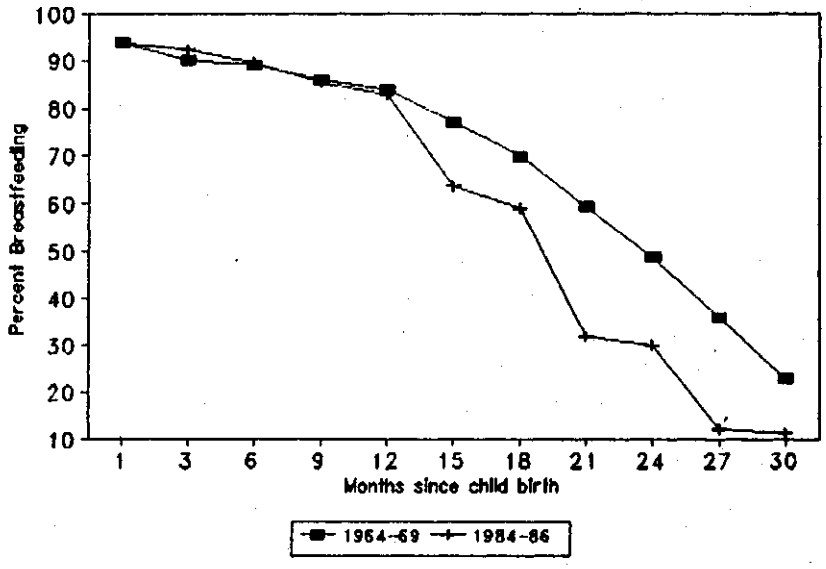

Fig. 1. Proportion Breastfeeding at Specified Durations since Childbirth

percentage points during 1965-69 and by 18 to 27 percentage points during 1984-86. On the other hand, it was just 1 to 3 percentage points in the other 3 months intervals, except in the interval ending 18 months during the period 1965-69, where it was about 7 percentage points. This indicates that during late 1960s, mothers discontinue breastfeeding in large proportions only at around age 2 of the child, but during mid-1980s it was soon after the child had attained age 1. However, even during mid-1980s, those who had not discontinued breastfeeding immediately after age 1 of the child, went on breastfeeding until around age 2 of the child.

The mean duration of breastfeeding for all women who had given birth to a child during the reference period, irrespective of whether they had initiated breastfeeding or not, was 22.2 months for the period 1964-69 and 18.4 months for the period 1984-86. The amount of decline in the mean duration of breastfeeding was 3.8 months, or 17 percent, during the 18 year period. The mean duration of breastfeeding, based on children for whom breastfeeding initiated, worked out to 19.0 months during 1984-86, which is just 0.6 months higher than that based on all live births. The corresponding figure for the period 1965-69 is however not available.

Some skeleton data on mean duration of breastfeeding are available for other areas. A study conducted in a neighbouring block along with the 1986 survey of Athoor block, gave an estimate of mean duration of breastfeeding of 17.6 months, which is very close to that of Athoor block. Similarly, a baseline survey conducted in a community development block

in a neighbouring district namely Pudukottai during early 1980s (exact period not reported) showed a mean duration of breastfeeding of 18.5 months, which is again very close to that of Athoor block (Gandhigram Institute of Rural Health and Family Welfare Trust no date). A study conducted in the states of Uttar Pradesh, Andhra Pradesh, and Kerala showed a mean duration of breastfeeding (based on the second last live birth of the mother) of 19.5 months for Uttar Pradesh and Andhra Pradesh and 18.7 months for Kerala (Mahadevan 1989). A review of studies on breastfeeding in India by Khan (1990), showed that the mean duration of breastfeeding in rural areas of different states in India varied between 16 and 27 months during early 1980s and it was relatively low in urban and better developed rural areas than in the other areas. For the rural area studied in Tamil Nadu (exact area not quoted), it was 16.1 months in 1984 which is slightly lower as compared to that of Athoor block.

The mean duration of breastfeeding after allowing for child mortality (based on children for whom breastfeeding was not interrupted by death of the child for the period 1965-69, and based on children surviving at survey for the period 1984-86) worked out to 24.3 months for the period 1964-69 and 19.9 months for the period 1984-86; a decline of 18 percent, which is almost the same as that based on all live births. It is to be noted that out of the 2498 live births that occurred during 1964-69, only in respect of 2211 births (88.5 percent), the breastfeeding was uninterrupted by child mortality. On the other hand, for the period 1984-86, of the 762 live births for whom breastfeeding particulars were obtained, only 693 (90.9 percent) were surviving at survey.

Differentials in Duration of Breastfeeding

Estimates of proportion of mothers breastfeeding at different durations since childbirth for both the periods 1964-69 and 1984-88 are available only in respect of birth order of the child. Further, for the period 1984-86, estimates are also available by sex of the child, religion and caste, and education and occupation of mother (Table 2). It is to be noted that the figures are based on all live births for the period 1964-69, and based on children for whom breastfeeding initiated and children surviving at survey for the period 1984-86. During both the periods, around 85 percent of the mothers of each birth order group were breastfeeding at the end of 12 months since childbirth. The proportions were only slightly lower for the first order births than for the higher order births. The figures were even higher if only tfle children surviving at survey were considered. However, during both the periods, the proportion still breastfeeding at the end of 24 months since childbirth increased progressively as the birth order of the child increased. Further, in each birth-order group especially in respect of birth-order groups 1,2 and 3, the proportion breastfeeding was lower for the latter period than for the former period, despite the fact that the figures for the latter period exclude children who were not put on breast. For example, for the period 1964-69, the proportion of mothers breastfeeding at the end of 24 months since childbirth was 44 percent, 49 percent and 55 percent for the birth-order groups 1-2,3-4 and 5+, respectively. For the period 1984-86, the proportions for the birth-order groups 1,2,3 and 4-5 were 24 percent, 32 percent, 35 percent and 60 percent, respectively. The analysis indicates that though the duration of breastfeeding is declining, the higher birth-order babies are breastfed for a longer duration than the lower birth-order babies, and this pattern remained the same over period. Further, in each birth-order group, the rate of decline in the proportion was

higher in the durations above 12 months since childbirth than in the durations below 12 months. These indicate that over the past two decades there has been very little change in the breastfeeding durations up to 12 months and there after the earlier cohort (as judged by parity) was distinctively more likely to continue breastfeeding than the most recent cohort is.

With respect to sex differentials in breastfeeding, the data for the period 1984-86 indicate that male children are breastfed for a longer duration than female children, but again the differential treatment seems to have taken place only after the child had attained age one. For, the proportion of surviving children receiving breastmilk at the age of 12 months was 89 percent among both male and female babies, while at the age of 24 months, it was 43 percent among male babies and only 35 percent among female babies.

As far as caste and religion are concerned, non-Hindus (largely Muslims and Christians) had indicated a slightly shorter duration of breastfeeding as compared to Hindus. Among Hindus, mothers of non-scheduled castes were breastfeeding for a shorter duration than mothers of scheduled castes. The differences were evident both in the proportion of mothers breastfeeding at the end of 12 months and at the end of 24 months since childbirth. For, in respect of surviving children, at the end of 12 months since childbirth, only 82 percent of mothers of non-Hindus and 86 percent of mothers of non-scheduled caste Hindus were breastfeeding, while it was about 96 percent among mothers of scheduled castes. At the end of 24 months since childbirth, the proportion of mothers breastfeeding had declined to 18 percent for non-Hindus, 32 percent for non-scheduled caste Hindus but only up to 56 percent for scheduled castes. The analysis indicates that the mothers of non-Hindus and high-caste-Hindus breastfeed their children for shorter duration than the mothers of low-caste-Hindus (scheduled castes).

As far as education of mother is concerned, the data clearly indicate that as the educational level of mother increases, the duration of breastfeeding decreases. The differential breastfeeding is evident in the proportion of mothers breastfeeding both at the end of 12 months and at the end of 24 months since childbirth. However, the differences were wider in the durations above 12 months than in the durations below 12 months. For example, in respect of surviving children, as many as 96 percent of illiterate mothers and around 80 percent of the literate mothers were breastfeeding at age 12 months of the baby, while the proportion breastfeeding at age 24 months of the baby were 52 percent and below 25 percent, respectively.

With respect to occupation of mother, it was observed that mothers engaged in agricultural sector occupations were breastfeeding their children for longer duration than those engaged in non-agricultural sector occupations. On the other hand, non-working mothers were shown to have breastfed their children for shorter duration than working mothers. For, the proportion of mothers still breastfeeding at the end of 24 months since childbirth was 58 percent for those engaged in agricultural sector occupations, 24 percent for those engaged in non-agricultural sector occupations and only 19 percent for non-working mothers.

Unsupplemented Breastfeeding

Unsupplemented breastfeeding (or exclusive breastfeeding) is defined here as feeding the child with mother's breastmilk alone except water or sugar water if at all given

TABLE 2 : PROPORTION OF MOTHERS STILL BREASTFEEDING AT THE END OF SPECIFIED DURATIONS SINCE CHILDBIRTH BY SELECTED CHARACTERISTICS, 1964-69 AND 1984-86

	Breastfed children@			*Surviving children*		
Characteristics	*No. of cases*	*% breastfeeding at the end of*		*No. of cases*	*% breastfeeding at the end of*	
		12 months	*24 months*		*12 months*	*24 months*
1964-69						
Order of birth						
1-2	953	82.0	44.0		Data	
3-4	779	84.0	49.0		not	
5+	763	85.0	55.0		available	
1984-86						
Order of birth						
\	211	76.6	23.7	197	80.0	24.9
2	198	84.7	31.5	187	88.2	33.7
3	137	90.3	34.5	128	95.2	37.2
4-5	132	93.8	60.0	126	97.5	63.2
6+	60	88.1	54.9	55	94.3	60.5
Sex *of the child*						
Male	352	85.6	40.4	333	89.6	43.0
Female	386	85.0	32.7	360	89.0	35.1
Religion/caste						
SC-Hindus	270	91.3	54.1	247	96.1	56.6
Non-SC Hindus	380	82.8	30.5	355	86.4	31.8
Non-Hindus	92	80.8	18.2	91	81.7	18.4
Education of mother						
Illiterate	428	91.8	48.1	401	96.1	51.5
Primary	133	74.2	23.6	120	79.7	26.6
Middle	119	79.1	17.6	116	81.1	18.0
Higher	58	74.6	20.1	56	77.4	20.9
Occupation of mother						
Agri. Sector	338	91.6	53.1	313	96.4	57.6
Non-agri. sect.	323	80.2	22.7	305	84.0	24.2
Housewife	77	78.1	18.9	75	80.3	19.4

@A11 live births for the period 1964-69, and children for whom breastfeeding initiated for the period 1984-86. *Note:* This table is based on data tabulated by 6 and 12 months duration-intervals. *Source:* As in Table 1.

immediately after birth or occasionally. As per this definition, among the 762 mothers for whom data are available for the period 1984-86, only 28 (3.7 percent) were still continuing breastfeeding alone at survey (table not shown). Among others, the proportion reporting

unsupplemented breastfeeding for below 4 months was 32 percent, for 4 to 5 month? was 42 percent, and for 6 months or more was 26 percent. However only in respect of 3 cases, the duration of unsupplemented breastfeeding was reported to be above 12 months. The mean duration of unsupplemented breastfeeding worked out to 5.1 months. In other words, in respect of about three-fourths of the children in the study area, supplementary feeding commenced by age 6 months of the baby even as breastfeeding continued, which is the pattern usually recommended for better health and survival of the children. Though the corresponding figures for the period 1965-69 are not available, the duration of unsupplemented breastfeeding for this period is expected to be much longer than that observed for the period 1984-86. For example, a study conducted in a neighbouring district during early 1980s (exact period not reported) showed that about 87 percent of babies aged below 6 months were receiving breastmilk alone, and only 44 percent of those who aged 7 to 12 months were receiving supplementary food (Gandhigram Institute of Rural Health and Family Welfare Trust no date).

In Athoor block and also in a number of neighbouring blocks, a few supplementary feeding programmes for pre-school children were undertaken since early 1970s and these programmes seem to have motivated mothers towards early initiation of supplementary feeding to their children. For example, in a study conducted during late 1970s (exact period not reported) in 4 neighbouring blocks, majority of the interviewed mothers said that liquid supplements be introduced at the age of 1-3 months of the baby and almost all others said that it should be between 4 to 6 months of age (Rajeswari and Ramanujam 1978). Another study conducted in Athoor block itself around this period showed that nearly three-fourths of the children started receiving liquid supplements by age 6 months and solid supplements by age 8 months (George and Rajeswari 1978). These observations indicate that the supplementary feeding programmes undertaken in Athoor block and in the neighbouring areas had made substantial attitudinal changes among mothers towards early introduction of supplementary feeding, white maintaining a long duration of breastfeeding.

Trend in Duration of Amenorrhea

Table 3 gives life table estimates of mean duration of amenorrhea and proportion of mothers still in amenorrhea at the end of specified durations since childbirth, for the periods 1964-69 and 1984-86. The mean duration of amenorrhea following a live birth was 14.4 months for the period 1964-69 and 9.6 months for the period 1984-86. The decline in the mean duration was 4.8 months, or 33.2 percent during the 18 year period. The proportion of mothers still in amenorrhea at the end of specified durations since childbirth indicates that, unlike breastfeeding pattern that had not changed much until 12 months of age of the child, it was lower for the period 1984-86 than for the period 1964-69, in all the durations, including that of the durations ending 3 months and 6 months since childbirth (see also Fig. 2). It is to be noted that Figure 2 is based on all live births and the proportion still in amenorrhea at the end of one month since childbirth for 1964-69 was assumed to be the same as that for 1984-86. Further, the rate of decline increases as the duration since childbirth increases. For example, the percentage difference in the proportion still in amenorrhea between the periods

TABLE 3 : LIFE TABLE ESTIMATES OF MEAN DURATION OF AMENORRHEA AND PROPORTION OF MOTHERS STILL IN AMENORRHEA AT THE END OF SPECIFIED DURATIONS SINCE CHILDBIRTH, 1964-69 AND 1984-86

Months since birth	*% still in amenorrhea*	
	1964-69	*1984-86*
1		99.74
3	89.00	82.81
6	77.00	64.17
9	67.00	43.91
12	59.00	39.86
15	-	15.42
18	35.00	13.13
21	-	6.34
24	16.00	5.28
27	-	0.75
30	5.00	0.25
Mean duration	14.41	9.62
No. of cases	2550	762

Source : As in Table 1 .

1964-69 and 1984-86 was 7 percent, 17 percent, 32 percent and 67 percent for the durations ending 3 months, 6 months, 12 months and 24 months since childbirth, respectively.

Breastfeeding-Amenorrhea Relationship

A comparison of the extent of decline in the mean duration of breastfeeding and that of amenorrhea indicates that the latter is declining faster than the former (compare Tables 1 and 3). Further, the proportion still in amenorrhea at different durations below 12 months since childbirth was also declining faster even as the breastfeeding pattern had almost remained unchanged in this interval, and child survival prospects improved over time, which also increases the proportion breastfeeding. Note that the infant mortality rate for this block was estimated at 120 for the period 1964-69 (Gunasekaran 1974) and at 82 for the period 1984-85 (Rajaretnam no date). Hence, in this section a further attempt has been made to relate duration of breastfeeding and duration of unsupplemented breastfeeding to duration of amenorrhea. Table 4 gives the proportion of mothers still in amenorrhea at different durations since childbirth and mean duration of amenorrhea, controlling for duration of breastfeeding. It is to be noted that the figures for the period 1964-69 are based on mothers who had completed breastfeeding, and for the period 1984-86 are based on mothers who terminated and mothers who still continuing breastfeeding in the corresponding durations.

The table shows that during 1964-69, the mean duration of amenorrhea following a live birth was just 5.5 months for those who discontinued breastfeeding before 12 months since childbirth, and it increased to 12.0 months for those who continued breastfeeding for 12 to

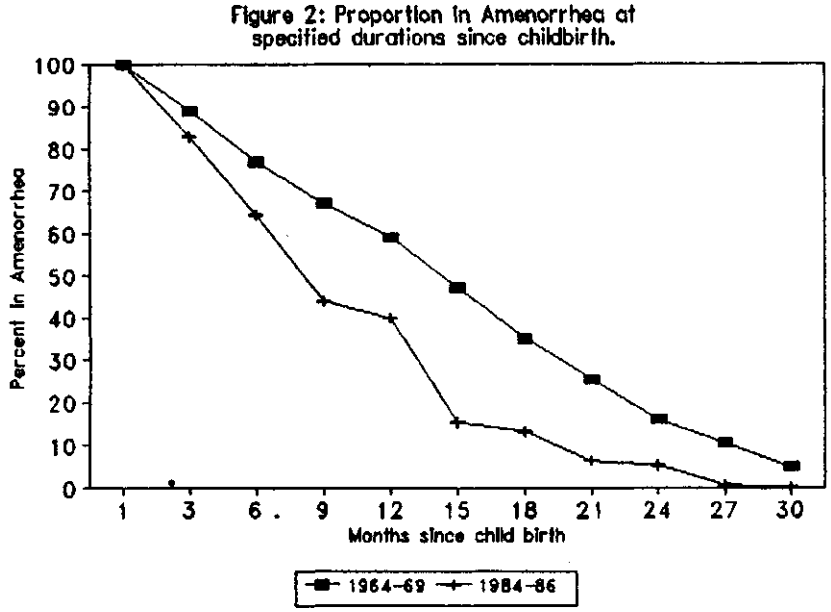

Fig. 2. Proportion in Amenorrhea at Specified Durations since Childbirth.

23 months and to 17.7 months for those who continued breastfeeding still further. This shows that there was marked increase in the length of amenorrhea with the increase in the duration of breastfeeding. For the period 1984-86, however, the relationship between duration of beastfeeding and duration of amenorrhea was in the same direction but not so strong. For example, the mean duration of amenorrhea for those who discontinued and still continuing breastfeeding below 12 months since childbirth was 7.1 months and for those who continued breastfeeding for over 2 years was 11.5 months. That means, even for those who continued brreastfceding for more than 2 years, the mean duration of amenorrhea was only 11.5 months

the period 1984-86, where it was as high as 17.7 months for the period 1965-69.

It is to be noted that the rates for the two periods are not strictly comparable especially for the breastfeeding duration below 12 months, due to the inclusion of mothers still breastfeeding in the calculation of rates for the period 1984-86. However, for this period, an analysis of the mothers who discontinued breastfeeding below 6 months (7.2 percent of 762 cases) showed that the mean duration of amenorrhea was just 4.3 months (table not shown). It is to be noted that there was no mother still continuing breastfeeding in this duration in the sample. Hence, for the period 1984-86, the mean duration of amenorrhea for those who ultimately discontinuing breastfeeding below 12 months since childbirth can be assumed to be around 5.5 months, the mean duration of amenorrhea observed for the period 1964-69 for the corresponding breastfeeding duration. That means, between the periods 1964-69 and

TABEL 4: PROPORTION OF MOTHERS STILL IN AMENORRHEA AT DIFFERENT DURATIONS SINCE CHILDBIRTH AND MEAN DURATION OF AMENORRHEA, BY DURATION OF BREASTFEEDING, FOR THE PERIODS 1964-69 AND 1984-86

Months since birth	*Duration of breastfeeding* (in months)					
	1964-69			*1984-86**		
	< 12m	*12-23m*	*24+m*	*< 12m*	*12-23m*	*24+m*
Percent still in amcnorrhca						
3	59.00	91.00	95.00 88.00	74.37	86.98	80.91
6	35.00	77.00	82.00	48.24	69.32	71.82
9	18.00	65.00		29.79	46.80	57.27
12	10.00	53.00	76.00	23.83	43.05	53.61
18	3.00	21.00	50.00	6.27	13.13	22.18
24	1.00	3.00	25.00	0.00	4.78	11.09
Mean	5.49	12.03	17.69	7.12	10.08	11.46
No. of cases	337	634	688	199	453	110

*Includes mothers still breastfeeding in the durations.
Source: As in Table 1.

1984-86, the mean duration of amenorrhea for those who discontinued breastfeeding with in a year of childbirth has not changed much, whereas that for those who continued breastfeeding for longer durations was much shorter for the period 1984-86 than for the period 1964-69.

One reason for the observed shorter duration of amenorrhea for the period 1984-86 may partly be due to the early initiation of supplementary feeding in this period as compared to the earlier period. For this reason, an analysis of mean duration of amenorrhea and proportion still in amenorrhea at different durations since childbirth, controlling for duration of unsupplemented breastfeeding, has been made for the period 1984-86 (corresponding data for the period 1964-69 are not available) and the results are presented in Table 5. It is to be noted that, as discussed earlier, most mothers initiated supplementary feeding by age 6 months of the child and hence duration of unsupplemented breastfeeding has been considered in three duration grups: 0-3 months, 4-5 months and 6 months and more. The data show that even for those who initiated supplementary feeding within 3 months of age of the child, the mean duration of amenorrhea was 8.5 months and it slowly increased to 9.8 months for those who initiated supplementary feeding during 4 to 5 months of age of the child and 10.5 months for those who initiated supplementary feeding later. That is, these mean amenorrhea durations have varied to a maximum of only two months. Even if the analysis was made with shorter unsupplemented breastfeeding durations, the deviation is expected to be only marginally longer.

The analysis indicates that in the study population, though the relationship between total duration of breastfeeding and duration of amenorrhea is weakening over time, the total duration of breastfeeding is still a better predictor of duration of amenorrhea than the duration of unsupplemented breastfeeding, because in this population initiation of supplementary feeding was early, and the individual variation in the duration of unsupplemented

breastfeeding was narrow. Further, it appears that mothers who initiated supplementary feeding early also had continued breastfeeding for longer durations. It is to be noted that the general health and nutritional level of mothers in the recent period is expected to be better than in the earlier period, and this also might have contributed to the declining trend in the amenorrhea durations, which is not attempted here.

TABLE 5 : PROPORTION OF MOTHERS STILL IN AMENORRHEA AT DIFFERENT DURATIONS SINCE CHILDBIRTH AND MEAN DURATION OF AMENORRHEA, BY DURATION OF UNSUPPLEMENTED BREASTFEEDING, FOR THE PERIOD 1984-86

Months since birth	*Duration of unsupplemented breastfeeding*		
	<4 m	*4-5 m*	*6 + m*
	Percent still in amenorrhea		
3	77.87	87.30	81.82
6	56.17	65.47	70.91
9	34.13	46.75	50.39
12	29.52	42.90	46.59
18	12.23	11.71	16.16
24	4.82	5.86	5.47
Mean	8.51	9.81	10.49
No. of cases	235	307	220

Source: As in Table 1.

Summary and Conclusion

Trend and differentials in duration of breastfeeding and duration of amenorrhea in a rural community in South India has been analyzed. In the study area, initiation of breastfeeding and continuation of breastfeeding up to 12 months of age of the child, are almost universal, provided the child had survived until then. The pattern has not changed much overtime, at least during the last two decades. However, the breastfeeding pattern has changed substantially beyond this interval. The mean duration of breastfeeding has declined from 22.2 months during late 1960s to 18.4 months during mid-1980s. Though breastfeeding up to 12 months of age of the child is almost universal, the 'modern' mothers viz. literate, and those engaged in non-agricultural sector occupations and housewives are often the violators of this norm. In this population supplementary feeding now starts early; in most cases by age 6 months of the baby.

Male children are breastfed for a longer duration than female children. This is an indication of the prevalence of preferential treatment to male children at least as far as nutritional aspects are concerned. However, as the birth order increases, the duration of breastfeeding also increases. This may be attributable to two factors. One, women who give birth to higher birth-order babies are often those belonged to low socioeconomic strata of the society, and they tend to breastfeed their children for longer durations. Two, usually lower order births occur in quick succession than higher order births and hence the chances of voluntary termination of breastfeeding at an early age of the child might be higher for the lower birth-order babies than for the higher birth-order babies.

The mean duration of amenorrhea was 14.4 months during late 1960s and it declined to 9.6 months by mid-1980s. The proportion still in amenorrhea at different intervals has also declined faster during the latter period than during the earlier period. Further, the rate of decline in the amenorrhea duration is faster than that of the breastfeeding duration. During both the periods, even in the durations below 12 months since childbirth, the proportion still in amenorrhea had declined substantially, while the proportion breastfeeding remained almost unchanged in this interval. Further, in the study population though the relationship between total duration of breastfeeding and duration of amenorrhea is weakening overtime, still the total duration of breastfeeding is a better predictor of duration of amenorrhea than the duration of unsupplemented breastfeeding, because in this population both early initiation of supplementary feeding and long duration of breastfeeding are common. However, the faster decline in amenorrhea durations might be due to the combined effect of the increasing general health and nutritional level of mothers, early initiation of supplementary feeding and the larger proportion of mothers discontinuing breastfeeding after 12 months of age of the child in the recent periods, which require further investigation.

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