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Breast-Feeding Patterns in Low-Income Countries

Barry M. Popkin, Richard E. Bilsborrow, John S. Akin

Considerable research has been conducted in developing countries on the potential benefits of breast-feeding, particularly its effects on infant health and postpartum amenorrhea, but information about actual breast-feeding practices is scattered and incomplete. Here we examine the available information, including new data derived from national surveys in 17 low-income countries.

Breast-feeding has important social and economic consequences in low-income countries. It is a dependable means of providing infants with a nutritious and easily absorbed food and with immunological protection against certain diseases. In addition, by prolonging postpartum amenorrhea, it increases the interval between births. Any decline in breast-feeding in low-income countries is therefore a matter for concern (*1–4*).

Summary. Breast-feeding is important to infant nutrition, morbidity, and mortality, and to postpartum amenorrhea (hence to birth intervals). Evidence on breast-feeding patterns in low-income countries from nationally representative World Fertility Surveys and secondary sources shows that in all but a few such countries most children are breast-fed for at least a few months. The limited evidence available on trends seems to indicate a decline in the duration of breast-feeding, but in most of Asia and Africa breast-feeding is almost universal during at least the first 6 months. Earlier weaning is common in Latin America.

Breast-Feeding Patterns

Today there is wide variation in the extent and duration of breast-feeding. Vahlquist (*5*), Knodel (*4*), and Hirschman and Butler (*6*) cite evidence of a rapid decline of breast-feeding in Europe and the United States between the 1930's and the 1960's. Somewhat of a resurgence seems to have begun in those parts of the world in the 1970's (*7*), but modernization is thought to be leading to a tendency towards earlier weaning and discontinuation of breast-feeding in low-income countries (*8–10*), particularly in their urban, periurban, and more modern rural areas. Only scattered statistical evidence has been available, however.

Moreover, it has been extremely difficult to document trends over time even when estimates from more than one time are available. This is because existing studies focus on entirely different populations, use different and sometimes inappropriate definitions of breast-feeding, and are based on nonrepresentative samples, usually from hospitals, clinics, or single communities. For example, a study conducted in a low-income area of Bogotá in 1968 and 1977 was reported to show a 2-month decline in the mean duration of breast-feeding (*11*); however, the 1968 data came from a sample of health center users and the 1977 data from a sample of the general population. A frequently cited study estimated a 20 percent decline in the Philippines between 1958 and 1968 (*8, 12*), but the data came from entirely different and noncomparable populations—the 1958 data from metropolitan Manila, the 1968 data from one area each in Luzon, Mindanao, and the Visayas—and for neither was a probability sample used. These studies and a larger number of small, single-round surveys and participant-observation studies have led to the widespread impression that the basic factors regarding the worldwide trend in breast-feeding are far better established than they really are (*3, 8*).

Some nationally representative surveys provide useful data for longitudinal or trend analyses for four countries in Asia and one in Latin America. In peninsular Malaysia there seems to have been a large decline in breast-feeding between 1950 and 1970–74. On the basis of retrospective life-history data from a nationally representative sample of 1262 women under age 50, Butz and DaVanzo estimated that the proportion of infants breast-fed declined from about 94 to 75 percent (*9*). Using multivariate techniques they found a significant inverse association between a child's year of birth and its probability of being breast-fed (*13, 14*), and a 2.9-month reduction in the mean duration of breast-feeding.

Breast-feeding probably declined also in Thailand between 1969–70 and 1979, according to data from a series of national household surveys which seem approximately comparable over time (*15*). The proportion of children who were never breast-fed was very low and changed little between surveys, but the mean duration declined by about 5 months (from 22.4 to 17.4 months for rural children and from 12.9 to 8.4 for urban). Longitudinal analysis in Korea based on the 1974 Korean National Fertility Survey revealed that from 1950 to 1970 the proportions of children breast-

B. M. Popkin is an associate professor of nutrition, R. E. Bilsborrow a research associate professor of biostatistics, and J. S. Akin is an associate professor of economics, all at the University of North Carolina, Chapel Hill 27514. All are fellows of the Carolina Population Center.

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fed at 9 and 12 months of age remained constant but the proportion breast-fed for at least 18 months declined from 56 to 33 percent (*16*).

Taiwan seems to have had a large, consistent decline in both the proportions ever breast-fed and the mean age at weaning. Using data from nationally representative family planning surveys in 1966, 1973, and 1980, Millman found that among children born in the 12 months preceding the respective surveys the proportion that were ever breast-fed declined from 92.6 to 50.4 percent between 1966 and 1980 and the mean age at weaning declined from 14.7 to 8.8 months (*17*).

A recent report on Mexico is of special interest because of Mexico's high degree of urbanization and modernization. The report compares some statistics on breast-feeding from the 1976 World Fertility Survey (WFS) with those of a 1979 household survey (*18*). The percentages of women who reported breast-feeding the most recently born child declined from 80.3 in 1976 to 77.6 in 1979, a not inconsiderable change in such a brief period. Together with the low levels, it suggests that breast-feeding may have been declining for some time in Mexico. In 1979, even in rural areas 14 percent of the last-born were not breast-fed at all. Of children with the least-educated mothers (no formal education), irrespective of locale, 15 percent were not breast-fed. Moreover, in the 1979 survey only 52 percent of last-born children were reported to have been breast-fed for at least 6 months and only 36 percent for at least 12 months. Nevertheless, the mean duration figures did not change between 1976 and 1979. We need further surveys and analyses to identify the ongoing trends in Mexico, but clearly its breast-feeding rates must be among the lowest of any large, noninsular developing country.

Finally, we can piece together some comparative evidence from large surveys to establish broader patterns, albeit not changes over time. A collaborative study by the World Health Organization (WHO) based on data collected from 1975 through the spring of 1978 in selected urban and rural communities found that only 79 percent of urban Filipino mothers and 87 percent of urban Guatemalan mothers had breast-fed the most recently born child. For the urban and rural mothers combined the percentages were 89 and 93, respectively, in those two countries, and over 90 in Chile, Ethiopia, India, Nigeria, and Zaire (*19*). Although the WHO findings are not based on representative national samples, independent results for the Philippines suggest that they are useful approximations (*20*).

Breast-feeding data are also available from national surveys of nutritional status in five African and three Caribbean countries. They appear to be reasonably representative of major regions in each country. The African studies, conducted by nutritional surveillance units of the University of California at Los Angeles and the U.S. Center for Disease Control, found very high proportions of infants breast-fed during the first year of life (Table 1). Comparisons are difficult to make on the extent and duration of breast-feeding from these studies, but they suggest it is almost universal during the infant's first year of life. Among these five African countries, only in Egypt did a significant proportion of infants receive supplementary food during the first year.

A very different picture emerges in the Caribbean, from surveys by the Caribbean Food and Nutrition Institute (*21*). Weaning in the Caribbean is very early. For example, in Barbados in 1969 about 96 percent of infants were reported to have been breast-fed at birth but only 51 percent at 6 months. In 1971 in Guyana, 82 percent of the urban and 93 percent of the rural infants were breast-fed, but about 66 percent received supplements or formula at 3 months of age. In St. Lucia in 1974, 95 percent of the infants were breast-fed at birth but early weaning commonly followed.

Evidence from WFS Data

The WFS data are the best source now available of comparable, nationally representative statistics on breast-feeding (*22, 23*). By the end of 1980, household surveys had been completed in 40 developing countries. We present results in Table 2 for the 17 countries for which data tapes were available at the time of analysis. The probability of breast-feeding at each age, in months, of the last and next-to-last child born within the 4 years preceding the survey (*24*) is computed by the multiple-decrement life table procedure (*25*). The table reflects information about each child's survival as of the stated month, as well as about breast-feeding; data for children who were born alive but died subsequently are included up to the time of death, but excluded from the denominator subsequently. This procedure enables us to compare breast-feeding patterns across countries independent of differences in infant mortality (*26*). The percentage shown as breast-fed at less than 1 month is the proportion "ever breast-fed."

An alternative to the life table data reported here is "current status" data. A comparison of current status and life table data for Jordan revealed only trivial differences in the levels and patterns of breast-feeding (*27*).

In Table 2 the 17 countries are grouped into three geographic regions: Asia and the Pacific (including Fiji), Latin America, and Africa and the Near East. The designation Latin America is geographic,

Table 1. Breast-feeding patterns in five African countries. Figures in parentheses are sample sizes. [Data from (*33*)]

Description	Breast-fed (%) at age		
	3–5 months	6–11 months	12–23 months
	Cameroons, 1978		
Five or more times a day	99.1	98.5	70.6
	(317)	(597)	(1067)
	Egypt, 1978		
Fully breast-fed		23.8	3.3
At least partly breast-fed		91.8	65.0
		(781)	(1749)
	Liberia, 1976		
Fully breast-fed	93.8*	84.4	49.2†
At least partly breast-fed	96.4*	89.0	63.5†
	(468)	(526)	(945)
	Sierra Leone, 1978		
Five or more times a day	93.8	90.6	65.8
	(347)	(771)	(1177)
	Togo, 1977		
At least partly breast-fed		99.9	87.1
		(692)	(1287)

*0–5 months. †12–24 months.

Table 2. Breast-feeding at various ages of the last two children (or the only child) born to each woman in the 4 years preceding the World Fertility Survey in each of 17 countries. The year shown is the year of the survey. Based on multiple-decrement life-table analysis of data from nationally representative samples of women.

Locale	Percentage breast-fed at age (months)*												Total sample (unweighted)†	Number of women reporting	Number of births omitted‡	Per capita income (dollars)
	<1	1	2	3	4	5	6	9	12	18	24	36				
Asia and the Pacific																
Fiji, 1974§																
Urban	82.3	69.6	61.8	50.9	47.4	45.1	40.0	31.2	21.1	19.2	16.7	14.7				
Rural	89.3	82.3	78.2	72.9	71.7	70.2	67.0	56.1	37.4	32.4	28.8	27.1				
Total	87.0	78.2	72.9	65.9	63.9	62.1	58.4	48.2	32.2	28.1	24.9	23.1	3080	2497	167	1330
Korea, 1974																
Urban	93.8	92.7	92.6	92.2	91.6	90.8	89.5	84.7	53.9	30.9	11.3	2.0				
Rural	96.9	96.3	96.2	95.9	95.8	95.8	95.6	91.4	72.7	54.3	28.3	7.3				
Total	95.1	94.2	94.1	93.7	93.3	92.8	92.0	85.7	61.6	40.5	18.4	4.2	3503	2873	52	980
Indonesia, 1976																
Urban	92.5	89.3	86.7	84.6	82.9	81.5	79.6	71.2	48.3	28.4	15.0	7.5				
Rural	97.3	96.3	95.8	95.0	94.7	94.5	94.1	91.5	81.6	66.2	41.5	25.0				
Total	96.5	95.1	94.3	93.2	92.7	92.3	91.7	88.1	75.9	59.7	37.1	22.0	5480	4652	194	320
Sri Lanka, 1975																
Urban	95.5	92.4	89.9	82.1	79.0	77.0	72.1	63.8	48.4	33.9	18.8	9.6				
Rural	96.0	93.5	92.3	89.0	88.1	87.1	83.8	78.6	62.2	49.2	31.2	18.6				
Total	95.9	93.3	91.9	87.8	86.6	85.4	81.8	76.0	59.8	46.6	29.0	17.0	4334	3587	144	160
Peru, 1978																
Urban	87.9	78.8	73.8	66.8	63.9	62.1	57.5	48.3	27.7	12.8	3.3	0.6				
Rural	94.7	91.6	91.1	89.6	89.3	88.4	86.2	80.8	55.9	32.1	11.4	2.5				
Total	90.6	83.8	80.6	75.7	73.8	72.4	68.7	60.9	38.6	20.2	6.4	1.3	4676	3634	266	720
Guyana, 1975																
Urban	89.0	78.4	70.0	55.0	47.8	43.2	36.4	24.1	12.3	6.6	2.5	0.0				
Rural	88.8	82.8	77.8	68.3	63.7	60.6	53.6	43.4	25.2	16.4	6.9	2.0				
Total	88.9	81.4	75.3	63.9	58.5	54.9	48.0	37.1	21.0	13.2	5.4	1.4	2410	1816	217	520
Africa and the Near East																
Jordan, 1976																
Urban	92.3	85.6	79.6	75.4	70.9	68.6	65.1	57.1	35.0	13.5	3.5	1.1				
Rural	95.5	91.8	90.0	87.2	84.5	82.5	79.1	73.8	52.6	20.5	3.8	0.8				
Total	93.4	87.7	83.1	79.4	75.5	73.3	69.8	62.7	40.7	15.8	3.6	1.0	3412	2586	438	940
Kenya, 1978																
Urban	86.5	84.8	83.0	78.7	75.3	72.4	66.9	54.6	26.4	12.7	4.8	0.0				
Rural	91.8	91.5	90.9	90.0	89.1	87.9	85.6	77.4	46.2	25.7	12.1	6.8				
Total	91.2	90.8	90.0	88.7	87.6	86.2	83.5	74.9	44.1	24.3	11.4	6.4	6342	4791	427	290
Nepal, 1976																
Urban	96.2	96.2	96.2	94.8	94.8	94.8	93.3	89.8	71.2	51.7	28.1	15.6				
Rural	97.3	92.9	92.8	92.2	91.8	91.2	89.8	86.8	73.8	58.4	39.6	24.1				
Total	97.3	93.0	92.9	92.3	91.9	91.3	89.9	86.8	73.8	58.2	39.4	23.9	4224	3474	151	110
Bangladesh, 1976																
Urban	97.8	96.6	95.6	93.9	93.4	92.1	90.1	87.7	77.0	68.0	47.5	27.8				
Rural	99.1	98.5	98.2	98.1	98.0	97.7	97.2	96.8	90.2	81.6	59.7	36.5				
Total	99.0	98.4	98.0	97.7	97.6	97.2	96.6	96.1	89.1	80.5	58.7	35.7	4589	3894	136	80

Latin America															
Costa Rica, 1976															
Urban	71.7	55.2	46.5	33.3	28.1	25.1	18.3	12.3	6.8	4.3	2.3	0.6			
Rural	76.9	64.4	58.0	49.4	46.3	44.0	38.0	26.8	10.8	5.9	2.0	0.6			
Total	74.6	60.3	52.8	42.1	38.1	35.5	29.2	20.3	9.0	5.2	2.2	0.6	1886	1546	85	1390
Panama, 1976															
Urban	71.4	54.8	47.3	36.5	32.4	30.1	22.2	15.3	7.6	4.7	1.1	0.0			
Rural	87.0	81.2	77.0	70.9	68.1	66.5	61.3	52.9	29.7	16.3	3.6	1.2			
Total	79.2	68.0	62.2	53.8	50.3	48.4	41.8	34.1	18.7	10.5	2.4	0.6	2055	1621	108	1200
Mexico, 1976															
Urban	74.4	65.7	59.6	50.9	48.3	45.5	40.3	32.8	17.0	7.7	2.4	0.6			
Rural	89.0	85.8	83.7	80.2	78.2	76.5	73.7	65.9	39.7	19.0	5.0	0.4			
Total	81.1	75.0	70.7	64.4	62.0	59.7	55.5	47.9	27.3	12.8	3.6	0.5	5281	4060	434	1160
Jamaica, 1976															
Urban	94.1	88.0	82.6	68.9	62.4	53.6	43.6	26.1	9.9	6.3	2.2	1.0			
Rural	95.1	92.4	89.3	81.9	75.0	71.7	62.7	40.6	14.1	5.4	1.3	0.9			
Total	94.7	90.5	86.3	76.2	69.5	63.8	54.3	34.2	12.2	5.7	1.7	0.9	1782	1416	102	1060
Dominican Republic, 1975															
Urban	84.5	72.3	65.1	54.8	49.2	45.2	41.7	32.8	18.0	10.0	2.7	1.0			
Rural	94.6	90.8	85.9	80.7	78.1	75.6	71.5	57.8	31.9	13.1	3.2	0.0			
Total	90.3	82.9	76.9	69.5	65.6	62.4	58.6	47.0	25.8	11.8	3.0	0.4	1645	1267	145	840
Colombia, 1976															
Urban	88.2	75.8	65.8	55.8	50.7	46.4	39.5	30.5	15.8	9.8	3.2	0.9			
Rural	92.0	87.9	83.7	78.0	75.2	71.5	66.0	56.1	32.5	14.2	3.7	1.1			
Total	89.9	81.3	73.9	65.9	61.8	57.8	51.5	42.2	23.4	11.7	3.4	1.0	2422	1905	165	760
Lesotho, 1977															
Urban	92.8	90.8	90.1	89.2	88.4	86.8	85.2	81.5	66.8	43.3	10.7	0.0			
Rural	95.5	95.2	94.4	93.5	93.1	92.9	91.9	89.7	75.5	53.6	21.2	6.2			
Total	95.4	94.9	94.1	93.2	92.8	92.5	91.5	89.2	75.0	53.0	20.6	6.0	2601	2198	91	250

*For each age the denominator consists of the total sample (for the locale) minus those children who were younger at the time of the survey and those who did not survive to that age (see text). The sample weights associated with each woman in the WFS samples are taken into account in the calculations. †Total number of the last and next-to-last children live-born to the women in the sample during the 4 years. ‡Births in the 4-year period other than the last and next-to-last. §Based on last-born child only.

not linguistic, and includes predominantly English-speaking Guyana and Jamaica (which have breast-feeding patterns similar to others in the region). The countries are listed in each region in order of descending per capita income—used as a rough indicator of modernization level.

According to these data breast-feeding in the Asia region continued to be very common at the time of the WFS surveys. Except in Fiji (a small island very much exposed to tourism and other outside influences), more than 95 percent of the infants in the countries surveyed were ever breast-fed. In most of the countries the percentages were still 90 to 97 at 6 months. Only in Sri Lanka did breast-feeding taper off more rapidly, and there it was still 88 percent at 3 months and 82 at 6 months. After 6 months the percentages begin to fall faster and also to diverge.

Another way of comparing the data across countries is to determine the median age at weaning. This was well over a year in all the Asian countries except Fiji, where it was less than 9 months; in Korea it was 15 months, in Sri Lanka 17, in Indonesia and Nepal 22, and in Bangladesh 30.

As for urban and rural differences, the usual tendency for breast-feeding to be higher in rural areas prevailed in Asia, except in Nepal between ages 1 and 9 months. Excluding Fiji, more than 95 percent of rural infants were ever breast-fed. At 6 months more than 90 percent were still breast-fed in all Asian countries except Sri Lanka. Urban percentages of ever breast-fed were only slightly lower than rural. Excluding Fiji, percentages breast-fed at 6 months were still high—in the 80 to 93 percent range except for Sri Lanka.

The Latin American picture is dramatically different. Except in Jamaica, significant percentages of infants were never breast-fed—20 percent or more in Costa Rica, Panama, and Mexico (the countries with the most modernization) and around 10 percent in the remaining four countries. By age 6 months less than 60 percent were being breast-fed, except in Peru (69 percent). The median age at weaning was strikingly lower in Latin America than in Asia, being closer to 6 than to 12 months.

Urban-rural differences were also much greater in Latin America than in Asia. In a few countries this was already evident in the percentages breast-fed at birth (differences of over 10 percent in Panama, Mexico, and the Dominican Republic). In rural areas breast-feeding was still the norm up to at least 6 months, whereas at least three in five urban ba-

bies were weaned by 6 months (except in Peru). At 12 months the arithmetic mean percentage of babies being breast-fed in the eight countries was 14 in urban and 35 in rural areas.

Data from only three countries in the Africa–Near East region were available for analysis because WFS fieldwork had only recently begun or been completed there. In these limited data regional breast-feeding patterns appear to be intermediate between those of Asia and Latin America. Except in Kenya, urban-rural differences were smaller than in the other two regions. Median age at weaning was 11 months in Jordan, 12 in Kenya, and 18 in Lesotho.

Summary and Implications

The most important general finding is the very large difference in breast-feeding patterns between the two major regions studied. Breast-feeding during the first year of life seems to be the norm in most Asian countries (*28*) but not in most Latin American countries (*29*). The overall (arithmetic) mean percentage breast-fed at 6 months was 85 in Asia and 51 in Latin America; at 12 months the difference was even more striking: 66 and 22. In rural areas mean percentages breast-fed in the two regions were 88 and 64 at 6 months, and 70 and 35 at 12; in urban areas they were 77 and 37 at 6 months and 53 and 15 at 12. It is noteworthy that breast-feeding is more prolonged in urban Asia than in rural Latin America. Weaning may be said generally to occur only well after a year in rural Asia, at around a year in urban Asia, between 6 and 12 months in rural Latin America, and during the first few months of life in urban Latin America. Breast-feeding in Africa and the Near East may fall somewhere between the Latin American and Asian norms.

For some countries (for instance Colombia, Kenya, and Jordan), the WFS data indicate that breast-feeding may be at levels low enough to cause concern related to child health and mortality and to birth spacing. As more data become available from the WFS and future surveys, patterns will become clearer. Clear information about Africa is especially needed because of the greater lack of safe alternatives to breast-feeding (water is generally less likely to be potable, formula is too expensive, and so on). Possibly added evidence will indicate continuing high levels of breast-feeding, as suggested by earlier studies based on samples of limited regions (Table 1), rather than the much lower levels suggested by the WFS data for Kenya and Jordan (*30*).

A stronger statement about the negative consequences of reduced breast-feeding can be made about rural Latin America. Even though overall income levels are generally much higher in this region, income distribution is so unequal—especially as between urban and rural areas—that the fairly early ages of weaning in rural Latin America almost certainly contribute to demographic and health problems. These problems are likely to be much more serious than the consequences of the very low levels of breast-feeding in urban Latin America, given the urban availability of potable drinking water and the much higher levels of income and education (hence capacity and ability to administer alternative foods satisfactorily) (*31*).

In Asia, on the other hand, breast-feeding continues to be prolonged in most countries, so the policy issues may be very different and related more to questions such as how to maintain breast-feeding customs as modernization proceeds.

As a final and important caveat, we note that we have rarely presented (or found) data to measure feeding trends, yet we have slipped into the prevailing habit of assuming that wherever breast-feeding is not virtually universal and prolonged it must have declined. Since outside influences and the forces of modernization have increasingly affected most low-income countries in the last three decades, we share the belief that the declines that have occurred have generally been during this period. But it is beyond our scope here to identify either when they occurred or what forces are responsible for them (*32*). Even measuring and identifying these trends in more than a handful of countries must await subsequent household surveys.

Finally, we must avoid allowing the focus on breast-feeding to lead to neglect of other aspects of infant feeding. Lack of attention to the other components of infant and child nutrition may result in improper specification of policy issues and misallocation of resources. This is particularly evident in Africa and much of Asia and rural Latin America, where infant and child morbidity and mortality remain high in areas where breast-feeding is high. These are still the areas where the majority of the world's poor live.

The widespread concern about breast-feeding is useful perhaps to alert us to the desirability of minimizing its further decline or ameliorating the effects of a decline. For those purposes we need greater knowledge of the determinants of breast-feeding patterns and trends. Factors potentially amenable to policy manipulation include not only the activities of infant-formula companies but, for example, training of health workers and hospital personnel, health education courses in schools, the use of the mass media, and the conditions of women's participation in the labor force.

References and Notes

1. The degree of concern will depend on other environmental and socioeconomic conditions affecting the infant's exposure to pathogens and the adequacy of other foods it receives. For a review of the health, emotional-developmental, and demographic consequences of breast-feeding see (*2–4*).
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tativeness of the populations sampled in these nine WHO surveys. Researchers in each country were asked to select "reasonably typical" population groups representing urban economically advantaged, urban poor, and rural families. In addition, questions relating to breast-feeding practices were poorly worded; for example, ever-breast-fed data are based on the question "Was the baby given the breast immediately after birth?"

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21. *The National Food and Nutrition Survey of Barbados* (Scientific Publication No. 237, Pan American Health Organization, Washington, D.C., 1972); *The National Food and Nutrition Survey of Guyana* (Scientific Publication No. 323, Pan American Health Organization, Washington, D.C., 1976); *The National Food and Nutrition Survey of St. Lucia* (Caribbean Food and Nutrition Institute, Kingston, Jamaica, 1976).
22. See, for example, *The World Fertility Survey: January 1978–December 1980 Annual Report* (International Statistical Institute, The Hague, 1981). Several studies make use of WFS data on breast-feeding. See L. Williams, *Intercom* **7**, 7 (1979); A. K. Jain and J. Bongaarts (*23*); B. Ferry, *World Fertility Survey Comparative Studies—Cross-National Summaries*, No. 13 (International Statistical Institute, The Hague, 1981).
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24. The analysis by Jain and Bongaarts (*23*) is based on separate analysis of open and closed birth intervals. The desirability of using information derived from both open and closed intervals together in analyses of the determinants of the duration of either birth intervals or breast-feeding has recently been made clear by H. J. Page, B. Ferry, I. H. Shaw, R. Lesthaeghe, in "The most recent births: analytical potential and some underlying problems," presented at the Seminar on the Analysis of Maternity Histories, International Union for the Scientific Study of Population, London, April 1980.
25. In the WFS surveys the mother was asked whether the last and the next-to-the-last child were ever breast-fed and, if so, for how many months. The "ever-never" results are expected to be accurate, but digit preference and memory lapses are expected to affect the quality of the duration data (*14*).
26. Breast-feeding information about the other children born to these mothers during the 4-year interval was not obtained in the WFS surveys; hence, data for about 1 to 10 percent of children born in that period are omitted (Table 2). Inasmuch as the excluded children were born to women of especially high fertility, they would generally have been breast-fed for relatively short periods. The result is a very slight upward bias in the life table probabilities we report. Since this proportion of births missed will vary directly with the national fertility level, the differences among countries in the probabilities reported in Table 2 are exaggerated slightly.
27. J. S. Akin *et al.*, "Breast-feeding patterns and determinants in Jordan," presented at the International Union for the Scientific Study of Population, Manila, December 1981.
28. We are aware that studies we have reviewed here (*9, 15, 17*) report breast-feeding declines in Malaysia, Thailand, and Taiwan. Yet overall, Thai breast-feeding levels continued to follow the Asian pattern, and our inclusion of Fiji in the means gives weight to smaller Asian countries where there is less breast-feeding. The absence of data for India and China is notable, but the WHO data show breast-feeding in India continues at a high level.
29. In Latin America our figures may be somewhat biased downward because six of the eight countries are from the Central America–Caribbean area (which is perhaps more influenced by U.S. tourism and commerce) and only two are from South America. On the other hand, our data exclude three modern southern South American countries. Brazil is the main missing observation.
30. However, at least in urban areas there is some recent evidence of declines in breast-feeding in Africa; see H. J. Page and R. Lesthaeghe, Eds., *Child-spacing in Tropical Africa: Traditions and Change* (Academic Press, New York, 1981).
31. Of course, there are problems with water quality in smaller urban areas, and some cities as well, and many marginal populations in urban areas have neither adequate access to facilities nor sufficient knowledge about nutrition for alternatives to breast-feeding to be acceptable.
32. In a separate paper we discuss the factors that determine breast-feeding patterns (B. M. Popkin, R. E. Bilsborrow, J. S. Akin, M. E. Yamamoto, "Breast-feeding practices in low-income countries," unpublished).
33. *National Nutrition Surveys:* Liberia, 1976; Sierra Leone, 1978; United Republic of Cameroons, 1978; *Nutrition Status Surveys:* Arab Republic of Egypt, 1978; Togo, 1977 (Office of Nutrition, Agency for International Development, Washington, D.C.).
34. *World Bank Atlas* (International Bank for Reconstruction and Development, Washington, D.C., 1979).
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