Reversal of the Decline in Breastfeeding in Peninsular Malaysia? Ethnic and Educational Differentials and Data Quality Issues

Julie DaVanzo, Jeff Sine, Christine Peterson, and John Haaga

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REVERSAL OF THE DECLINE IN BREASTFEEDING IN PENINSULAR MALAYSIA?--ETHNIC AND EDUCATIONAL DIFFERENTIALS AND DATA QUALITY ISSUES

(Short title: Breastfeeding Trend Reversal in Malaysia)

Julie DaVanzo, Ph.D., RAND, Santa Monica, CA
Jeffrey Sine, M.P.H., RAND, Santa Monica, CA
Christine Peterson, M.A., RAND, Santa Monica, CA
John Haaga, Ph.D., International Centre for Diarrhoeal Disease Research, Dhaka, Bangladesh

Address correspondence to:
Julie DaVanzo
RAND
1700 Main Street, P.O. Box 2138
Santa Monica, CA 90407
(310) 393-0411 x7516
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ABSTRACT

Data from the First and Second Malaysian Family Life Surveys, fielded in 1976 and 1988 respectively, are analyzed to examine long-term trends in breastfeeding in Peninsular Malaysia, educational and ethnic differences therein, and the quality of retrospective data on infant feeding.

There was a steady decrease between the mid-1950s and mid-1970s in the percentage of babies who were ever breastfed, but there has been a nearly monotonic increase since 1975. Part of the observed change in overall breastfeeding rates is attributable to the changing composition of the Malaysian population. Over time, the percentages of births to population subgroups with higher rates of breastfeeding -- particularly Malays and more highly educated women -- have increased. However, there is also evidence of changes in women's rates of breastfeeding within these subgroups.

Many Malaysian infants have a duration of total breastfeeding (including with supplementation) that is considerably shorter than WHO's recommended duration of exclusive (unsupplemented) breastfeeding (4 months). Moreover, nearly all Malaysian infants who are breastfed are first given supplementary food or beverage shortly after birth. Breastfeeding promotion efforts in Malaysia need to give more emphasis to the appropriate timing and types of supplementary feeding.

Key words: Breastfeeding; infant feeding; Malaysia; education; ethnicity; data quality.
REVERSAL OF THE DECLINE IN BREASTFEEDING IN PENINSULAR MALAYSIA?--ETHNIC AND EDUCATIONAL DIFFERENTIALS AND DATA QUALITY ISSUES

Breastfeeding has been advocated as the optimal form of nutrition for infants. In developing countries, the benefits of breastfeeding have been shown to be life-saving (Habicht, DaVanzo, and Butz, 1986; Martorell and Ho, 1984; Martorell, Mason, Rasmussen, and Habicht, 1984), especially in areas where water and sanitation are poor (Habicht, DaVanzo, and Butz, 1988). Furthermore, in some parts of the world, breastfeeding is still the major means of birthspacing, especially among the poorest women (Short, 1987; World Bank, 1984). The World Health Organization (WHO) and the American Academy of Pediatrics currently recommend that infants be fully breastfed (without any supplementation) for four to six months (WHO, 1989; American Academy of Pediatrics, 1980).

In the 1970s and early 1980s there was a widespread perception that breastfeeding incidence and duration were decreasing in many developing countries, causing considerable concern about the possible health consequences (Berg, 1973; WHO, 1982), and leading to efforts by WHO and UNICEF, among others, to promote breastfeeding (Grant, 1988). However, comparative analyses have found very wide variation in both the proportion of infants ever breastfed and typical durations of breastfeeding, with no evidence of a universal decline (Popkin, Bilsborrow, and Akin, 1982; Thapa and Williamson, 1991; Trussell, Grummer-Stawn, Rodriguez, and VanLandingham, 1992; Popkin, Akin, Wong, and Flieger, 1989). In several countries and regions in which breastfeeding declines had been recorded, more recent reports have shown an end and even reversal to that trend (Joesoef, Annest, and Utomo, 1989; Millman, 1986). Documentation of trends in breastfeeding in developing countries, however, has
been limited by the lack of comparable data for several points in time. The First Malaysian Family Life Survey (MFLS-1), fielded in Peninsular Malaysia in 1976-77, was one of the few datasets to include a complete retrospective history of women's breastfeeding experiences, permitting a documentation of the long-term trends in breastfeeding initiation and duration. Those data revealed a general decline in the proportion of infants breastfeeding from 92 percent in 1953 to under 78 percent in 1977 (Haaga, 1986). However, the data also suggested a reversal of the long-term trend in the 1970s, with breastfeeding rates being significantly higher in 1975-77 (79 percent) than in 1970-74 (75 percent) (Haaga, 1986). Haaga investigated whether this apparent reversal could be due to biases, such as Hawthorne effects, selection bias, or recall error, and concluded that those were not likely.

The purpose of this paper is to use new data, from the Second Malaysian Family Life Survey (MFLS-2), fielded in 1988-89, to examine whether the breastfeeding upturn that was detected in the mid-1970s continued, or whether it was simply a temporary fluctuation around the long-term trend. We also examine the trend in the duration of breastfeeding. Like MFLS-1, the MFLS-2 data contain complete retrospective histories on the initiation and duration of breastfeeding for several thousand women, enabling us to update breastfeeding trends for Peninsular Malaysia through the late 1980s. The retrospective life history was administered both to a new group of women of reproductive age (the “New” sample) and to the same women who were the respondents to MFLS-1 in 1976-77 (the “Panel” sample). Since both the MFLS-1 and MFLS-2 surveys asked virtually the same questions about breastfeeding, data from the Panel sample provide the unique opportunity to assess the quality of long-term recall.
MATERIALS AND METHODS

DATA

Data for this study are from the MFLS-1, fielded in 1976-77, and from two samples (the "New" and the "Panel" samples) of the MFLS-2, fielded in 1988-89. The samples for each survey consist of randomly selected private households in Peninsular Malaysia. In the MFLS-1, households that contained at least one ever-married woman 50 years old or younger were included in the sample frame. A total of 1,262 households (88 percent of the eligible probability sample) completed Round 1 of the survey. These households are contained in 52 primary sampling areas in Peninsular Malaysia, of which 49 were randomly selected; the other three were purposely selected to give additional representation to Indian households and households in fishing communities. Our analysis of MFLS-1 data in this paper excludes women living in the three purposively selected areas and weights to adjust for the number of ever-married women in each household.

The MFLS-2 collected data on the breastfeeding (among many other topics) of all births to women covered by MFLS-1 (the "Panel" sample) and a "New" sample of women of reproductive age (ages 18-49 plus ever-married women under 18). There are 889 respondents in the Panel sample (a follow-up rate, after 12 years, of 71 percent of the women interviewed in MFLS-1) and 2,184 respondents in the New sample (just over 90 percent of those presumed eligible) (Haaga, DaVanzo, Peterson, Tey, and Tan, 1993). The analyses of the New sample presented here are weighted to adjust for the oversampling of Indians (who comprise only ten percent of the Peninsular Malaysian population) and for the fact that if there was more than one eligible woman in a household, only one was selected at random to be the main respondent.
In both MFLS-1 and MFLS-2, a Female Life History questionnaire was administered to each selected woman. This instrument collected complete pregnancy histories, including information on the initiation of breastfeeding and durations of unsupplemented and supplemented breastfeeding of all of the woman’s births. Virtually the same questions about breastfeeding were asked in both surveys.

MEASURES

We consider both the initiation of breastfeeding (percentage of babies who ever breastfed) and the percentage who breastfed at least four months. As noted above, WHO and the American Academy of Pediatrics currently recommend that infants be fully breastfed (without any supplementation) for four months. Clearly a child who is completely weaned before four months is not conforming to these recommendations. In Malaysia, babies are typically given some food or liquid other than breast milk very soon after birth. In these data, the durations of unsupplemented breastfeeding (defined as breastfeeding with no regular [daily] supplementation of any food or liquid, including water2) are extremely short; the median durations of unsupplemented breastfeeding that are reported in the MFLS-2 New sample are one day for every ethnic and educational subgroup for all years considered. Breastfeeding rates (percentage of babies who initiated breastfeeding or who breastfed at least four months) are reported as three-year moving averages to smooth some of the year-to-year variation in the data.

The questions asked about duration of breastfeeding were identical in MFLS-1 and MFLS-2 (“How long did you breastfeed (NAME OF CHILD)?”). However, the explanations of the question that asked whether the child ever breastfeed (which immediately preceded the question about duration of breastfeeding) differed slightly between the two surveys. In both surveys, women were asked “Did you breastfeed (NAME OF CHILD)?” However, in MFLS-1 this was followed with “I want to know
even if it was for a few days,” while in MFLS-2, in an effort to pick up more unsuccessful attempts at breastfeeding, the qualification was changed to “I want to know even if you just tried once or twice.” Hence, women who breastfed for only a day or two might report that they didn’t breastfeed in response to the MFLS-1 wording but that they did in response to the MFLS-2 wording.

SAMPLES

The samples used here contain information on 4,824 births reported in MFLS-1 for the 1953-1977 period and on 5,907 births reported in MFLS-2 New sample for the 1961-88 period. (Only those births recorded in the MFLS-2 sample which occurred after 1964 are used in analyses comparing MFLS-1 and MFLS-2 data; ethnic and educational subgroup analyses use only MFLS-2 data and utilize all births in that sample from 1961 to 1988.) The ever-married portion of the New sample is comparable to the MFLS-1 sample, which consisted of ever-married women under the age of 50 in 1976.

Because the MFLS-1 sample and the MFLS-2 New sample are cohorts of women under the age of 50 (in 1976 and 1988, respectively), as one uses the data to refer to earlier years they do not represent the full age range of Malaysian women of reproductive age. For example, in 1970, the oldest woman in the MFLS-1 sample was 43 and the oldest woman in the MFLS-2 New sample was 31. (This will cause relatively little problem for the ten years before the interview dates because the rate of childbearing is relatively low above age 40.) However, there is relatively little variation in breastfeeding with mother's age in these data. We adjust for changes over time in the age composition of the sample primarily by limiting our analysis of trends for the entire population to the 24 years preceding each survey. We have also compared MFLS-1 and MFLS-2 data on women from the same birth cohort for the time period covered by both of the surveys and
found that this does not affect any of the results reported here.

Analyses of ethnic and educational differentials use only data from the MFLS-2 New sample, and include all births back to 1961. All subgroups cover the same age range in a given year; hence, comparisons of rates among subgroups are valid, with the caveat that in the earlier years they only refer to the younger segment of the population of married women of reproductive age. (However, as noted above, differences in breastfeeding among mothers of different ages are not especially pronounced in these data, especially relative to the ethnic and educational differences.)

To assess the reliability of women's reports about breastfeeding, responses reported by Panel sample women in 1988 (i.e., in MFLS-2) about 4,094 pre-1977 births are compared to responses in 1976 (i.e., in MFLS-1) by these same women about these same births. We compute the Kappa coefficient, a widely used statistic measuring retest reliability (Cohen, 1960).³

Results are presented graphically. In all figures, points are not graphed if the sample sizes are less than 25. (Most sample sizes exceed this lower limit considerably. For example, the average number of births on which the points in Figure 1 are based exceeds 700.) All statements about statistical significance are based on a level of p < 0.05 or better.

RESULTS

OVERALL TIME TRENDS

Figure 1 shows the long-term trends in the percentage of Malaysian infants who ever breastfed, as reported in MFLS-1 and in the MFLS-2 New sample. Both data sets show a steady decrease in the breastfeeding rate until the mid-1970s, after which the rate increased. The last two points for the MFLS-1 curve show the same upturn that Haaga (1986) reported. The MFLS-2 curve shows that this increase indeed continued over the
following decade. The MFLS-2 breastfeeding rates for the later 1980s are significantly higher than the MFLS-2 rates for the mid-1970s.

In Figure 2, we consider the percentage of infants who breastfed for at least four months. Both data sets show decreases in this indicator through at least 1976. The MFLS-2 data show that this percentage increased in the 1980s. The rate for 1987-89 is significantly higher than for 1975-77. However, in the most recent years considered just over one half of all babies were breastfed for at least four months. That is, nearly half of all babies had a duration of any breastfeeding that is less than WHO’s recommended four months duration of exclusive breastfeeding.

Although MFLS-1 and MFLS-2 generally show similar trends for the years covered by both surveys, the rates from MFLS-1 are generally lower than those from MFLS-2 for both initiation of any breastfeeding and for at least four months duration of breastfeeding. For breastfeeding initiation the difference between the MFLS-1 and MFLS-2 rates may be due to the fact, noted above, that MFLS-1 qualified its question with “even if it was for a few days,” whereas MFLS-2 instead said “even if you just tried once or twice.” Another possible reason for the differences in both the initiation and at-least-four-months measures is reporting bias. Breastfeeding was more popular and given more attention in 1988 than in 1976 (Kandiah, 1992), and women may have been more likely to report that they breastfed in the later survey. Sudman and Bradburn (1974) note the tendency of respondents in face-to-face interviews to over-report socially desirable behaviors and to under-report socially undesirable behaviors. The unique data that we have for the Panel (re-interviewed) sample, where we asked the same women 12 years later about the same births, enables us to look at these possibilities.

In the vast majority (93 percent) of the cases, women reported the same answers in both surveys regarding whether or not they breastfed a particular child. The Kappa coefficient has a value of 0.70, which is considered to be an “excellent” degree of
agreement (Fleiss, 1981). However, Panel respondents in 1988 reported a higher average breastfeeding rate for their pre-1977 births (87.2 percent) than they had reported in 1976 for those same births (84.3 percent), a difference that is statistically significant (using a matched pair test). That is, the seven percent of women who reported different answers in 1976 and 1988 were more likely to have changed their answers from "did not breastfeed" to "did breastfeed" than the reverse. Of the cases who reported in MFLS-1 that they did not breastfeed but in MFLS-2 that they did, the majority reported a fairly short duration of breastfeeding in MFLS-2 (though many of these are longer than the "few days" mentioned in MFLS-1): 13 percent reported a duration of 3 days or less in MFLS-2, 25 percent reported a duration of a week or less, 50 percent reported a month or less, and 75 percent reported four months or less.

For the measure of whether the child was breastfed for at least four months, women’s responses are consistent between the two surveys for 85 percent of all infants. The Kappa coefficient in this case is 0.68, which is also considered to be an "excellent" degree of agreement. Again a higher percentage for pre-1977 births is reported in MFLS-2 (63.2%) than in MFLS-1 (61.8%), and this difference, though smaller than for breastfeeding initiation, is statistically significant. This suggests that, although some of the difference between MFLS-1 and MFLS-2 in breastfeeding initiation rates may be due to differences between the two surveys in the way initiation was defined, for both initiation and the at-least-four-months measure the difference may also be due to the fact that breastfeeding was more socially acceptable in 1988 than in 1976.

Overall, the trends in breastfeeding from these two reports about the same breastfeeding events are remarkably similar, despite some disagreement between MFLS-1 and MFLS-2 concerning the proportions breastfed at all and the proportions breastfed at least four months. Furthermore, the extent of disagreement is generally small relative to the ethnic and educational differentials discussed below. We now disaggregate the data
by mothers’ ethnicity and their educational attainment, to discern whether the breastfeeding upturns we see in Figures 1 and 2 also characterize subgroups of the Malaysian population. The remaining graphs present data from the MFLS-2 New sample for births during the period 1961-1988.

ETHNIC DIFFERENCES IN BREASTFEEDING

Figure 3 shows trends in the percentage of infants who initiated breastfeeding for the three main ethnic groups in Peninsular Malaysia -- Malays, Chinese, and Indians, who comprised about 58, 30, and 10 percent of the population, respectively, in 1988. Malays maintained high rates of any breastfeeding over the entire period examined, with rates exceeding 95 percent in every year. In contrast, breastfeeding initiation rates for Chinese and Indians declined substantially until the mid-1970s, after which the sustained decline ceased. Breastfeeding of infants born to Chinese women fell from well over 70 percent in the early 1960s to only 46 percent in the mid-1970s. Thereafter, the rate fluctuated between 48 and 54 percent. Among Indian mothers, the rate of breastfeeding declined from an average around 90 percent in the mid-1960s to about 75 percent in 1974. Since then, the breastfeeding rate among Indian women has fluctuated between 72 and 82 percent and generally increased in the 1980s.

The patterns are similar for the percentage of babies who breastfed for at least four months. There was little if any decline among Malays; over the period considered, around 70 percent of Malay infants breastfed for at least four months. Among Chinese and Indians, rates declined; moreover these declines were nearly in parallel since about 1970. For this measure, the Indian rate is closer to the Chinese rate than to the Malay rate. (For the first measure [ever breastfeeding] the Indian trend line was almost equidistant between the Malay and Chinese lines.) By 1986-88, only 18 percent of Indian infants and a remarkably low 8 percent of Chinese breastfed for at least four months. The
Indian and Chinese percentages in the 1980s are significantly lower than those in the 1960s.

Some researchers have noted that cultural and religious differences may account for these ethnic differences in breastfeeding, which remain large even when other socioeconomic variables associated with ethnicity are controlled (Haaga, 1984). For example, all Malays are Muslims, and “Islam commands mothers to breastfeed” (Chung, Viegas, and Ratnam, 1991, p. 131). In explaining the low breastfeeding rate for Chinese, Chung et al. note: “Chinese have traditionally considered it degrading to have to breastfeed personally their babies. Only the poorest mothers in China used to breast-feed their own babies; well-to-do mothers almost invariably employed a wet nurse to do it. Ethnic Chinese throughout South-east Asia are poor breast-feeders” (p. 131). It is interesting that differential use of oral contraception (which may interfere with lactation) does not seem to be the reason for ethnic differences in breastfeeding, since both Malays and Chinese have a high rate of use of oral contraceptives (DaVanzo, Tan, and Ramli, 1989).

Within ethnic groups we do not see in Figure 3 the same extent of upturn in the percentage of infants who ever breastfed as we saw in Figure 1 for the entire sample, and in Figure 4 we see no evidence of the increase in the percentage of infants who breastfed for at least four months that we saw modestly in Figure 2. This can be explained by changes in the ethnic composition of births in Malaysia. Because fertility rates have declined more for Chinese and Indians than for Malays (Hirschman, 1986), the proportion of all births that are to Malays has increased, from about 45 percent in the mid-1960s to around 65 percent in the mid-1980s. As a result, Malays’ breastfeeding rates exerted an increasing effect on the overall breastfeeding rate. At the same time, declining trends in Chinese and Indian breastfeeding rates were attenuating.

EDUCATIONAL DIFFERENCES IN BREASTFEEDING
Figure 5 shows markedly different trends in breastfeeding initiation for women of different educational attainment levels. Among women who had no formal education or attended only primary school, the proportion ever breastfeeding their infants fell from above 90 percent in the early 1960s to just below 80 percent in 1977, and has increased somewhat since then, stabilizing at around 85 percent in recent years. By contrast, rates of breastfeeding among women with some secondary education increased substantially over the entire period, from under 60 percent to nearly 90 percent.

Before 1980, more educated women were significantly less likely to initiate breastfeeding than their less educated countrywomen; similar negative associations between education and breastfeeding had been noted in most developing countries (e.g., Grant, 1988; Trussell et al., 1992). After 1982, by contrast, Malaysian women who had attended secondary school were significantly more likely to initiate breastfeeding than those with less education. Chung et al. (1991) report a similar reversal between “poor” and “well-to-do” mothers in Singapore, Malaysia’s neighbor. This positive association between education and breastfeeding initiation is consistent with the pattern that has existed in the United States since at least the 1960s (Starbird, 1991).

These educational trends, together with the changes in the educational composition of the sample, contribute to the overall pattern of decline and upturn shown in Figure 1. Over the period considered, the proportion of births occurring to women with at least some secondary education increased markedly from only 12 percent of the sample in 1967 to 55 percent by 1986. This reflects increases in educational attainment in Peninsular Malaysia (World Bank, 1990). Hence, educated women increased their breastfeeding initiation rates, and there was an increase in the “weight” given to those higher rates in defining the population percentages.

The trends are similar for the percentage of infants who breastfed for at least four months (Figure 6), though for this measure the less educated women have higher rates of
breastfeeding *throughout* the period examined and have experienced a greater increase in the 1980s than the more educated women.

**DIFFERENCES BY EDUCATION AND ETHNICITY**

Next, we investigate whether these educational patterns in the rate of breastfeeding are consistent across ethnic groups in Peninsular Malaysia (Figure 7). For Malay women, there is little difference in the propensity to initiate breastfeeding between the two educational groups; a high rate characterizes both groups in all years considered. However, when we consider breastfeeding for at least four months (Figure 8), in every year less educated Malay women are significantly more likely to have breastfed for four or more months than more educated women. The percentage of Malay infants who breastfed for at least four months generally increased over the period considered for both maternal educational groups.

The trends in breastfeeding initiation for educational subgroups of Chinese women in Figure 7 are similar to those seen in Figure 3 for the total sample. Breastfeeding initiation rates declined constantly and precipitously for Chinese women with less than secondary education until the late 1970s, after which they have been erratic. More educated Chinese women had very low rates of breastfeeding initiation in the early 1970s (around 30 percent), but have shown a steady and rapid increase in their propensity to initiate breastfeeding since the mid 1970s. Since 1982, more educated Chinese women have been more likely to initiate breastfeeding than Chinese women with less education. As in the total sample, the relative increase in the proportion of Chinese women with secondary education gives this educational group increasing weight through time. Thus, the arrest of the overall decline in breastfeeding initiation trends for Chinese women noted in Figure 2 is the net effect of differing trends between the two educational groups.
The percentage of Chinese infants with less educated mothers who breastfed for at least four months declined in the 1960s and 1970s and remained fairly constant, at a low level (around 9-10 percent), in 1980s (Figure 8). However, there is no evidence of an increase in this measure for Chinese infants with more educated mothers as there is for breastfeeding initiation for this subgroup.

The trends in breastfeeding initiation for educational subgroups of Indian women have been erratic, due in part to the smaller sample sizes for this group. The rate generally declined until the early 1980s for the less educated group. After 1983, the average breastfeeding rate of the more educated group was greater than the rate of the less educated group, though, because of small sample sizes, the difference is not statistically significant. Here again, the increasing proportion of the total sample that these more educated women comprised gave them an increasingly greater influence on the overall trend among all Indian women shown in Figure 2. However, when we consider the percentage who breastfed at least four months, as for the other two ethnic groups, for Indians also we see less indication of an increase in the 1980s in breastfeeding for infants born to more educated mothers.

DISCUSSION

Retrospective data from MFLS-1, fielded in 1976, and from the MFLS-2 New sample, fielded in 1988, provide independent samples of information on births occurring in and before 1976. Both datasets show similar trends for this period of time, but the data collected in 1988 show higher average reported breastfeeding rates. We have compared reports in 1976 and 1988 by the same women (the Panel sample) about the same pre-1977 births. Although there is an “excellent” degree of agreement between 1976 and 1988 responses about whether a particular child was breastfed, these data also show lower breastfeeding rates reported in MFLS-1 than in MFLS-2. For initiation, some of this
difference appears to be due to the fact that MFLS-1 defined ever breastfeeding ("for a few days") more conservatively than did MFLS-2 ("even if you just tried once or twice"). The remaining difference for breastfeeding initiation and the difference for the percentages breastfeeding for at least four months may be due to a tendency for women to overreport previous breastfeeding if asked at a time when breastfeeding is more popular and/or to underreport if asked at a time when it is less popular.

The MFLS-1 and MFLS-2 data reveal that, following the sustained decline in breastfeeding that began in the 1950s, there has been a sustained increase since the mid-1970s in the percentage of babies in Peninsular Malaysia who initiated breastfeeding. We find that the cessation of the decline in breastfeeding that Haaga (1986) reported for the MFLS-1 data does indeed seem to represent a long-term change. We have examined breastfeeding trends for ethnic and educational subgroups and find that part of the observed change in overall breastfeeding rates is attributable to the changing composition of the Malaysian population. Over time, the percentages of births to population subgroups with higher rates of breastfeeding -- particularly Malays (and more highly educated women for breastfeeding initiation) -- have increased. However, there is also evidence of changes in women's rates of breastfeeding within these subgroups.

The greatest increases in the initiation of breastfeeding occurred for women with at least some secondary education. By contrast, the breastfeeding initiation rate for women with less than secondary education actually decreased slightly over this period. As a result, the nature of the educational differentials reversed. Whereas in the earlier period less educated women were considerably more likely to breastfeed, the opposite was true in the 1980s. Hence, the women who are now less likely to initiate breastfeeding -- less educated women, whose infants are at generally greater risk of illness -- are those whose infants would probably benefit most from doing so.

The reversal in the direction of educational differentials in breastfeeding initiation
in Malaysia produces a pattern similar to that which has prevailed in the United States for several decades. The turnaround in overall breastfeeding prevalence began in Malaysia only a few years after a similar turnaround (from a much lower rate) in the United States. The Malaysian experience suggests that the pace of change in infant feeding practices in developing countries may be different from that in Europe and North America; the revival of breastfeeding need not wait until rates reach the very low levels that characterized the United States in the 1960s and early 1970s.

On the other hand, we do not see a reversal in educational differences when we consider the percentage of babies who breastfed for at least four months. Among Malaysian women who initiated breastfeeding, durations of breastfeeding were shorter for more educated women than for the less educated throughout the entire period considered here. While it is recognized that the WHO recommendations regarding optimal breastfeeding behavior apply to all mothers, regardless of ethnicity, education, or other characteristic, from a public health viewpoint there is some encouragement from the fact that the group which would be expected to benefit the most from longer breastfeeding (children of less-educated mothers) are indeed being breastfed longer. Nonetheless, the duration of exclusive breastfeeding in Malaysia falls considerably short of the WHO recommendation of 4-6 months. In fact, for many subgroups of the Malaysian population, the duration of any (including supplemented) breastfeeding is less than the WHO recommended duration of exclusive breastfeeding.

In some respects, it is surprising that there has been an upturn in the rate of ever breastfeeding in Malaysia. Many of the socioeconomic changes in Malaysia over this time period that may affect women's breastfeeding decisions would lead us to expect less breastfeeding rather than more. For example, greater labor market opportunities for women increase their opportunity costs of breastfeeding; higher incomes increase their ability to afford breastmilk substitutes; better water supply and sanitation and increased
availability of health care reduce the need to breastfeed to shield against health problems; and a greater availability of effective contraceptives reduces the need to breastfeed to postpone the next birth.

We hypothesize that the increases in breastfeeding initiation in Malaysia are not due to reductions in the "costs" of breastfeeding, but rather to increases in the perceived benefits. Over this period, scientists, policymakers, and the general public have become increasingly aware of the health and nutritional advantages of breastfeeding. We hypothesize that this information became available to women (e.g., through the popular press; through encouragement by medical personnel and family planning workers; and through the national breastfeeding campaign, which began in Malaysia in 1976 (Kandiah, 1992) and influenced infant feeding decisions. Studies in other countries (e.g., Popkin, Canahuati, Bailey, and O’Gara, 1991) have suggested that breastfeeding promotion programs can lead to increases in breastfeeding. The fact that the increase in breastfeeding initiation rates seen in the MFLS data is concentrated among the more educated lends credence to this information diffusion hypothesis, as more educated women would presumably have better access to and understanding of this information. However, we see less evidence of an increase when we consider a minimum duration of breastfeeding (four months), and nearly all babies in the data analyzed here received supplementary food or drink within a day after birth. This suggests that information about the timing of supplementary feeding is either not being disseminated and/or not being incorporated into breastfeeding practices, particularly among women most likely to have access to and understanding of this information (the more educated). Breastfeeding promotion efforts in Malaysia should now give more emphasis to the appropriate timing and types of supplementary feeding.
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NOTES

1For more information about MFLS-1, see Butz and DaVanzo (1978).

2This definition of full, or unsupplemented, breastfeeding was used in the MFLSes because research has shown that even minimal supplements have an adverse effect on the morbidity, nutritional status, and mortality of infants (e.g., see Labbok and Krasovec, 1990).

3Kappa coefficient = (observed proportion agreement - expected proportion agreement)/(1-expected proportion agreement) (Cohen, 1960).
Figure 1

Trends in the Percentage of Malaysian Infants Ever Breastfed
MFLS-1 and MFLS-2 New Sample
Figure 2
Trends in thePercentage of Malaysian Infants
Breastfed 4 Months or More
MFLS-1 and MFLS-2 New Sample
Figure 3

Trends in the Percentage of Infants Ever Breastfed, By Mother's Ethnic Group

Source: MFLS-2 New Sample
Figure 4

Trends in the Percentage of Infants Breastfed 4 Months or More, By Mother's Ethnic Group

% Breastfed 4 months or more

Child's Year of Birth

Source: MFLS-2 New Sample
Figure 5
Trends in the Percentage of Malaysian Infants Ever Breastfed, By Mother's Education

Source: MFLS-2 New Sample
(Points not plotted if n<25)
Figure 6
Trends in the Percentage of Malaysian Infants Breastfed 4 Months or More, By Mother's Education

Source: MFLS-2 New Sample
(Points not plotted if n<25)
Figure 7
Trends in the Percentage of Malaysian Infants Ever Breastfed, by Mother's Education and Ethnic Group

Source: MFLS-2 New Sample
(Points not plotted if n<25)
Figure 8
Trends in the Percentage of Malaysian Infants Breastfed 4 Months or More, by Mother’s Education and Ethnic Group

Source: MFLS-2 New Sample
(Points not plotted if n<25)
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