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Abstract

More women are protected from pregnancy in many countries through breastfeeding than through all family planning program contraceptive methods combined. Yet actions to promote breastfeeding have generally not been a significant part of World Bank population projects.

The accompanying paper presents the case for promoting breastfeeding in Bank projects with fertility limitation objectives. It challenges assumptions that may have worked against including breastfeeding components in projects, synthesizes recent research findings that cast light on this subject and outlines why promotive actions are necessary (even in areas where breastfeeding is prevalent) if the contraceptive effects of breastfeeding are to be maintained or enhanced. (This in addition to the well-publicized benefits breastfeeding has for infant nutrition and health.) The paper advocates breastfeeding as a complement to other contraceptives and calls for family planning programs that are designed with local breastfeeding patterns in mind. It examines the compatibility of breastfeeding with women’s other roles and argues that reducing barriers to breastfeeding will increase women’s options for infant feeding.

The record of World Bank projects in breastfeeding promotion is reviewed (29 percent of population-related projects have included explicit actions to promote breastfeeding; 37 percent of Population, Health and Nutrition—or PHN—projects overall). Projects that stand out for their attention to breastfeeding are Jordan I (H) for its training of workers, and Pakistan I (P), Colombia I (N) and Jamaica I (P) for their mass media components. Guidelines are provided to aid project officers in operationalizing breastfeeding promotion in Bank projects aimed at limiting fertility.

Recommended actions to promote breastfeeding in Bank projects entail collecting and analyzing data on breastfeeding patterns and determinants; training health and family planning workers; including breastfeeding promotion and counseling in prenatal and child welfare visits; conducting mass media campaigns; promoting appropriate construction and establishing supportive maternity policies; and encouraging supportive policies at the national level.
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A Case for Promoting Breastfeeding in Projects to Limit Fertility

Promotion of breastfeeding has been a focus of many health and nutrition actions over recent years, as the benefits of breastfeeding have become more well known, awareness has grown of significant declines in its practice, and risks have been documented of inappropriate use of breastmilk substitutes. From a nutrition viewpoint, breastmilk is a complete food for the infant, providing all the nutrients needed for the first months of life. Psychosocially, breastfeeding permits an intimate bonding between mother and child. From an economic perspective, breastmilk economizes on household expenditures on food and requires no utensils, water or fuel for preparation—although lactating women do have higher nutrient requirements and make substantial time commitments to breastfeeding. And from a health point of view, breastfeeding is cited for the anti-infective properties of breastmilk, the lower incidence of diarrheal disease, allergies and other illnesses among breastfed infants, and—by helping to contract the uterus—the way it helps women recover from childbirth. In poor environments, breastfeeding removes the danger of malnutrition caused by dilution of bottle feeds and of infection caused by unhygienic preparation of feeds; bottlefed babies have a higher death rate than those who are breastfed. A recent study in Brazil, for instance, found that weaned infants had 14.2 times the risk of death from diarrhea and 3.6 times the risk of death from respiratory infections of breastfed infants with no milk supplements (1). Recent evidence also suggests a protective effect against breast cancer for lactating women.

Breastfeeding is also important at the aggregate level for the contraceptive effect it exerts through suppression of ovarian activity. The fertility-inhibiting effect of breastfeeding is referred to as lactational amenorrhea or, more precisely, lactational anovulation. The contribution of breastfeeding to diminished fertility is widely acknowledged, and breastfeeding is recognized by demographers as one of the main determinants of fertility. It is a principal factor—perhaps the principal factor—influencing the length of the birth interval (the time between successive births) for the 83 percent of couples in developing countries who, by WHO estimates, do not use modern forms of contraception (4). The 1984 World Development Report analyzed this demographic effect, concluding that breastfeeding reduces considerably the total possible number of births per woman (7). This reduction ranges as high as 6.84 births in Bangladesh, 5.25 in Indonesia and 4.65 in Senegal. In five African countries analyzed for the WDR, breastfeeding accounted for the bulk of reductions from total possible fertility.
Even more recently, Family Health International has estimated that breastfeeding reduces total possible fertility by an average of 34 percent for five countries in Africa, 30 percent for twelve countries in Asia and 16 percent for another twelve countries in the Americas (8). This analysis projects that if the current median duration of breastfeeding were to be halved, total fertility would increase by 27 percent in Ghana and Senegal, 17 percent in Haiti, 37 percent in Indonesia and 33 percent in Nepal.\(^a\)\(^b\).

Though the fertility-limiting effects of breastfeeding are not in doubt at the aggregate level, they can be counted on less at the individual level. The contraceptive effect depends on the type of breastfeeding practiced and wanes as the postpartum period (the time after delivery) progresses. Breastfeeding ideally acts not as a substitute for other contraceptives, but as a complement to them, furnishing protection in the early months postpartum, when the contraceptive effect of breastfeeding is strongest. The consensus of a group of international experts on lactational infertility at a meeting in Bellagio, Italy, in August 1988, was that breastfeeding provides 98 percent protection from pregnancy in the first six months postpartum if a woman is amenorrheic and fully, or almost fully, breastfeeding (9). Optimally, family planning programs take local breastfeeding patterns into account and offer contraceptive methods that do not interfere with lactation; in many cases they can be introduced as the contraceptive effect of breastfeeding wanes. In this way, fertility, nutrition and health objectives can work in concert.

Length of the birth interval influences child mortality as well as fertility (see Annex 7). In developing countries, children who are born after short intervals (generally within two years of a previous sibling birth) are 60-70 percent more likely to die in infancy than are children born after a longer interval. The chances of dying during infancy rise even

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\(^a\) The exact physiological mechanisms by which breastfeeding influences fecundity and fertility are an area of ongoing research. Normal ovarian activity is interfered with in a number of ways through the stimulus of suckling. The hormone prolactin, which stimulates the production of breastmilk and suppresses other hormones necessary for normal ovarian activity, is thought to be pivotal. Nipple stimulation through sucking increases prolactin levels, and high levels are associated with absence of menses (amenorrhea) and absence of ovulation (anovulation). The prolactin response to suckling declines as the postpartum period progresses, and levels fall when breastfeeding ceases or diminishes below a certain threshold, at which point menses and ovulation resume.

In some women the functions of menses and ovulation resume in the same cycle; in others anovulatory menses occurs first. Research supports the notion that ovulation before first menses is most likely in non-breastfeeding women, intermediate in partially breastfeeding women and least likely in fully breastfeeding women.

The longer-term contraceptive effect of breastfeeding also bears further investigation. Some recent studies have demonstrated lower fertility in breastfeeding women (compared with women who do not breastfeed) even when menstruation has resumed. In physiological terms, this might support the notion that fertilized ova do not implant well in breastfeeding women, or may be related to societal practices, such as abstinence or lower frequency of coitus in breastfeeding women.

\(^b\) Estimates of contraceptive prevalence for the developing world vary widely. The 1984 World Development Report estimated a range from 6 percent in Sub-Saharan Africa to 65 percent in Asia, but these figures include use of inefficient methods (i.e., including ones with relatively higher failure rates). World Fertility Survey data estimate use at one-third of women in the 29 developing countries surveyed, but 31 percent of those women were using inefficient methods (5). In 1987, the Population Crisis Committee estimated the contraceptive prevalence in developing countries (excluding China) at 27 percent (6).
further, to 80-90 percent, when the earlier child has died. And children whose own birth is followed quickly by another are also at greater risk—as high as 77 percent when a second birth follows within twelve months (10).

Yet despite the advantages breastfeeding offers for lengthening the birth interval, particularly where constraints of supply or demand limit the use of modern contraceptives, only infrequently has it been promoted in projects and programs explicitly aimed at limiting fertility. The problem is compounded when western influences inadvertently raise barriers to breastfeeding, narrowing women's perceptions about infant feeding choices open to them. The result can be a rise in fertility. The purpose of this paper and the accompanying annexes is to:

- argue for the inclusion of breastfeeding considerations in population projects;
- illustrate why breastfeeding promotion is necessary to maintain or enhance its contraceptive effect and to afford women full choice in infant feeding practices; and
- outline guidelines for operationalizing breastfeeding promotion activities in World Bank projects with fertility limitation objectives.

**Need for Breastfeeding Promotion**

Breastfeeding has often not been promoted for its contraceptive effect for perhaps three reasons. One is that in those regions of the world in which the contraceptive effect of breastfeeding is most needed, breastfeeding is still the rule rather than the exception. Promotive efforts might thus not be regarded as necessary, relative to other needs. The second is that declines in breastfeeding are sometimes assumed to be inevitable accompaniments of modernization and, if compensated by corresponding increases in the use of modern contraception, to have negligible demographic impact. The third is that breastfeeding is not regarded as a completely reliable contraceptive for the individual woman after initial months postpartum. While none of these statements is false, they bear qualifications that argue for the explicit inclusion of breastfeeding activities in projects with fertility limitation objectives.

**Issue No. 1:** Breastfeeding does not need to be promoted in areas where it is still the norm. This assumption needs qualification on two counts. First, the type of breastfeeding

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a. In view of the importance of AIDS, particularly in Africa, the question has been raised of the possibility of transmission of human immunodeficiency virus (HIV) from infected mothers to their infants through breastmilk. To date there have been several cases reported of AIDS transmission through human milk; the risk appears to be higher when mothers are infected after giving birth than if they carried the virus before they got pregnant (2). According to WHO, if such transmission does occur, the relative contribution of infection through breastmilk is probably small, compared with placental transfer and intrapartum transmission; evidence suggests that between 25 and 50 percent of all infants born to mothers with AIDS will be infected by the AIDS virus through placental transfer and intrapartum transmission.

WHO current policy (1987) is that, although the risk of HIV transmission through breastfeeding has not been defined, the immunologic, nutritional, psychosocial and child-spacing benefits of breastmilk offset the probably small possibility of transmission through breastmilk and that breastfeeding should continue to be promoted, supported and protected in both developing and developed countries. Breastmilk is especially important in preventing the intercurrent infections that can accelerate progression of HIV-related disease in infants who are already infected. In individual situations where the mother is considered to be HIV-infected, the benefits of breastfeeding should be compared with the "theoretical, but apparently small, incremental risk to the infant of becoming infected through breastfeeding" (3).
practiced is critical to the length of the contraceptive effect. Second, the continuation of traditional breastfeeding practices depends on a supportive environment, to which health and family planning personnel and services can contribute substantially.

**Type of breastfeeding practices.** The contraceptive effect of breastfeeding is related to several variables: duration of breastfeeding, frequency and duration of suckling, administration of supplements to the infant, nutritional status of the mother, and geographic, social and cultural factors (11;12). Women with the longest postpartum amenorrhea are those that practice long, frequent and exclusive breastfeeding. Practices that maximize mother-infant contact, such as feeding on demand, night feedings and unsupplemented breastfeeding, are associated with longer postpartum anovulation. WHO's 1981 Collaborative Study on Breastfeeding in nine countries found that 85 percent of total variability among countries and groups within countries in the return of menstruation was attributable to differences in breastfeeding behavior (see Annex 2).

Therefore, breastfeeding is not an either/or state, but a question of degree. Women who assert that they are breastfeeding may be doing so in ways that threaten the contraceptive effect, as through early supplementation with other foods, mixed feeding in which supplementation precedes suckling at the breast and other variations. The result may be diminished contraceptive protection even in areas where breastfeeding is thought to be universal and of considerable duration (see Annex 3). Because the contraceptive effect of breastfeeding is influenced by the several variables mentioned above, the effect differs at the aggregate level between countries. In Sri Lanka, for example, it has been calculated that each additional month of breastfeeding can mean .7 months of contraceptive protection on a population-wide basis. Lower coefficients have been found for some other countries: .5 for Colombia and Indonesia, .4 for Peru and .3 for Jordan (13).

One analyst refers to early mixed feeding (breast and bottle) as the "triple nipple" problem and speculates that the differences in infant feeding practices in Kenya and Indonesia may account for much of the difference in fertility between the two countries (14). In Indonesia, early use of breastmilk substitutes is uncommon, frequency of suckling is higher and duration of breastfeeding is longer. UNICEF country data support the notion of widespread early supplementation in parts of Africa: in Kenya and the Congo, close to 50 percent of infants were given some solid food in addition to breastmilk within the first month or two of life (15). A recent survey in Pakistan found that only 10 percent of infants aged two months were being exclusively breastfed (16).

**Supportive environment.** In humans, breastfeeding is a learned rather than intuitive art, sensitive to environmental pressures (17). There is no assured success in breastfeeding in the absence of a supportive environment. It cannot be taken for granted that as other changes are introduced into the environment, breastfeeding will endure, particularly in a way that maximizes the contraceptive effect.

Women's attitudes toward infant feeding usually reflect the society in which they live. Migration that removes women from traditional support networks, exposure to attitudes among health and family planning workers that discourage breastfeeding, negative influences in the mass media, and childbirth in institutions that do not consciously promote breastfeeding can all work, albeit inadvertently, to weaken traditional breastfeeding practices. Women may give up before lactation is fully established or cease breastfeeding prematurely, when proper guidance or postponed supplementation might have enabled them to establish or continue breastfeeding successfully. A survey in Lagos found that although most women breastfed their newborns, some 20 percent did not continue the
practice beyond the first month, and two-thirds were supplementing by one month; less
time with mothers-in-law, who traditionally counselled new mothers in breastfeeding,
was considered a major factor in the change (18).

Further, in the US WIC (Women, Infants and Children) program, which provides
milk supplements to low-income families, milk distribution has been correlated nega-
tively with breastfeeding. One study showed that women who participated in the pro-
gram were only one-sixth as likely to breastfeed as comparable non-participants (19).

As coverage of health services widens, their policies and practices influence women's
decisions on breastfeeding. The WHO study found, for example, that in Ethiopia and
India, breastfeeding was less common among women who received the greatest amount
of prenatal care, and that breastfeeding was more common among women who delivered
at home than among those who delivered in hospitals (20;12).

Further evidence for these points comes from the 1983-86 infant feeding studies
conducted by the Population Council in Bangkok, Bogota, Nairobi and Semarang, which
found a markedly high rate of very early supplementation (often after the first month of
life) in all sites. In each locale, the studies identified significant negative practices—in
terms of effects on infant feeding—associated with modern Western health care (21).

Issue No. 2: Declines in breastfeeding are inevitable and will have negligible demo-
graphic impact if compensated by increases in the use of modern contraception. Both parts
of this assumption need qualification, the time horizon being critical.

Inevitability of declines. In the face of urbanization, female education and labor force
participation outside the home, as well as the increasing availability and acceptability of
modern contraception, few analysts believe that it is possible—or even desirable—to
maintain over the long run traditional practices of lengthy exclusive breastfeeding. This
is not the same as saying that all declines are inevitable or desirable. Recent reversals of
debates in such industrialized areas as the US, Scandinavia, Australia and Eastern Europe
provide evidence to the contrary. Efforts to promote breastfeeding in the US, for instance,
have met with success: Between 1971 and 1983, the proportion of women breastfeeding
at hospital discharge rose from 25 to 62 percent (with the government having set a target
of increasing that proportion to 75 percent by 1990) (22). In both the US and the UK,
breastfeeding is positively associated with education (23). And, as pointed out above,
woman in many places successfully combine breastfeeding with employment. Declines in
breastfeeding in today's industrialized countries, moreover, occurred at a time when
breastfeeding was not advocated in either medical or patient education, the medical
literature having not clearly supported breastmilk as a superior infant food until the late
1960s.

In developing countries the situation regarding breastfeeding trends appears mixed,
with many areas reporting declines, while arrests in declines or even increases have
occurred in certain areas or among certain subgroups—particularly where breastfeeding
promotion activities have been under way. The picture is complicated by differing refer-
ence points, as well as variables of age, education, income and urbanization. World
Fertility Survey data collected in the 1970s estimated that between 74-98 percent of
women initially breastfeed (24), but the overall historical trend has been toward declines
in both incidence and duration as countries modernize.

Some analysts believe that breastfeeding prevalence is declining in all less developed
countries for which information is available (e.g., 25). Others are more optimistic, point-
ing to a mixed situation, with increasing trends in many populations, rather than a
uniform decline (26). Increases or stability in breastfeeding have occurred in Jamaica, Sri Lanka, the Dominican Republic, Guatemala, Singapore and Jordan—many of which are countries where breastfeeding has been consciously promoted in recent years (27).

One important consideration is the type of decline that is tolerable. Some declines in duration of exclusive breastfeeding—from prolonged to intermediate lengths—may be acceptable or even recommended from a nutrition point of view, since over time the nutrient requirements of young children become greater than those that can be met by breastmilk alone.

Declines in incidence or dramatic declines in duration (from lengthy to short periods) can be more serious. First, they may represent losses in contraceptive protection at a time when many women may not desire modern methods of contraception (some studies have revealed lack of demand based in part on beliefs about reduced fecundability—the physical capacity to conceive—during the postpartum period) (e.g., 28;29). In certain cultures, cessation of breastfeeding also signals the end of postpartum sexual abstinence, which in Sub-Saharan Africa contributes substantially to reductions in potential total fertility (e.g., 30;31;32). Second, even if modern contraception is desired, such declines may place greater demands on public family planning services than can presently be met. And third, infant health and nutrition may be placed at risk, particularly in situations of poverty and environmental contamination.

Evaluation data on breastfeeding programs are not plentiful and some that do exist have methodological problems. Nevertheless, a 1985 review of evaluations of 32 programs revealed a consistently positive direction of findings, suggesting that a wide range of breastfeeding promotion programs may be effective in increasing the incidence and duration of breastfeeding and in reducing the incidence of health problems (33). A more recent review of program effects in several countries has corroborated those findings (34).

Compensation for declines. From a demographic viewpoint, the loss of contraceptive protection due to changes in breastfeeding can be offset by other factors that determine fertility: modern methods of contraception, older age at marriage, and abortion. Recent declines in breastfeeding in India, Indonesia, Korea and Thailand were offset by these other factors (5). But if a country’s uptake of contraception is delayed, increases in fertility can result. In Kenya, for example, a decline in breastfeeding has not been fully compensated, despite a rise in age at marriage. This situation has been associated with a rise in the total fertility rate from 6.6 to 8.1 between 1950 and 1980 (35).

It has been projected, for example, that if mean lactational amenorrhea in Bangladesh were to decline from the 1976 level of 21.7 months to 12 months, contraceptive use would have to more than triple, from 9 to 31 percent to compensate and hold constant a total marital fertility rate of 6.3. If breastfeeding were to decline even further, contraception rates would have to rise even more to compensate: to 45 percent, based on lactational amenorrhea of six months, and to 52 percent, based on lactational amenorrhea of three months. Reductions in the marital fertility rate would, of course, call for even higher rates of contraceptive use (25).

Therefore, in areas where a dramatic rise in contraceptive prevalence is unlikely to occur in the near future, the importance of preserving breastfeeding as an inhibitor of fertility is great. Using typical values for Sub-Saharan Africa of the principal proximate determinants of fertility, estimates are that the elimination of breastfeeding (and postpartum abstinence) without a commensurate increase in contraception would produce a 72
percent rise in fertility. Expressed in births per woman, the average observed fertility rate of 6.6 would increase to 11.4 (35).

Even partial declines in breastfeeding would have serious demographic effects, according to the analysis by Family Health International referred to earlier. That analysis projects that a 25 percent reduction in breastfeeding duration in five countries in Africa can translate into a 12 percent rise in the total fertility rate of those countries, while halving the duration of breastfeeding can mean a 26 percent rise. Figures for twelve countries in Asia are 11 percent and 23 percent (8).

In many areas of the developing world, it will take time before modern contraception is both universally available and widely utilized. While efforts are proceeding to establish distribution and marketing networks and to generate demand, it makes good sense from a demographic point of view to preserve and promote breastfeeding practices. This will also help ensure that women who desire to breastfeed need not make a choice between “modern” and “traditional” practices, but can combine the best of the two.

In developing countries, dramatic declines in breastfeeding have been most noted in urban areas, in association with such factors as higher education of women, greater work outside the home and younger age of the mother. The World Fertility Survey found particularly striking rural/urban differences in Peru, the Philippines, Indonesia, the Dominican Republic, Panama and Haiti. While such declines may be regrettable from other points of view, the greater availability of modern contraception in cities may diminish concern about the fertility impact of lessened breastfeeding. But concern is warranted. Data from other developing countries—Malaysia, Colombia and Costa Rica among them—indicate that even where family planning programs have been successful, a large proportion of women do not use contraception in the first two years after giving birth. In Colombia, for example, at six months postpartum, 72 percent of women are not using contraception and more than one-third of those are not breastfeeding (36). If women are not using contraceptive services, breastfeeding promotion can help reduce the risk of pregnancy.

**Issue No. 3: Breastfeeding is not a reliable contraceptive for the individual woman.** Timing of return of menses and ovulation varies across and within communities because of variation in breastfeeding practices and other environmental factors. One such factor is maternal nutrition status; menses tend to resume later in more poorly nourished women. (It is not clear whether this is caused by malnutrition itself or by a more intensive suckling pattern in response to inadequate milk output.) (11) Mean length of amenorrhea in Bangladesh, where breastfeeding is practiced intensively and nutrition status is low, is 21.7 months, according to World Fertility Survey data. In Costa Rica, where breastfeeding durations are short, mixed feeding common and women better nourished, lactational amenorrhea lasts only 3.5 months on average (25).

Further, even for women who are fully breastfeeding, the contraceptive effect wanes over time, so that the probability of anovulatory first menses (as a marker to begin other types of contraception) diminishes with each passing month. Strengthening breastfeeding practices (e.g., by supplementing only after the breast has been given) can reduce some of this variation. One estimate based on data from Scottish women calls for at least five suckling episodes more than ten minutes in length (65 minutes minimum daily) to suppress fertility (37). Nonetheless, for these reasons breastfeeding has generally not been recommended as the sole contraceptive method for the individual woman who definitely wishes to postpone pregnancy.
This is not the same, however, as concluding that breastfeeding promotion has no role in population programs. In situations where acceptable contraceptives are available, family planning services can take breastfeeding into account in several ways: They can include breastfeeding variables and determinants in KAP and other survey work, offer contraceptives that do not interfere with lactation, and work to reduce barriers to breastfeeding. These actions can promote program efficiency and ensure that population objectives work together with health and nutrition objectives. They will also make it easier for women who choose to breastfeed to do so.

Where fertility limitation is less of a conscious objective among project beneficiaries or where modern contraceptives are unavailable or unacceptable, breastfeeding may exert one of the few restraints on fertility. In these cases, early population projects can promote breastfeeding to enhance or maintain its contraceptive effect as other appropriate services are instituted. This will help avoid increases in fertility due to declines in breastfeeding and postpartum abstinence that are not compensated by uptake of modern forms of contraception.

**Advantages for Fertility Limitation**

Breastfeeding offers two principal advantages for lengthening the birth interval and limiting fertility:

- *Breastfeeding can reduce the risk of pregnancy for women for whom modern contraception is either not available or not acceptable.*

  Lactational amenorrhea was estimated as providing approximately one-third more protection against pregnancy in developing countries than all family planning program contraceptive methods combined, according to data available in the mid-1970s (38). Whether for economic, cultural, religious or other reasons, certain families do not presently accept the idea of limiting births or the use of many types of contraception. These same families, however, are likely to be receptive to the positive effects breastfeeding has on infants and young children (see Annex 5).

- *Breastfeeding can increase the efficiency of family planning programs by serving as a fairly reliable contraceptive during lactational amenorrhea.*

  By reducing the need for services in the early postpartum period, breastfeeding can play a role in using scarce family planning resources efficiently. If breastfeeding is providing a contraceptive effect, use of modern contraception may represent duplicate coverage. When family planning resources are limited to the point that coverage of child-bearing women cannot be universal, the most judicious use of those resources may not be to supply women with modern contraception in the immediate postpartum period, but to maximize the natural contraceptive effect of breastfeeding, supplying additional methods of fertility control as the need arises, either at the time of introduction of supplementation or at resumption of menses (see Annex 6).

An inverse association between breastfeeding and contraceptive use in developing countries has been documented in several studies. It was found in Thailand, for example, that women who opt for modern, reversible contraceptive methods usually wait until the return of menses before initiating use (39). In part because the return of menses is an important stimulus for postpartum contraceptive use, the proportion of Thai women exposed to risks of unwanted pregnancies for any extended period of time postpartum was quite modest.
Though it is estimated that 5-10 percent of women conceive during lactational amenorrhea (because ovulation in some women, particularly non-breastfeeder, can resume before first menses) this failure rate is comparable in effectiveness to that of many contraceptives (40). Studies in India and the US that have compared the pregnancy rate during lactational amenorrhea with those of other forms of contraception have found it to be comparable, given variation in patient compliance, with those of oral contraceptives, the condom or the diaphragm, and more effective than coitus interruptus, rhythm or douche (41). Although orals have a higher theoretical efficacy, their use-effectiveness in developing countries is often around 10 pregnancies per 100 women-years of exposure, making breastfeeding comparable in reliability in many settings (42). Moreover, breastfeeding can be relatively easily combined with barrier methods to enhance contraception as the natural effect wanes in the latter months of lactational amenorrhea (43). And, finally, the incidence of conception during lactational amenorrhea could perhaps be substantially reduced if breastfeeding intensity were increased.

The above figures on conception during amenorrhea do not take into account length of amenorrhea or type of breastfeeding practiced. A study in Chile concluded that ovulation before first menses was most likely in non-breastfeeding women, intermediate in partially breastfeeding women and least likely in fully breastfeeding women (44). In groups in a WHO Collaborative Study in which more than 10 percent of women were using contraception, the percentage with a long birth interval was lower than in those in which the majority of mothers breastfed for at least 18 months in the absence of contraception. Further, a study in the Philippines revealed a higher (50 percent compared with 20 percent) proportion of pregnancies among women who were bottlefeeding by 12 months postpartum than among women who were fully breastfeeding or breastfeeding with supplements, despite a higher use of modern contraception among women in the bottlefeeding group (41).

Introduction of modern contraception at resumption of menses may be of particular interest in areas noted for high rates of discontinuation of contraceptives. Earlier (e.g., postpartum) introduction of contraception may be counterproductive since discontinuation may coincide with the return of fecundability, while the protective period of the modern contraceptive may have overlapped with the protective period of breastfeeding. (One study has recommended that if monthly discontinuation rates reach 8 percent, postpartum strategies to provide contraceptives at a set number of months after giving birth or at the return of menses are the most effective) (45). Work in Bangladesh has shown, for example, that the “post-amenorrheic strategy” (i.e., delaying recruitment into family planning programs until women resume menstruation) is superior in communities where the expected duration of postpartum anovulation is relatively high or contraceptive continuation rates relatively low (46).

Another consideration is sexual abstinence during the breastfeeding period, based on cultural beliefs that semen contaminates breastmilk. This practice continues in many parts of Africa and the Pacific, including areas of Indonesia. Often where these practices are combined, the length of breastfeeding determines the length of postpartum abstinence (47). In such cases, the birth interval is obviously lengthened in a highly effective way, providing strong grounds for promoting breastfeeding. Declines in breastfeeding can thus influence fertility through their effect on duration of postpartum abstinence. In areas where cultural norms are changing and wives are resuming relations with their husbands
sooner after birth, educational messages may want to stress that coitus is not detrimental to breastmilk.

Finally, because breastfeeding offers multiple benefits for maternal and child health, from the family planning perspective its promotion can be a low-cost intervention. The cost of promotion programs can be shared among several sectors: nutrition, health and family planning, as well as labor (in maternity policies) and education (in school curricula and informal education programs).

**Financial Costs of Infant Feeding**

Relative to other infant feeding methods, the financial costs of breastfeeding are low at both the household and aggregate level. Breastfeeding requires little additional expenditure for the family or government and provides savings for both. Compensating for breastfeeding declines, on the other hand, is costly—both in terms of costs to the household and foreign exchange requirements (i.e., for infant formula and contraceptive supplies) (48)—and offsets progress in increasing use of contraceptives and raising age at marriage.

In terms of the household, studies have shown that the costs of items needed to be purchased for breastfeeding are less than those of other feeding methods (37), since it is cheaper to supplement a lactating woman’s diet than to buy and prepare breastmilk substitutes. UNICEF data estimate that a month’s supply of breastmilk substitutes for a six-month-old child ranges from US $3.00-5.00 in the People’s Republic of Yemen to $45.00 in Ethiopia, with an average cost of $22.00 per month in developing countries (20;15). The monthly cost of formula for a three-month-old infant in Pakistan is $18 (16). These costs typically represent anywhere from 8 to 120 percent of the minimum wage, increasing the possibility that infant formula will be diluted. Further, they do not include equipment or fuel costs for preparation. Infant formula appears to be least affordable in Africa and Asia and least expensive, relative to income, in the Middle East.

Although lactating women have increased consumption needs, food costs to support lactation have been shown to be lower than the costs of infant feeding. In the US, for example, family expenditure for bottlefeeding for a three-month-old infant was estimated in 1975 at $0.50-0.75 per day, while increased maternal intake required for breastfeeding would cost $0.17-0.21 (49).

If the high cost of infant formula causes it to be diluted, energy-protein malnutrition is likely to result. Rehabilitative services for malnutrition can be costly, as can those caused by dehydration due to diarrheal disease, which is often brought about by unhygienic preparation of breastmilk substitutes. Hospital savings can accrue from smaller purchases of formula and the intravenous fluid used to treat children dehydrated from diarrheal disease.

Foreign exchange requirements can also be considerable. It is estimated that in the Philippines the equivalent of $33 million was spent in one year on breastmilk substitutes, many of them imported (49). The annual projected cost of breastmilk substitutes for all the infants in Papua New Guinea was estimated at $12.5 million in 1976 (50). And by one 1977 calculation, it would cost approximately $15 billion to feed adequately by artificial means the estimated 120 million infants in the world (50).

Even though cost data on breastfeeding promotion programs are limited, comparative analysis done on interventions for diarrhea control rated breastfeeding promotion as high
in effectiveness and feasibility, particularly for urban areas. The cost of conferences for hospital staff and other training or promotive practices has been as low as $0.11 per mother and child exposed; the same figure for mass media campaigns was $0.10. The analysis concluded that a combination of information and support programs, together with changes in hospital routines, was likely to be the most cost-effective package of interventions (51).

**Breastfeeding, Women’s Time and Employment**

An important factor in assessing the relative benefits of breastfeeding is the time it demands from women. This can be expressed as the opportunity cost of women’s time—the value of activities foregone because of breastfeeding. Though generally considered in relation to women’s participation in the formal sector labor force, the concept is also valid in informal income-producing work and in non-remunerated household activity. In all three situations, women may forego other opportunities in order to attend to the time demands of breastfeeding, especially the type of frequent breastfeeding that is conducive to anovulation. Time for breastfeeding must compete with time demands for other child care, household management, food production, fuel and water acquisition, and income-generating activities, among other tasks.

Unfortunately, the empirical evidence on the time demands of breastfeeding is limited and exhibits methodological problems. The little that exists does not point in one direction. A review of the literature reported on studies in three developing countries (52). Breastfeeding time commitments cited were 50 minutes per day in Ghana, 56 minutes in North Cameroon and 69-116 minutes in the Philippines, with more time being spent by higher-income women in the latter case. In Ghana and the Philippines, time costs were compared between use of breastmilk substitutes and breastfeeding. In Ghana, preparing and providing breastmilk substitutes was found to be at least three times as time-intensive as breastfeeding (132-201 minutes per day versus 40-48 minutes per day). Contrary findings emerged in the Philippines, where breastfeeding was found to be twice as time-intensive as use of breastmilk substitutes (69-116 minutes versus 22-29 minutes). This latter analysis, however, did not factor in preparation time for artificial feeds, often considered the most time-consuming aspect.

Of course, one advantage that use of breastmilk substitutes offers to the mother is that feedings can be done by someone else—older sibling, grandparent or other caretaker. Though artificial feeding still imposes time demands on someone in or near the household, the opportunity cost may be lower for people outside peak productive years or for whom feeding is part of routine childcare responsibilities. A further consideration, however, is that women often combine breastfeeding in joint production with other tasks (in contrast with breastmilk substitutes, which generally do not allow other tasks to be performed at the same time) and breastfeed at night, when a baby sleeping with the mother may not greatly disturb rest hours (37). In these situations opportunity cost would be lower.

*Breastfeeding and employment.* Despite the relevance of opportunity cost to all types of women’s activities, the study that has been undertaken in this area has generally been

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a. Someone other than the natural mother can also breastfeed. Wet-nursing has historically been a form of breastfeeding and still occurs in some cultures (e.g., 53).
limited to formal sector employment, usually perceived as incompatible with child care. There, women have to be absent from home for extended periods of time, and on-site facilities for breastfeeding infants are rarely available. The choices usually are to express milk from the breast (to be fed to the child during the mother’s absence), to use artificial feeds during mother’s absence and breastfeed when she is at home, or to wean the infant completely. Several studies have shown that a need to return to work can interfere with breastfeeding, especially among lower-income women whose work situation may offer little flexibility for feeds. A 1981 study in the US found that only 20 percent of mothers whose infants were six months old were breastfed if the mother was fully employed, compared to 50 percent of mothers who were not employed (54). Among Mexican-American women in Los Angeles (many of whom worked as domestics or in factories), 44 percent of those who did not breastfeed stated work plans as a reason for not doing so (55). Fewer women planned to breastfeed if they intended to return to work soon after delivery; this same group tended to comprise women who did not have economic support from the baby’s father and women who were not married or not planning to marry. Work plans seemed to influence duration of breastfeeding as well as incidence. Many women who initiated breastfeeding stopped when their need to return to work made breastfeeding incompatible.

Another example is from southern Florida (US), where Haitian mothers of low socioeconomic status who did not breastfeed their US-born children often cited the need for employment outside the home as one reason for their decision (56). Most of the women were recent immigrants who lived in new consensual unions since coming to the US and without an extended kin network to help in childcare; several were told that breastfeeding was not done in the US. The author concluded that bottlefeeding for this group was part of an acculturation process in an environment in which breastfeeding was not encouraged and paid employment was necessary for survival.

Overall, however, empirical data have not clearly demonstrated that employment outside the home is the major—or even a major—reason for not initiating breastfeeding, starting bottlefeeding or terminating breastfeeding. In a review of 81 studies in 40 developing and industrialized countries, only in four studies did high percentages (i.e., more than 20 percent) of women cite employment as a reason for not breastfeeding (57). In four other studies (from Finland, Nigeria, the Philippines and Chile) employed women either were more likely to breastfeed or there was no significant difference in breastfeeding rates between employed and non-employed women. Similarly, the 1981 WHO study found it uncommon for women to say they had stopped breastfeeding specifically because of a need to return to work. In Norway, research has shown that breastfeeding is more common among working women than among those who do not work outside the home (17). And in Northern Ireland, intention to breastfeed was higher among women employed full-time and among those who intended to return to work after maternity leave. Further, breastfeeders were more likely to carry through their original intentions regarding work than were bottlefeeders, while housewives had the lowest percentage of breastfeeders (58). Though these findings should not be used to claim that breastfeeding does not interfere with alternative uses of women’s time, they do show that a one-way, singular causality is not necessarily the case.

In a major study of infant feeding in four sites, work outside the home was strongly associated with early use of bottlefeeding in two sites (Bogota and Bangkok) but not in the other two, Nairobi and Samarang. In Bogota and Bangkok, virtually all women
working away from home were separated from their infants during working hours, while women in Semarang lived in environments where it was easier to combine breastfeeding and work. Particular attributes of working away from the home—working conditions, scheduling and childcare arrangements—appeared to be critical influences on infant feeding practices (59).

Other data suggest that a long enough time at home to establish lactation firmly may be key. A self-selected survey of almost 600 employed women who breastfed (overwhelmingly from the US) revealed that when mothers returned to work had a greater effect on breastfeeding than how many hours they worked per week. The likelihood of early weaning increased for women who returned to work—even on a part-time basis—before the infant was 16 weeks old, while breastfeeding women who worked at least 40 hours per week but returned to work after four months postpartum were more likely to continue nursing longer (60). Maternity leave of such length, however, is not an option available to many women.

Some anecdotal evidence points to a maternal view of the time commitments required for breastfeeding as “time well spent.” Women in Honduras who worked outside the home, for example, claimed that the time they spent breastfeeding was the only time during the day they stopped working and relaxed (52). A study in Nigeria found that while working mothers reduced their overall child care time as wage rates increased, duration of breastfeeding was positively related to wage rate (ibid.). Mexican-American women in Los-Angeles who breastfed gave “easier” as one of their reasons for nursing, in addition to health benefits for the baby and encouragement by medical staff (55). Urban women in Mali do not define breastfeeding as constraining since infants are welcome everywhere, are nursed in public, and by the age of four months are expected to find the breast themselves, leaving the mother’s arms free for other tasks (53). And US women surveyed who mixed employment and breastfeeding tended to value the experience and think well of themselves as mothers (60).

**Working environment.** To the extent that there are opportunity costs, one policy alternative is to lower them by making the work environment more hospitable to breastfeeding. Work environments often derive from a model centered on a male workforce, with scant consideration of women’s particular needs as both workers and mothers. They enforce a dualistic model that separates public (work) and private (home) spheres. International Labour Organization conventions passed in 1919 regarding maternity leave, nursing breaks and creches have only rarely been implemented in their full spirit. Other possibilities are flexible working hours, job sharing and more part-time work. Restructuring the work environment to make it more compatible with female wage labor—a trend likely to increase over time—is a viable option with considerable possible benefits for health, nutrition and fertility.

In China, for example, where some 90 percent of women are employed, women in the industrial sector or civil service jobs are given two months of paid maternity leave. On-site creches enable women to take two nursing breaks of thirty minutes each (61). Many other countries have enacted similar legislation (62), but it sometimes remains unenforced or, ironically, works against women. In some cases, employers may not hire married women or may keep the number of female employees below the minimum requiring establishment of creches (54;63).

Yet a work environment conducive to women’s dual role would appear to have benefits for employers as well. Higher productivity might result from a greater satisfac-
tion with work (as possibly reflected, for example, in a lower turnover rate among employees) and less absenteeism due to infant illnesses. A reorientation toward the needs of women workers as mothers would diffuse the opportunity cost to the individual household and give women greater choice in reconciling their productive and reproductive roles. If, as some research has shown (64), women's work outside the home improves the probability of child survival (through the income effect on child health), work environments that are compatible with both employment and breastfeeding can contribute to infant and young child health in a combined way. Projects with income-generating components for women, for example, could have creches and build in time for nursing breaks.

In short, contrary to many common perceptions, there is little empirical evidence that women's employment of itself need necessarily affect breastfeeding negatively. This is not to suggest, however, that maternal employment is not a factor in decisions regarding breastfeeding. In most situations, modification of the work environment would increase women's options regarding infant feeding, so that women who choose to breastfeed would not incur a high opportunity cost for that decision.

The Record in World Bank Projects

A desk review of 68 past and ongoing World Bank projects in population, health and nutrition identified some type of breastfeeding promotion activity in 25 projects—37 percent (see Annex 1). The most frequent type of activity (15 projects) has been nutrition or health education that included messages regarding breastfeeding. Ten projects have featured mass media educational campaigns, eight have provided for counseling on lactation management, and five have trained personnel in lactation. Four projects have explicitly recognized the value of breastfeeding for birth spacing and four have made specific provision for data collection regarding breastfeeding prevalence, duration or practices. In the latter group, a project-sponsored study on the use of commercial infant formula helped lay the groundwork for the national breastfeeding campaign in Brazil. One project called for physical infrastructure that promoted breastfeeding.

All four nutrition projects, the one health and nutrition project, eleven of thirty-eight population, population and health, or population, health and nutrition projects, and nine of twenty-five health projects have promoted breastfeeding in some way. The fewest number of projects with breastfeeding promotion activities has been in Sub-Saharan Africa and the Near East, areas that present special challenges to the adoption of modern contraception.

Breastfeeding promotion is thus not without precedent in World Bank projects. But there appears to be considerable scope for stepping up both the number and extent of such activities in future projects. Even the most common activity, that of nutrition education that includes breastfeeding, has been present in only 22 percent of projects. Further, the full impact of the most frequent types of activities—general nutrition education and mass media campaigns that concern breastfeeding—is likely to be constrained in the absence of promotive attitudes and practices by service providers and of appropriate practices in hospitals. The record in World Bank projects in these areas, as well as that of the data collection necessary for designing appropriate strategies to maximize contraceptive effect, is not strong.
Guidelines for World Bank Projects

Knowledge of local beliefs and practices is needed to develop a specific strategy for promoting breastfeeding most appropriate to community conditions, and these will differ across communities. Despite the need to tailor the particulars of a promotion campaign to community conditions, core objectives common to all might be to:

- alert policymakers, through country dialog, to the implications of declines in breastfeeding. Officials in ministries of planning, health, education, labor and trade need to be aware of the costs implied by falls in breastfeeding and of the ways multisectoral promotion programs can be mounted. For policy dialog, information on current breastfeeding patterns, trends over time and determinants is extremely useful. If such data are not already available, their acquisition might be incorporated into sector work in appropriate countries.

- promote exclusive breastfeeding (i.e., without supplementary feeds) for a minimum of four months (during which breastmilk provides all the nutrients the infant requires) and discourage bottle feeding during that time. The point at which supplementation should begin is the subject of ongoing research and likely varies across and within communities since it relates more to developmental than chronological age. To prevent growth faltering, four to six months presently appears to be a conservative guideline for sufficient maternal lactation capacity. As far as infant health is concerned, unsupplemented breastfeeding, particularly for the first six months, has been shown to be more beneficial for infant survival during the first year of life. Ideally, exclusive breastfeeding would be characterized by frequent suckling on demand by day and night.

- promote weaning practices that meet the twin objective of maximizing the contraceptive effect of breastfeeding and supporting child health. Once supplementation begins, it should not interfere with breastfeeding. Appropriate educational messages would focus on maintaining high frequency, intensity and duration of suckling, both to suppress ovarian activity and to help maintain milk production adequate for a longer period of unsupplemented feeding. They would emphasize gradual introduction of weaning foods at a time appropriate by traditional community standards; little use of formula and cow’s milk; feeding with a cup and spoon, rather than a bottle (so as not to discourage suckling at the breast); mother sleeping with the baby, to encourage frequent night feeding; feeding on demand; non-use of pacifiers; expression of milk for maternal absences; and giving the breast before supplements. Messages would ideally be tailored to local knowledge, attitudes and practices regarding breastfeeding and birthspacing.

- give proper contraceptive advice to lactating women. The fertility-regulating role of lactation represents a sound basis on which family planning programs can be introduced and built. Counseling should be based on local information about

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a. The question of exact appropriate timing from a nutrition point of view is still open, though most pediatric groups recommend the 4-6 month range. There is evidence that if supplements are introduced too early, the increased risk of infectious diarrhea from unhygienically prepared foods can outweigh the benefits of extra energy and nutrients. Most evidence suggests that supplementation before 2-3 months or later than 6 months has more costs than benefits for the underprivileged infant. Growth faltering (indicating a need to supplement) can best be detected by regular weighing.
breastfeeding practices and the associated risk of pregnancy (11). All methods of
fertility regulation have somewhat different advantages and disadvantages when
offered to the nursing mother, as opposed to women experiencing regular menstru-
ation (see Annex 9). For example, those oral contraceptives with both estrogen and
progestin are not considered optimal for women who are breastfeeding, since
estrogen can inhibit milk production. The long-term effects on the infant of steroids
in injectables and implants are not known. On the other hand, barrier methods and
intrauterine devices do not interfere with lactation or infant growth.

Providers of family planning services in developing countries should be aware that
they may be giving advice to as many, or more, women in lactational amenorrhea as they
are to women ovulating regularly (68). WHO guidelines recommend that the duration
of lactational amenorrhea should determine what type of family planning strategy should be
employed and what contraceptive methods should be recommended. Breastfeeding and
contraception should act as complements, and maternal and child health services should
be closely coordinated with family planning services so that:

- successful breastfeeding and its contraceptive effect are not unintentionally inter-
  rupted; and
- appropriate modern contraception is available when recommended and desired.

This timing will vary across communities.

The IPPF (1987) recommends that women be informed that: it is difficult to predict
precisely the duration of lactational infertility of each woman; amenorrhea is associated
with a high degree of protection against pregnancy in fully nursing women; breastfeeding
on demand with a high frequency of nursing episodes through the day and night can defer
the onset of fertility; the risk of pregnancy increases with the first postpartum menses and
the introduction of supplementary milk or food to the infant; supplements, and particu-
larly bottlefeeding, should not be routinely recommended during the first six months
postpartum unless there is earlier indication of inadequate infant growth; and contracep-
tive measures should be recommended as soon as any of the risk factors mentioned is
present, or earlier if local experience suggests that this may be necessary.

World Bank projects can work toward the above objectives through breastfeeding
promotion actions in five complementary areas:

a. Provide for the collection and analysis of data on breastfeeding patterns and deter-
minants as part of other survey efforts. Information on community patterns of breastfeed-
ing incidence, duration, types of practices and resumption of menses are essential in
planning appropriate support activities, tailoring educational messages to local conditions,
determining when to introduce modern contraceptives and deciding which contraceptives
are most compatible with local circumstances. Information on the determinants of
breastfeeding helps clarify why women and households opt for particular infant feeding
practices and helps identify barriers to breastfeeding. Baseline data collection is also
necessary for measuring change and evaluating program efforts.

b. Train health and family planning workers. Health and family planning personnel
can help fill the gap brought about by the weakening of traditional support networks.
Without specific training, these workers are not likely to possess the knowledge to teach
families about breastfeeding. A survey of 1,300 Filipino health professionals, for example,
revealed that their generally positive attitudes toward breastfeeding were frequently dif-
ficult to put into practice because of inadequate knowledge of human lactation. In partic-
ular, they judged incorrectly when breastfeeding should not be continued and often prematurely recommended supplementation (69). The Population Council study has recommended that the health services themselves should be a principal target for breastfeeding promotion, noting that in some cases physicians display a particularly serious lack of information on this subject. Training is needed on the contraceptive effect of breastfeeding and how to enhance it, the timing of introduction of contraceptives, and the need to support mothers in beginning lactation and dealing with any problems. In a breastfeeding promotion project in Bangkok, for example, the training of staff was key to changes in hospital practices that had beneficial effects on breastfeeding (70).a

c. Include breastfeeding promotion and counseling in prenatal and child welfare visits. In face-to-face encounters during clinic visits, service providers can counteract forces that discourage breastfeeding and, by encouraging the development of local support groups, increase the range and effectiveness of the health system. Studies confirm that mothers afforded reliable information from health workers are more likely to initiate and continue breastfeeding (71;12). In the Proalma Project in Honduras, for example, which trained health workers in breastfeeding, the proportion of women who received information on infant feeding during prenatal visits increased from less than one percent in 1982 to 30 percent in 1985 (34).

d. Conduct mass media campaigns. Radio, television and print campaigns can be effective in promoting breastfeeding, particularly if conducted in tandem with other supportive measures, such as training and changes in hospital practices. Because breastfeeding declines tend to be greater in urban areas, promotive efforts targeted to the younger, more educated urban women who are the trendsetters may be a useful strategy. Successful campaigns have taken place in Trinidad & Tobago and Sweden, as well as in Bank-assisted projects in Colombia and Jamaica, among other places. Research in the Bank-assisted Brazil nutrition project helped pave the way for a national campaign, supported by UNICEF, that featured mass media.

e. Promote appropriate construction and establish supportive maternity policies (see Annex 4). The physical plant of hospitals and other delivery facilities can promote breastfeeding by a design that allows rooming-in (baby sleeping with mother) rather than a separate nursery. Hospital routines should follow guidelines to promote breastfeeding. Hospital-based programs have been associated with increases in prevalence and duration of breastfeeding in the Philippines, Guatemala, Singapore and Brazil (36). In Costa Rica, changes in hospital practices concerning breastfeeding were shown to have a dramatic impact on neonatal diarrhea morbidity and mortality (72). In one hospital in the Philippines where practices were modified to encourage breastfeeding, incidence of diarrhea among neo-nates declined by 94 percent over a four-year period, while mortality due to

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a. Institutional resources are available to aid in the development of training programs and other promotion activities. The San Diego Lactation Program (University of California San Diego Medical Center) trains health care providers (physician-nurse teams) who then set up lactation programs in their home hospital that encompass both teaching activities and changes in hospital practices. Models of training curricula and breastfeeding promotion materials from many countries are available from the Clearinghouse on Infant Feeding and Maternal Nutrition (American Public Health Association, Washington, D.C.). The Clearinghouse also publishes a newsletter on this topic, "Mothers and Children," and can refer consultants to help design breastfeeding programs. Both are AID-financed projects to support breastfeeding programs in developing countries (see Annex 9).
diarrheal disease fell from 8.05 per 1,000 to zero (73). Reductions in neonatal mortality and morbidity were also found in a hospital in Indonesia, in conjunction with a rooming-in program (34). In the Proalma Project in Honduras, changes in hospital practices and training of health professionals helped extend the average duration of breastfeeding from 5 months to one year and delay supplementation, which had begun as early as two weeks after birth (74).

f. **Encourage supportive policies at the national level.** Labor policy can support mothers in the workforce through provisions regarding maternity leave, nursing breaks and worksite creches. In countries where no legislation or regulations exist on the marketing of breastmilk substitutes, guidelines can be offered and formal steps encouraged.

A multifaceted approach that encompasses these six areas was tried in Brazil. The national breastfeeding promotion program there, begun in 1981, featured mass media (much provided at no charge by the private sector), training of 30,000 health workers, collection of baseline data, changes in hospital practices, education on breastfeeding in the primary and secondary school curricula, and legislative initiatives on breastfeeding and women in the work place. While a full-scale evaluation has not been undertaken, important increases in both incidence and duration of breastfeeding have been noted in many areas (75). A comparison of two studies in Sao Paulo over a ten-year period—the later survey conducted four years after the campaign had begun—reveals a substantial increase in both the frequency and duration of breastfeeding at all income levels, but most marked among women of higher income and educational levels (76). That this occurred in Sao Paulo, a highly industrialized city of over 10 million inhabitants, challenges assumptions that breastfeeding declines are inevitable or irreversible with urbanization.

**IN SHORT,** breastfeeding is a major determinant of fertility, and program actions are available to enhance its benefits for birth spacing, as well as for infant nutrition and health. Declines in breastfeeding that are harmful to these same goals will most certainly occur in the absence of active promotive measures. Barriers to breastfeeding have historically arisen with westernization. Promoting breastfeeding while countries undergo change will allow women to retain valuable traditional practices while adopting important western ones, such as modern forms of contraception, institutionalized births and employment outside the home. Promoting breastfeeding will also contribute to the effectiveness of family planning programs and allow those programs to work in concert with health and nutrition efforts. Projects with fertility limitation goals should therefore include breastfeeding promotion programs as complements to other services.
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ANNEX 1

Breastfeeding Promotion in World Bank Projects

A desk review of the sixty-eight past and ongoing projects of the World Bank in population, health and/or nutrition (through calendar year 1987) identified some type of breastfeeding promotion activity in twenty-five projects (37 percent). In descending order of frequency, they are:

<table>
<thead>
<tr>
<th>Activity</th>
<th>No. of projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding promotion as part of general nutrition education</td>
<td>15</td>
</tr>
<tr>
<td>Intensive educational campaigns</td>
<td>10</td>
</tr>
<tr>
<td>Counseling on lactation management</td>
<td>8</td>
</tr>
<tr>
<td>Training of health/family planning/nutrition workers in breastfeeding</td>
<td>5</td>
</tr>
<tr>
<td>Breastfeeding promotion for birth spacing</td>
<td>4</td>
</tr>
<tr>
<td>Data collection</td>
<td>4</td>
</tr>
<tr>
<td>Promotive hospital practices</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description of activities.** The most numerous category is general nutrition or health education, in which breastfeeding promotion figured among priority topics. In most projects, this referred to interpersonal education on the advantages of breastfeeding, based at the health center or in the community and designated as the responsibility of a specific category of personnel. In other cases no specific information was given on how breastfeeding was to be promoted, but it appeared to be part of general patient education. This first category, then, also functioned as a residual category, contributing to its higher frequency.

Among the more specific activities detailed, intensive mass media educational campaigns aimed at the public were the most common, taking place in ten projects. While all ten projects utilized print media, television was also used in Jordan, PDRY, Colombia, Jamaica and Oman, and radio was a vehicle in Lesotho, as well as in Colombia, Jamaica and Oman. Two of the largest campaigns were in early projects: Colombia I (Nutrition) and Jamaica II (Population).

In Colombia, a mass media campaign aimed at health center physicians as well as families was conducted via radio, video and print channels. The target group of mothers
with children under five years of age showed a significant change in attitude toward breastfeeding over the nine-month campaign. In addition to educational messages, the campaign sponsored and achieved the regulation, labeling, advertising and promotion of baby food. Infants under six months of age could not be pictured in the promotion of breastmilk substitutes, and free samples of infant formula to mothers in hospitals were banned.

In Jamaica, a national nutrition education and communication program promoted breastfeeding and infant and young child nutrition via radio, television and printed material. The campaign encompassed seminars for opinion leaders, doctors and paramedical staff; a marketing campaign to the public; and face to face communication via government field workers. The contraceptive effect of breastfeeding was explicitly recognized. Health center data indicated universal coverage of mothers regarding dissemination of nutrition messages.

About one-third of projects with breastfeeding activities have featured counseling of mothers on lactation management (i.e., how to deal with problems that arise during breastfeeding), an area that research has identified as critical to successful breastfeeding. In Colombia, auxiliary nurses and health promoters supported lactating mothers during the postpartum period. In Jordan, health care personnel, including midwives, have counseled mothers, both at the health center and in the home. Brazil II used nurses and paraprofessionals for this task, while Pakistan I has used dais (TBAs) and family welfare workers. Midwives and extensionists were used in Jamaica II and Brazil I (N), respectively, and in Indonesia I (P) this activity was the responsibility of the front-line MCH worker. Brazil III will counsel mothers on how to reduce problems in breastfeeding and control risk factors in lactation.

Only five projects (Burundi I (P&H), Jordan I (H), Brazil II (H), PDRY I (H) and Jamaica II (P)) have contained specific provisions for training personnel in breastfeeding counseling. Four projects (Pakistan I (P), Jamaica II (P), India I (P) and Brazil (III (H)) have explicitly recognized the value of breastfeeding for birth spacing.

Similarly, only four projects have made specific provision for data collection regarding breastfeeding prevalence, duration or practices. Again, the Jamaica II project stands out in this regard, along with the nutrition projects in Brazil and Colombia, and the health project in Northeast Brazil. The nutrition project in Brazil sponsored a study on the use of commercial infant formula that helped lay the basis for the government's subsequent national breastfeeding campaign, supported by UNICEF.

One project (Jamaica I) called for civil works that facilitated breastfeeding, i.e., provision for rooming-in in hospital design. This objective was not, however, the explicit reason for the innovation; savings in physical plant and staff requirements were cited as the rationale.

The project with the greatest number of activities has been Jamaica II, with six. Three projects, (Brazil III, Jordan I and Pakistan I) have featured four of the types of activities identified, while two (Brazil II and the nutrition project in Brazil) have featured three activities. Five projects have had two activities and fourteen projects have had one.

The geographic representation of the twenty-five projects breaks down as follows: ten (40 percent) in Asia, seven (28 percent) in Latin America and the Caribbean, five (20 percent) in Sub-Saharan Africa and three (12 percent) in the Eastern Mediterranean/North Africa.
The breakdown by type of project reveals that all (four of four) nutrition projects and the one health and nutrition project have had breastfeeding promotion activities. The corresponding figures for other projects are eleven of thirty-eight projects (29 percent) of those in population, population and health, or population, health and nutrition, and nine of twenty-five (36 percent) of those in health.

Breastfeeding promotion is clearly not without precedent in PHN projects. Some of the most active projects in this regard have been early ones, most notably Jamaica II. But a few more recent projects, such as those in Pakistan and Jordan, also appear to feature strong breastfeeding promotion components.

Though the record shows that projects with fertility reduction objectives have promoted breastfeeding to some extent, there is considerable scope for extending and expanding these types of activities in future projects. Over 63 percent of projects (forty-three of sixty-eight) have not featured any type of breastfeeding promotion, and of the twenty-five that have done so, only a handful stand out as particularly active in this regard.

Well under one-third of population projects have promoted breastfeeding, and only slightly over one-third of those in health. Geographically, Sub-Saharan Africa and the Near East, two areas that have presented particular challenges to adoption of contraception, are those in which breastfeeding promotion has been least frequent. They are also the areas in which breastfeeding is currently providing the strongest contraceptive effect, thereby meriting protection as health systems expand, institutionalized deliveries are encouraged and families are exposed more to exogenous influences. In Asia and Latin America, breastfeeding merits promotion, as throughout the world, in the rapidly urbanizing centers that have become almost synonymous with declines in duration and, to a lesser extent, incidence of breastfeeding.

All categories of activities bear strengthening in frequency across projects. Even the most common activity, that of nutrition education, has been present in only 22 percent of projects. Further, the most frequent types of activities, though representing important promotive activities, are likely to meet with limited success by themselves in preventing or reversing declines in breastfeeding. They need to be accompanied by promotive attitudes and practices on the part of knowledgeable service deliverers and appropriate practices in hospitals.

If breastfeeding is to be promoted in a way that enhances its contraceptive effect, it is essential that health system policies, programs and personnel support the type of breastfeeding that will delay ovulation, while taking into account infant health needs. Yet the record on breastfeeding promotion in PHN projects (in training service deliverers, facilitating appropriate hospital practices and counseling in lactation management) does not appear to be strong in this regard.

Another area of weakness is data collection. Information on community practices in breastfeeding is fundamental to the design of appropriate strategies for maximizing the contraceptive effect, as well as for evaluating the effects of program actions. Yet few projects appear to provide for collection of the necessary data on breastfeeding prevalence, duration, and practices, as well as resumption of menses, that would allow formulation of an appropriate strategy and detection of trends over time.
Description of Project Activities to Promote Breastfeeding

Project

1. Burundi I (P&H): Promotion of breastfeeding, among other topics, is included in the IEC component. Field staff training in nutrition activities for women and children, includes training in breastfeeding.

2. Jamaica III (P&H): Promotion of breastfeeding has been part of the government nutrition strategy since 1974, the chief vehicles being nutrition education and IEC activities. The breastfeeding activities begun under Jamaica II are continuing under a USAID-funded project. IEC under this project is geared toward family planning.

3. Oman I (H): High infant mortality has been linked to a decline in breastfeeding, among other contributing factors. Breastfeeding promotion is an area of focus of the 1986-1991 national campaign on child health sponsored by the government, WHO and UNICEF. Though not part of the Bank-assisted project, the objective is to raise awareness among women of the benefits of breastfeeding. Breastfeeding is also one of the five principal concerns of the IEC component under this project.

4. Brazil III (H): One objective is to raise the median duration of breastfeeding to six months. The contraceptive effect of such a rise is noted along with nutrition and health benefits. Present average durations range between one and three months. The comprehensive care program for women and children aims at reducing problems in breastfeeding and controlling risk factors during pregnancy and lactation.

5. Ghana I (H): The project includes support to government health centers and stations for activities in breastfeeding.

6. Colombia I (H): Project supports postpartum promotion of breastfeeding by auxiliary nurses and health promoters in health centers, health posts and homes.

7. Indonesia II (N & CH): Promotion of breastfeeding and birthspacing included in IEC component as well as messages linking breastfeeding and child nutrition.

8. Ivory Coast I (H): Health center personnel provide advice to mothers on breastfeeding, weaning, birth spacing and nutrition. An educational campaign on breastfeeding and weaning was under way during the time the project was designed.

9. India IV (P): Nutrition education activities focus on breastfeeding and adequate supplementary feeding.

10. Jordan I (H): Family physicians, graduate and practical nurses, and health education personnel receive both preservice and inservice training in breastfeeding, which is then promoted through health education at the health center level and through periodic mass media campaigns (print and television). Counseling on lactation management is provided by health care personnel, including midwives, during both health center and home visits.

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1 This project has been included in this list because of the ongoing breastfeeding promotion activities in Jamaica; discounting this project, the total number of Bank-supported projects with breastfeeding promotion activities is 25.
11. Lesotho I (P & H): IEC activities includes a promotional campaign on breastfeeding and weaning practices, via pamphlets, posters, manuals for staff and radio.

12. Nigeria I (H): Training of 300 Community Health Assistants and Aides to be posted at clinics, includes how to advise mothers on breastfeeding.

13. Brazil II (H): Promotion of breastfeeding is part of counseling via the health service. Nurses, auxiliaries and attendants receive training, and a booklet has been prepared for use in training. Brochures are available for literate mothers.

14. India III (P): Promotion of breastfeeding and adequate complementary feeding is included in IEC activities.

15. People’s Democratic Republic of Yemen I (H): Midwives and nurses receive training in breastfeeding, and breastfeeding is promoted through the health education program, including mass media (TV messages and posters).

16. Pakistan I (P): Within the IEC component, breastfeeding is one of the six population themes for the general public. Among the principal messages for pregnant and lactating women are breastfeeding and birthspacing to ensure healthy toddlers and mothers. Routine antenatal care includes health education on care of the breasts, breastfeeding and the advantages of family spacing. Among the postnatal care responsibilities of dais and family welfare workers are establishment and management of lactation. Among the tasks of the Family Welfare Center community volunteers is to encourage, in collaboration with dais, women to space childbearing with breastfeeding and contraceptives.

17. India I (N): Printed IEC materials enforce the message of continuation of breastfeeding and increased home feeding of children who receive nutrition supplements through government programs. Another message is the introduction of low-cost, locally available semisolid foods from the age of four months, with parallel continuation of breastfeeding.

18. Philippines II (P): One objective of the IEC program was to address the decline in breastfeeding.


20. Colombia I (N): A nine-month mass media campaign, aimed at health center physicians as well as families, was conducted during 1979-80. Radio, video and print channels were used. Evaluation showed a significant change in attitude toward breastfeeding among women with children under five years of age. In addition to educational messages, the campaign sponsored and achieved regulation of baby food labeling, advertising and promotion. It also included a legal ban on the use or mention of infants under six months of age in mass communication, on product labels or in promotional literature of any kind. Giving free samples of baby foods to mothers in hospitals was also banned, and other standards were issued for health institutions to follow.

21. Jamaica II (P): National nutrition education and communication program promoted breastfeeding and improved infant and young child nutrition via radio, television and printed material. Campaign comprised three thrusts: seminars for opinion leaders, doctors and paramedical staff; marketing campaign to public; and face to face communication via government field workers. Materials design was based on
a KAP study. Midwives charged with encouraging mothers to breastfeed, and the contraceptive effect of breastfeeding was explicitly recognized. The project supported equipment, vehicles and technical assistance for national and local campaigns, training, production of audiovisual aids, research and evaluation. One film was produced, as well as slides, media spots and printed material. A baseline study and mid-term evaluation were conducted. Though a final evaluation was not completed, health center data indicated universal coverage of mothers regarding dissemination of nutrition messages.

22. Indonesia I (N): Promotion of breastfeeding and weaning foods was included in the IEC component.

23. Brazil I (N): An explicit project objective was to provide nutrition education to promote an extended duration of breastfeeding — to at least three months and preferably six. Rural extensionists and social extensionists targeted efforts to selected farm families, landless poor and tenants. Findings from a project-sponsored study on the use of commercial infant formula had impact beyond Brazil. This contributed to the government’s subsequent national breastfeeding campaign, to which UNICEF contributed financial and technical support.

24. Indonesia I (P): Among the responsibilities of the front-line MCH worker was education regarding traditional and modern methods of contraception, care of the breasts and establishment of breastfeeding and artificial feeding.

25. India I (P): Potential effects of better nutrition in increasing nursing capacity and duration of lactation, thus prolonging the interval between births was explicitly recognized in project activities.

26. Jamaica I (P): Construction of a new hospital maternity wing was designed to allow infants to sleep in alongside their mother’s bed (i.e., rooming in), though reasons cited for this did not include breastfeeding promotion.

Key:  
CH: Community Health  
H: Health  
N: Nutrition  
P: Population
Selected Findings from WHO Collaborative Study on Breastfeeding

Countries Studied: Chile, Ethiopia, Guatemala, Hungary, India, Nigeria, Philippines, Sweden and Zaire.

- Breastfeeding is accompanied by a delay in the return of postpartum menstruation.
- Among non-breastfeeding women, 80-100 percent were menstruating by 3-4 months postpartum.
- Among breastfeeding women, from one percent (India) to 57 percent (among urban elite in Ethiopia) were menstruating by 3-4 months postpartum.
- The mothers experiencing longest postpartum amenorrhea were those who breastfed on demand, fully and of long duration.
- Up to 10 percent of the women interviewed appeared to have conceived without menstruating.
- The data suggest that hospital practices are influenced by the attitudes of individual doctors and nurses, as well as by overall policy. Such practices as rooming in and early initiation of breastfeeding appear to have a bearing on breastfeeding patterns.
- It was uncommon for mothers to say that they had stopped breastfeeding specifically because of a need to return to work.
- Where the level of advertising of infant formula or the distribution of free samples was high, the prevalence of breastfeeding was low.
- The highest infant death rates were in groups with the highest prevalence and longest duration of breastfeeding, presumably because both factors were correlated with poor socioeconomic conditions. This relationship carries with it a warning of the further threat, in terms of both increased fertility and higher infant mortality, that a decline in breastfeeding would pose under similar conditions.
- Although in some prenatal, maternity and postnatal services a point is made of promoting breastfeeding, there is in general a marked lack of specific health policies in this respect.
- In Hungary and Sweden, where promotive information on breastfeeding is provided as a regular part of prenatal care, the proportion of mothers initiating breastfeeding was higher than in the urban populations of some developing countries. Breastfeeding was least frequently established among urban, economically advantaged groups in developing countries, in whose maternity clinics little or no
attempt was made to provide regular instruction on breastfeeding or to encourage it at all.

- The groups with the lowest pregnancy rates were those in which prolonged breastfeeding is almost universal. Contraceptive use was low in these groups.
- In groups in which more than 10 percent of women were using contraception, the percent with long birth intervals is lower than in those in which the majority of mothers breastfed for at least 18 months.

Breastfeeding is associated with a considerable delay in return of menstruation, but the differences between breastfeeding and non-breastfeeding mothers gradually diminish or disappear with time.

- 85 percent of total variability between countries and groups in respect of return of menstruation can be attributed to differences in breastfeeding behavior.
- Data suggest that menstruation tends to return sooner when there is partial breastfeeding than when there is full breastfeeding.
- The percentages of women in whom menstruation had returned were consistently high, irrespective of postpartum interval, among the women who suckled least frequently.
Percentage of breast-feeding women with return of menstruation, by age of child and frequency of suckling, Guatemala and Hungary*

<table>
<thead>
<tr>
<th>Country</th>
<th>Frequency of suckling by day</th>
<th>Age of child (months)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1-4</td>
<td>5-8</td>
<td>9-12</td>
<td></td>
</tr>
<tr>
<td>Guatemala</td>
<td>up to 4 times</td>
<td>22 (59)</td>
<td>42 (53)</td>
<td>53 (74)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 times or more</td>
<td>11 (115)</td>
<td>23 (124)</td>
<td>36 (90)</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>up to 4 times</td>
<td>49 (306)</td>
<td>68 (435)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 times or more</td>
<td>26 (1,006)</td>
<td>51 (79)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Figures in parentheses indicate numbers of breast-feeding women interviewed

** By day means during mother's waking hours

† Urban poor (C) and rural (R) groups

PERCENTAGE OF WOMEN PREGNANT, BY BREAST-FEEDING STATUS, 12-17 MONTHS POST PARTUM*

(A) Economically advantaged  (C) Urban poor  (R) Rural

Breast-feeding  Not breast-feeding

* Groups in which more than 10% of mothers reported using contraceptives have been excluded

ANNEX 3

Major Variables Likely to Have a Direct or Indirect Effect on the Duration of Lactational Amenorrhoea

I. DIRECT

(a) Sucking time per bout
(b) Sucking time per day
(c) Sucking intensity
(d) Sucking frequency
(e) Average interbout length of time
(f) Longest interbout period
(g) Mother’s nutritional status

II. INDIRECT

(a) Age of introduction of supplements
(b) Duration of breastfeeding
(c) Quantity of supplements introduced
(d) Method of feeding (spoon or bottle)
(e) Use of pacifier (dummy)
(f) Demand vs. scheduled feeding
(g) Intensity and duration of mother-infant contact
(h) Night feeding (sleeping with baby)
(i) Maternal dietary supplementation

Source: Greiner, 1985.
ANNEX 4

Guidelines for Health Planners and Practitioners in Promoting Breastfeeding Through Maternity and Clinic Routines

Guidelines for Hospital Policy
1. Avoid unnecessary drugs or surgery during delivery.
2. Commence breastfeeding soon after delivery.
3. Avoid separation, by rooming the child with the mother.
4. Encourage frequent on-demand breastfeeding.
5. Discouragement of bottlefeeding in health care institutions except on clear medical indication.
6. If necessary, provide nutritious foods for babies who are, for medical reasons, unable to breastfeed.

Guidelines for Clinic Policy
1. Provide advice on dietary needs during pregnancy and lactation.
2. Provide prenatal care and food supplements for malnourished pregnant women.
3. Provide guidance for mothers and their families on the value, management and maintenance of lactation.
4. Provide contraceptive methods that do not interfere with breastfeeding.
5. Provide postnatal support through home visits, clinics and other means.
ANNEX 5

Counseling Families Regarding Breastfeeding and Birth Spacing

1. Determine which of the following groups they fall under:

(a)- Not interested in birth spacing  
(b)- Interested in birth spacing, not in contraception  
(c)- Interested in contraception, not now using it  
(d)- Using modern contraceptive method

2. Counsel family accordingly:

(a)- Dangers of close birth spacing for mother and child health
- Economic burden and maternal time constraints caused by several young children
(b)- How to use breastfeeding effectively to space babies
- Complementary measures; determining return of ovulation
(c)- Determine past and planned infant feeding pattern
- Advise regarding breastfeeding for birth spacing
(d)- Advise on breastfeeding for child health and survival
- Need to delay pill
- Advise when contraceptive likely to be needed
- Advise when to initiate contraception among breastfeeding mothers; at menses or at time when 25-50% resume it
- Advise on other options available

Source: Greiner, 1985.
ANNEX 6
Guidelines for Contraceptive Use for Breastfeeding Women in the USA

Simplified Decision Tree for Introduction of Contraception in Majority of Women During Lactation

Menses resumed

Yes

No

Supplements daily or sleeps through the night

Yes

No

Woman at low risk of pregnancy but may wish to use a barrier method or IUD

Woman may begin to take oral contraceptives (Low dose)

ANNEX 7

Birth Interval Influences on Child Mortality

ANNEX 8

Resources


Inservice Course in Lactation and Breastfeeding Management for Health Professionals. Audrey J. Naylor, M.D., Wellstart/San Diego Lactation Program, P.O. Box 87549, San Diego, California 92138. Trains physician-nurse teams to undertake hospital-based breastfeeding promotion programs.
METHODS OF CONTRACEPTION
DURING LACTATION

A. Nonhormonal Methods

1. Spermicides (jellies, creams, foams, foaming tablets, foaming suppositories, melting suppositories)

a) effect on lactation:
- No adverse effect on duration of lactation, milk volume or composition.
- Reports from animal studies suggest that nonoxynol-9 is absorbed systemically by mother rats and may be transferred via milk to the offspring.
- No reports of systemic absorption in human trials.
- No adverse effects reported.

b) effect on infant:
- None.
- Does not require a prescription.
- Offers some protection against sexually transmitted diseases (including AIDS).
- Intermits lovemaking—may decrease sexual pleasure.
- Failure rate higher than pill, IUD or sterilization.
- Allergy to latex or lubricants in condom may cause local irritation.

f) comments:
- To improve its effectiveness as a contraceptive method, the diaphragm should be used in conjunction with spermicidal foam, cream or jelly. This may be perceived as an additional disadvantage.

2. Condoms

a) effect on lactation:
- None.

b) effect on infant:
- None.

c) suggested time to begin:
- Any time postpartum.

d) advantages:
- Easy to use.
- Effective.
- Inexpensive.

f) comments:
- The diaphragm is reliable if used conscientiously and properly. It requires proper fitting and adequate client instruction to increase its rate of effectiveness.

3. Diaphragm

a) effect on lactation:
- None.

b) effect on infant:
- None.

c) suggested time to begin:
- 4 to 6 weeks postpartum.

d) advantages:
- No dangerous side effects.
- Can be inserted well in advance of sexual activity.
- Appears to protect against certain sexually transmitted diseases and cervical cancer.

f) comments:
- The diaphragm is reliable if used conscientiously and properly. It requires proper fitting and adequate client instruction to increase its rate of effectiveness.

4. Vaginal Contraceptive Sponge (Today)

a) effect on lactation:
- None.

b) effect on infant:
- None.

c) suggested time to begin:
- 4 to 6 weeks postpartum.

d) advantages:
- Continuous protection for 24 hours regardless of frequency of coitus.
- Not as messy as spermicides used with or without the diaphragm.
- Easy to insert.
- May protect against certain sexually transmitted diseases.
- Can be purchased without prescription.

f) comments:
- The diaphragm is reliable if used conscientiously and properly. It requires proper fitting and adequate client instruction to increase its rate of effectiveness.

really need a larger diaphragm sponge to assure a snug fit in vagina.)
-Greater risk of pregnancy in parous married sponge users (24.2%) than diaphragm users (6.2%).
-Cannot be used during menstruation or immediately after a birth or abortion.
-Because the sponge is new, it is unknown whether there is a relationship between its use and toxic shock syndrome. To minimize this risk, the sponge should not be left in the vagina longer than 24 hours.
f) comments:

6. Intrauterine Device
a) effect on lactation:
Amount and chemical composition of milk do not differ from controls in users of inert IUDs and copper-releasing devices.
-Progestasert (system-containing progestin) stimulates the amount and increased milk yield significantly.
-No significant differences in mean durations of breastfeeding between copper releasing and levonorgestrel releasing devices.

b) effect on infant:
-No adverse effects reported on infant growth and development.
-


c) suggested time to begin:
-Immediately or 6 weeks postpartum.
-

d) advantages:
-Postpartum insertion of an IUD within 10-30 minutes of placental expulsion poses no threat to lactation and is associated with lower expulsion rates than insertion during the first 1 or 2 days postpartum.
-Effective contraception which does not interfere with lactation and poses no threat to the nursing infant.
-High use effectiveness because continuing user motivation and action are not needed.
-Failure rates for IUDs are usually less than 5%.
-Easily reversible (see comments).
-

e) disadvantages:
-Perforation risk may be slightly greater when IUDs are inserted in breastfeeding women, but there is no increased risk if it is inserted after placental expulsion. (See comments.)
-Increased bleeding or spotting (less of a problem during lactation).
-Cramping and pain.
-Especially in women with multiple sex partners, increased risk of STDs, PID, ectopic pregnancy.
-Progestasert IUD must be replaced after one year.
-Nonmedicated devices difficult to obtain in U.S. through 1987. (See comments.)
-Attention needs to be focused on identifying suitable candidates for IUDs. Women who want reversible contraception to space births or limit family size are good candidates especially if they:
-are parous;
-are breastfeeding;
-smoke cigarettes;
-cannot use other contraceptives; or
-are in stable monogamous relationships.
-Careful assessment of uterine size may reduce the risk of perforation since the uterus may be smaller than expected during lactation.

In 1988, a Copper T device will be available again in the U.S. markets.

B. Hormonal Methods

1. Combined Oral Contraceptives

(Endeone-Progestin)
a) effect on lactation:
-Moderate inhibitory effect.
-Reduced volume of breast milk.
-More infant supplementation.
-Shorter duration of breast feeding.
-No significant differences in concentrations of protein, fat and lactose in breast milk.
-Small quantities of steroid detectable in milk.
-

b) effect on infant:
-Possible slower weight gain.
-A few isolated reports of gynecomastia which gradually subsided after discontinuing use.
c) suggested time to begin:

- No long term effects reported on physical, intellectual or psychological behavior of infants and children up to 8 years.
- Hormonal methods, particularly combined orals, are not the methods of first choice during lactation. Do not prescribe earlier than 6 weeks postpartum. Generally, there is no need before that time in lactating women.
- Encourage use of other methods in second or third postpartum months if possible.
- Progestin-only pills are preferred to combined pills if oral contraceptives are chosen during lactation.
- In order to minimize the inhibitory effect of combined oral contraceptives on lactation, prescribe the lowest possible dose and advise women:
  a) to take each tablet daily at the beginning of the longest interval between breastfeeding (e.g. night feeding);
  b) to provide additional sucking time to counteract any hormonal effect in reducing milk supply;
  c) that persistence in nursing can restore milk supply even if OC initially diminishes milk quantity.

2. Progestin-only Contraceptives ("Mini-pill") (Micronor, Nor-Q-D)
   a) effect on lactation:
      - No effect on volume of breastmilk, or may produce a small increase.
      - No effect on duration of breastfeeding or slight increase.
      - Concentrations of protein, fat, lactose in breastmilk not significantly altered.
      - Small quantities of steroid detectable in milk.
   b) effect on infant:
      - No effect on infant weight gain.
      - No reported long term effects.
   c) suggested time to begin:
      - Not the method of first choice during lactation but may be given at the time of postpartum examination. As with combined pill, it is recommended to delay initiation until baby eating mixed diet, if possible.
   d) advantages:
      - Protection against pelvic inflammatory disease. (Current oral contraceptive users face about half the risk of non-contraceptors or one fourth the risk of IUD users.)
      - Protection against ectopic pregnancy (one tenth the risk of non-contraceptors).
      - Protection against endometrial cancer (women who use OCs for a year or more have one third the risk of developing uterine cancer).
      - Protection against ovarian cancer (two thirds the risk of never users).
      - Protection against benign breast disease (one half the risk of non-users).
      - Relief from a wide range of menstrual disorders including irregular menses, premenstrual tension, dysmenorrhea, and excess blood loss (which may lead to anemia).
   e) disadvantages:
      - Higher pregnancy rate (2-3 per 100 woman years) than combined preparations (less than 1 per 100 woman years) (may be of little consequence because of the lowered fertility already present due to lactation).
      - Irregular menses, amenorrhea (occurs less frequently among nursing women).
      - Associated with higher risk of ectopic pregnancy (again, less of a worry among lactating women).

C. Other Hormonal Methods Not Currently Available / Future Developments

1. Injectable Contraceptives (depot medroxy progesterone acetate, DMPA, Depo-Provera® and norethindrone enanthate NET-EN, Noristerat®)
   a) effect on lactation:
      - Significantly longer duration of breastfeeding.
Alterations in breastmilk composition have been reported: a significant increase in protein and a slight (but not significant) increase in the volume. A significant decrease in fat content has been observed.

- Steroid present in the milk; transfer greater than with mini-pill

b) effect on infant:
- No reported long term effects on growth and development of children to 10 years of age.
- Preliminary analysis of nearly 200 adolescents who were exposed to DMPA in utero found no evidence of retarded or precocious development or any disturbance in sexual development, sexual behavior or growth.

c) suggested time to begin:
- Not the method of first choice during lactation but may be started 6 weeks postpartum or later, if possible (as above).

2. NORPLANT® Implants

a) effect on lactation:
- No adverse effect on lactation.
- Small amount of steroid present in milk.

b) effect on infant:
- Rate of infant growth within the normal range.
- Serum levels of immunoglobulins and urinary levels of FSH, LH and testosterone are the same in breastfed infants of women using NORPLANT® and of women using barrier methods or no contraception. No long-term effects reported to date.

c) suggested time to begin:
- Not the method of first choice during lactation but may be inserted at 6 weeks postpartum visit. Data show no adverse effects when used as early as 1 month postdelivery but nonhormonal methods are first choice if possible.

d) advantages:
- Highly effective.
- Long duration of action — 5 years.
- Absence of estrogen and thus no estrogen side effects.
- Decreased menstrual blood loss. (Increased hemoglobin levels while using method.)
- High continuation rates (88.4-95.3% at one year).
- Releases progestin at a fairly constant low rate, avoiding initial high dose typical of injectables and the daily surge of hormones with oral contraceptives.

3. Vaginal Rings (containing natural hormone progesterone)

a) effect on lactation:
- No significant differences in duration of lactation between the progesterone and control groups of Copper T users.

b) effect on infant:
- No deleterious effects reported to date on infant growth or health.
- Further study of long-term effects is ongoing.

c) suggested time to begin:
- 2-3 months postpartum.

d) advantages:
- Woman can insert and remove it herself.
- Vaginal rings do not have to be inserted just before intercourse. They remain in the vagina for 3 months.

e) disadvantages:
- Women who dislike touching their genitals may not like inserting and removing the rings.
- It is less effective than other hormonal methods or voluntary sterilization but for lactating women, effectiveness is comparable to copper IUDs.

f) comments:
- The progesterone ring is designed especially for breastfeeding women so that they will not be exposed to synthetic hormones that might affect the composition or quantity of breastmilk. Progesterone is naturally present in mothers once they resume ovulation. The ring is designed to be worn continuously. It will not work if used only during intercourse. Removing the ring for a short period — as long as 2 hours — will not decrease its effectiveness. Leaving it out longer may increase the risk of pregnancy. Estimated availability — early 1990’s.

- Menstrual disturbances: Heavy bleeding is uncommon, but intermenstrual bleeding and amenorrhea after prolonged use occur in about half the users. (Less of a problem among nursing women.)
- Return of fertility is delayed 4 to 9 months after the last dose. Fertility returns eventually, however. The effect is less noted immediately postpartum.

- DMPA is not currently approved for contraceptive use by the USFDA.
D. "Natural Family Planning" Methods (NFP)

- **a) effect on lactation:** None.
- **b) effect on infant:** None.
- **c) suggested time to begin:** See disadvantages.
- **d) advantages:**
  - No known physical side effects.
  - Normal physiology is not interfered with.
  - Users develop an awareness of fertility which helps promote a more responsible attitude towards family planning.
  - Morally and culturally acceptable in any society where a period of abstinence is accepted and other methods of contraception are not.
- **e) disadvantages:**
  - Usual indicators are generally not useful in postpartum period:
    - Basal body temperature patterns are erratic in breastfeeding women and cannot be used to predict ovulation.
    - Mucus patterns vary among lactating women and do not always reflect hormonal activity.
  - Not possible to use method at all unless woman has used before pregnancy and, preferably, has noted physical changes during a previous postpartum period.
- **f) comments:**
  - Possibility of use of NFP in the postpartum period needs further evaluation.

E. Postpartum Sterilization

- **a) effect on lactation:** One study reported that women sterilized within 24 hours after delivery produced milk in quantities similar to the unsterilized controls. Women sterilized 4-6 days after delivery produced less milk for as long as 2 weeks postpartum.
- **b) effect on infant:** No reported adverse effects.
- **c) suggested time to begin:** See effect on lactation.
- **d) advantages:**
  - Immediate postpartum sterilization requires no additional hospitalization, and additional costs (if any) are minimal.
  - It is immediately effective.
  - Highly effective long-term contraception without need for continued motivation or positive action.
- **e) disadvantages:**
  - Carries a risk of operative mortality and morbidity.
  - Permanent; irreversible.
  - Sterilization is more complicated than alternative contraception and requires specialized skills and facilities.
- **f) comments:**
  - The adverse effect on lactation perhaps may occur because of anesthesia—i.e., sterilization takes place when milk production is beginning. If such an effect exists, it could be minimized by using regional or local anesthesia at the lowest effective level.
  - There is no evidence to suggest that breastfeeding need be interrupted because of anesthetic medication given to mother.
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