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**Influencing Breastfeeding in Developing Countries  
and Its Association With Fertility**

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## **Influencing Breastfeeding in Developing Countries**

Influences on fertility in developing countries can be categorized into factors that affect supply of children, demand for children and costs of fertility regulation (Easterlin, 1978). Supply of children is influenced both by levels of natural fertility (fertility in the absence of deliberate control of reproduction) and by child survival. Demand for children reflects the family size and composition that couples desire. Costs of fertility regulation include perceived benefits of family planning use and accessibility to contraception or induced abortion, influenced by availability of health services and cultural or religious attitudes to family planning (Bulatao and Lee, 1982).

In most developing countries exhibiting high birth rates, demand for surviving children approaches or exceeds that of supply, or children are not perceived in demand terms (Bongaarts and Menken, 1982). Under these conditions, fertility is primarily influenced by supply factors: natural fertility and child survival.

### NATURAL FERTILITY

Levels of natural fertility are affected by the duration of the reproductive span and the duration of the interval between births within that span. The length of the theoretical reproductive span (initiation and termination of childbearing) is demarcated by menarche and menopause, while the effective reproductive span is in actuality initiated by onset of cohabitation (which is usually associated with marriage, though pre-marital intercourse may

signal its initiation) and by the termination of childbearing prior to menopause at the opposite end of the span due to terminal abstinence or sterility.

### Initiation of Childbearing

Although Udry and Cliquet (1982) noted a fairly consistent association between the age at menarche, age at marriage, and age at first birth, the effect on total fertility of changing ages at menarche appears to be minimal (Bongaarts and Menken, 1978). Variations in the age at marriage, however, have been shown to have substantial effect on total fertility. Mauldin and Berelson (1978) observed that delayed marriage accounted for 35 to 40 percent of the fertility decline in ten developing countries that had major fertility decreases from 1962 to 1972. This effect is especially evident in Sri Lanka, Tunisia and Malaysia (Dusa and Baldwin, 1977).

Aside from the age at marriage, the prevalence of marriage (or proportion of women eventually marrying) also affects total fertility. Unlike historical European societies, however, where a later age at marriage was associated with a high proportion of women who never married, this trend appears not to be common in developing countries. Increases in the age at marriage in developing countries are associated with high proportions ever-marrying. Other nuptiality factors that affect the prevalence of marriage include the practice of polyandry, participation in consensual or free sexual unions, and the extent of marital dissolution. Although exceptions exist, all three factors are associated with lower fertility (Burch, 1982) and, in general have a smaller role in determining overall fertility than age at marriage.

### Termination of Childbearing

While the age at menopause may vary by nutritional status, its effect on fertility appears to be minimal, since the age at last birth in most populations varies little (average age - 40 years) and is significantly less than the estimated age at menopause (Gray, 1982). Termination of childbearing appears to be principally influenced by terminal abstinence (either due to widowhood or proscription of intercourse among grandmothers), or increases in sterility (Knodel, 1982; Bongaarts, 1982; Gray, 1982). Variations in these factors which affect the timing of end of childbearing, in contrast to its initiation, appear to have only a minimal effect on total fertility (Bongaarts, 1982; Gray, 1978; Knodel, 1982).

### Birth Interval Components

Fertility determinants within the interval between births include the period of postpartum infecundability (from pregnancy termination to onset of ovulation or to resumption of intercourse when postpartum abstinence extends past the first ovulation); waiting time to conception (from termination of postpartum infecundability to conception) and intrauterine mortality. Postpartum infecundability varies more than any other proximate determinant, from an average 2 months when breastfeeding is not practiced, to over 2 years in some populations studied when breastfeeding is practiced (Bongaarts, 1982; Page and Lesthaeghe, 1981).

The conception-wait interval averages between 5 to 10 months and is determined by frequency of intercourse, and biological characteristics including the proportion of cycles that are ovular, and the viability of the sperm. Spouse separation can have a major impact on the conception-wait interval (Potter

and Kobrin, 1982); however, only in certain populations such as those with high rates of male outmigration is this a major factor in determining fertility levels.

The risk of intrauterine mortality is about 20% after the first four weeks of gestation, with most deaths occurring early (less than 12 weeks) (Gray, 1982). Variations in intrauterine mortality, especially early fetal wastage, between populations appear to be minimal.

### CHILD SURVIVAL

Child mortality in most poor developing countries remains high, greatly exceeding the levels in the developed world. While the survival of children substantially influences total potential supply, we are concerned in this paper with factors that can promote reduced natural fertility without negatively affecting child survival. Chen (1982) has provided a framework illustrating factors which influence child survival including: parental factors (age, parity, birth interval, maternal nutritional status); nutritional variables (including diet and feeding variables); infections and infestations, and child care (including health care services). In our discussion of factors influencing natural fertility, we will be concerned with the potential impact of policies on child survival.

### INFLUENCE ON NATURAL FERTILITY

By varying the proximate determinants of fertility through their ranges while the other determinants are kept constant, the effect on total fertility rate (TFR) has been estimated by Bongaarts and Menken (1982). This sensitivity analysis illustrates that the largest variations in TFR are caused by changes in the age of marriage and in postpartum infecundability. Changes in the waiting time to conception, spontaneous intrauterine mortality and age of termination

of childbearing had, in general, only minor effects on TFR. Only in specific cases is natural fertility significantly altered on a population basis by other proximate determinants, such as with high rates of outmigration affecting waiting time to conception, or a high prevalence of venereal disease causing high rates of sterility.

It is important to keep in mind that the relevance of natural fertility is primarily in the early and transitional stages of modernization. Although the timing of fertility declines in relation to the development process has been debated in the literature (Knodel and van der Walle, 1978), development eventually brings about a decrease in demand for children and in the costs of fertility regulation. Modernization may cause an increase in fertility during its early stages when natural fertility and child survival are enhanced, but not yet offset by increases in family planning use (Easterlin, 1982).

The purpose of this paper is to discuss how breastfeeding can be maintained at this early stage of development, in order to delineate policies that will help to maintain or reduce natural fertility until appropriate, successful practice of contraception can be achieved. It is assumed that the influence of modernization will be operating in developing countries to some degree. Influences that could maintain or increase breastfeeding prevalence, but that are contrary to the development process, that are infeasible, or that are likely to have detrimental side effects will not be discussed. Only those influences that have been attempted or those that have a realistic potential to affect natural fertility will be examined.

### Postpartum Infecundability

Aside from the age at marriage, the major factor affecting natural fertility is postpartum infecundability. This is dependent upon the period of amenorrhea following childbirth to the onset of ovulation, or the period of postpartum abstinence following a birth among women whose abstinence is delayed beyond the onset of ovulation.

The principal factor affecting the duration of amenorrhea includes the incidence of breastfeeding, its duration and the type of suckling patterns associated with the breastfeeding. Postpartum abstinence only has an effect on fecundability when it extends beyond the duration of amenorrhea. In most populations in Southeast Asia and Latin America, abstinence seldom exceeds a few months and does not approach the duration of amenorrhea. In certain populations, however, such as in parts of Indonesia and Nigeria, abstinence appears to exceed the duration of amenorrhea while in others it is extended but often still shorter than amenorrhea or the duration of breastfeeding (Singarinbum and Manning, 1976; Rehan and Abashiya, 1981; Dow, 1977; Caldwell and Caldwell, 1981). The effect of abstinence on fertility appears to be significant only in a small proportion of communities. It also appears that the duration of abstinence is currently being eroded in most parts of the world with increasing modernization (Nag, 1982). Because of these two factors and because policies are unlikely to have substantial effects on the duration of abstinence, we will not consider influences on changes in postpartum abstinence in this discussion.

Easterlin (1982) hypothesized that during the initial stages of the demographic transition, slight increases in fertility may result from breastfeeding declines in the absence of increased usage of modern family

planning methods. Concern for the effect of decreases in the incidence and duration of breastfeeding on natural fertility is based not only on postulated associations, but also on documentation of increases in fertility noted with reductions in the prevalence of breastfeeding. Evidence for increases in fertility associated with declines in the incidence and/or duration of breastfeeding is suggested by studies conducted in Zaire, Canada, Alaska and Kenya, Malaysia, and Algeria (Romaniuk, 1980; Romaniuk, 1981; Blackwood, 1981; Lesthaeghe, 1982; Butz et al, 1981; Vallin, 1978).

In most countries the incidence and duration of breastfeeding are highly correlated; where there is a long duration the incidence is high. However, there are a few countries which are exceptions to this rule, including Jamaica and Brazil which have relatively high incidences but short durations of breastfeeding. (Lesthaeghe, 1982; Marin, 1982). We will discuss influences on these two factors together, since seldom are low incidences associated with extended durations, and the factors affecting the duration of breastfeeding are similar to those affecting the incidence of breastfeeding. Extended durations of breastfeeding are also associated with specific suckling patterns that positively influence the duration of amenorrhea. We will discuss factors affecting suckling patterns first, since it is through the mechanisms reducing suckling that incidence and duration are often affected.

#### Effects on Frequency, Intensity and Duration of Suckling

The physiologic process of breastmilk production and output is dependent on the suckling process, including its frequency, intensity and duration. We have a greater understanding of the importance of frequency than of the other two factors, both in terms of milk production and in maintenance of amenorrhea.

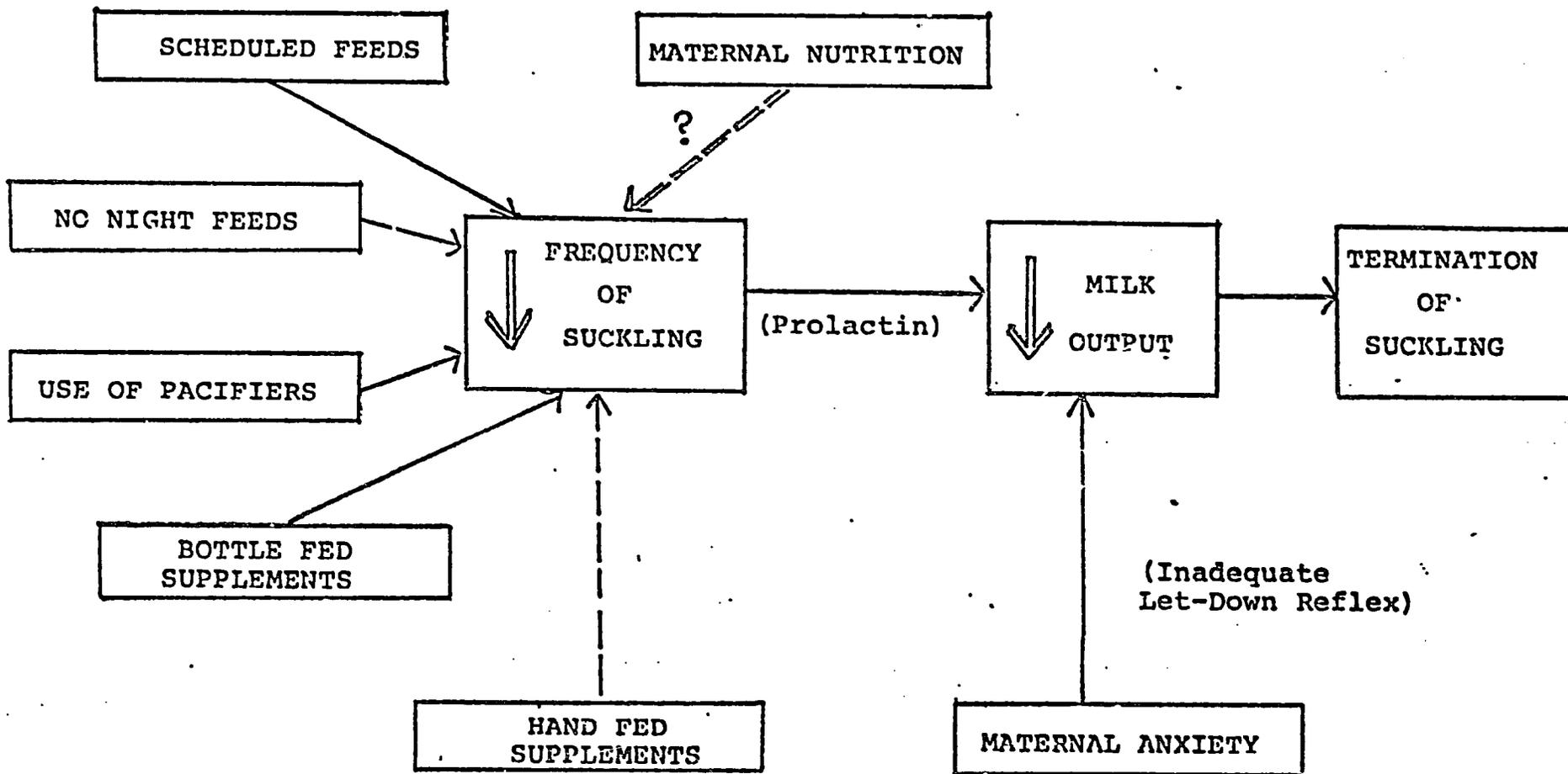
As the infant sucks at the breast, prolactin, and oxytocin are released. Prolactin is the hormone necessary for milk production and secretion and is also associated with the maintenance of the anovular state, but the mechanism is as yet not well understood (Delvoe and Robyn, 1980; McNeilly et al, 1980). Oxytocin is the hormone necessary for milk ejection from the breast (let down reflex). Its release can be inhibited or facilitated by psychological and emotional factors (Jelliffe and Jelliffe, 1982). Stress can block the release of oxytocin and prevent the let down reflex, causing a physiologic but not anatomic inability to breastfeed.

Figure 1 illustrates how decreases in suckling frequency affect lactation. Enhanced suckling and associated prolactin release lead directly to increased milk output. Factors that affect suckling frequency include the supplementation of the child's diet, practice of demand or scheduled feedings, night-time feedings and use of feeding bottles and pacifiers. A major factor that affects milk output is maternal anxiety or confidence, which can inhibit release of oxytocin and subsequently milk output. Low milk output can lead to termination of breastfeeding when it becomes so low that lactation can not be sustained. This appears not to be the case in association with malnutrition since even though milk output is reduced somewhat in malnutrition, malnourished women continue breastfeeding for extended durations (Whitehead, 1981).

Numerous studies have documented the association between supplementation of the child's diet and shortened duration of postpartum amenorrhea (Chen et al, 1974; Buchanan, 1975; Prema and Philips, 1980; Delgado et al, 1981, Prema and Ravindranath, 1982). The presumed effect is through a reduction in suckling associated with increased food supplements.

Figure 1

FACTORS DECREASING FREQUENCY OF SUCKLING



Comparisons are generally made between full and partial breastfeeding; however, the definitions of these patterns often vary. Partial supplementation varies by the type, amount, and caloric content of supplements, with corresponding differences in effects on suckling patterns. Even within groups of women who fully breastfeed (with similar definitions of "full" breastfeeding), or those supplementing with the same types and amounts of foods, suckling patterns may differ according to certain feeding practices: whether bottles are used, the frequency with which the child is fed at night, and whether the child is fed "on demand."

Prema and Ravindranath (1982) have illustrated in a study in Hyderabad, India that a high proportion of the association of duration of breastfeeding with length of amenorrhea is mediated through the length of time the infant is fully breastfed. This is because the length of full breastfeeding is highly correlated to the duration of total breastfeeding. An introduction of supplements at too early a date is detrimental both to enhancement of amenorrhea duration, and to the infant's health because of the increased risk of diarrhea due to contamination of food supplements, and use of inappropriate supplements (in terms of energy, protein, bulk and digestibility). Supplements should be postponed until the infant is about four to six months, except when inadequate growth is noted.

The use of bottles has a negative effect on suckling frequency at the breast. The frequency of nighttime breastfeedings is enhanced when the mother and child sleep together, since the child often suckles without waking the mother. Children fed "on demand" generally breastfeed more often than those fed at specified time intervals (on a schedule). The use of pacifiers is also associated with decreases in suckling, because non-nutritive suckling needs are in part met by the use of a pacifier, rather than being met at the breast.

Table 1 provides data from some studies that have compared suckling time, type of supplementation, and duration of amenorrhea. Also included in this table is information on other factors that will also affect suckling frequency, including whether the mother sleeps with the child, use of pacifiers, and demand/scheduled feeds.

Populations exhibiting early supplementation with substantial contributions in terms of nutrients (especially noted by the use of milk or formula) have shorter durations of amenorrhea (Hutterites, Iran, and Scotland); it should be noted that bottles are also used by these groups, and some also employ pacifiers, and reduced or no night feeding. In the Gambia, Zaire, and among the !Kung, where supplementation is begun early but only provides a small part of daily nutrient requirements, amenorrhea is extended. In Zaire, the frequency of breastfeeding and the amount of milk consumed did not differ between infants aged less than six months receiving supplements and those fully breastfeeding. The lack of adequate supplementation of breastmilk after four to six months postpartum is associated, however, with poor child nutritional status. It is evident that the extension of amenorrhea in mothers of nonsupplemented older infants is at the expense of the child's nutritional status.

These studies indicate that the practice of supplementing a child's diet does not in itself lead to reductions in amenorrhea. In the Gambia and Zaire, children are fed gruels or paps at an early age, yet amenorrhea extends to nearly 18 months. The adequacy of the supplement and the way in which it is fed seem to play a major role in determining the eventual effect on reducing amenorrhea. The use of bottles in feeding reduces the length of amenorrhea substantially because of associated reductions in suckling. This association was directly observed in Scotland and has also been noted among the Hutterites and in Iran.

Table 1

## DURATION OF AMENORRHEA, SUPPLEMENTATION, AND FACTORS AFFECTING SUCKLING PATTERNS

	Length of Amenorrhea	Length of Breast-feeding	Age at Supplementation	Type of Supplement	Use of Bottles	Mother Sleeps with Child	Pacifier Used	Demand/Scheduled Feeding
Hutterites <sup>1</sup> (Rural U.S.)	6 Months	1 Year	1½ Months	Milk Cereals Juice	Yes	No	Yes	Scheduled
Iran <sup>2</sup> (Urban)	6 Months	1 Year	3-4 Months	Formula/ Milk Cereals, Milk	Yes	No	Yes	Demand
Scotland <sup>3</sup> (Urban)	8 Months	10 Months	4 Months	Formula Solid Foods	Yes	No	?	?
The Gambia <sup>4</sup>	15 Months	?	4 Months	Rice or Millet Gruel	No	Yes	No	Demand
Bangladesh <sup>5</sup>	17 Months	2½ Years	6-9 Months	Rice or Wheat, Gruel	No	Yes	No	Demand
Senegal <sup>6</sup>	19 Months	2½ Years	4 Months	Pap or Sorghum Banana or Cassava Paste	No	Yes	No	Demand
Kung <sup>7</sup>	25-28 Months (estimated)	3½ Years	6 Months	Pounded Nuts Roots, Berries	No	Yes	No	Demand

Source:

Huntington &amp; Hoestetler, 1966

Simpson-Herbert, 1978

Howle, et al, 1981

Lunn, et al, 1981; Rowland, et al, 1978; Rowland, et al, 1977

Chen, et al, 1974; Huffman, et al, 1980; Brown, et al, 1982

Hennart &amp; Vls, 1980; Carael, 1981; Vls, et al, 1975

Konner &amp; Worthman, 1980; Lee, 1979; Howell, 1979

In a U.S. study in which supplementation of infants was delayed until at least five months and no bottles were used, the observed duration of amenorrhea was 14 months. This suggests that if infants are fed without the use of bottles and the mother maintains her other "natural" breastfeeding patterns (including night feeds, no use of pacifiers, unscheduled feeds), extended amenorrhea may still result, although it would be of a shorter duration than under circumstances of poor or no supplementation (Kippley and Kippley, 1972). Recent studies in rural Mexico confirm these results. Ovulation did not return among women who gave their infants supplemental foods, but continued to suckle them more than ten times per day (Rivera, 1981).

Even when supplements reduce daytime feeds, night feeds may not be affected. An important finding from studies in Kenya suggests that as the child receives supplements (generally through the use of bottles), daytime breastmilk output and daytime suckling decrease (Van Steenberg et al, 1981). In contrast, night suckling time and number of feeds remain fairly constant for a year and a half. Nighttime feeding is probably more influenced by the child having the mother in close proximity, enabling suckling even when both are asleep, than dependent on the child's diet during the day. The influence of continued frequent nighttime feedings on prolactin and subsequently on fertility is as yet unexplored.

Maternal nutritional status appears to have only a minimal direct effect on the duration of either breastfeeding or on postpartum amenorrhea (Menken et al, 1981; Bongaarts, 1980; Huffman, 1982; Gray, 1978). Some authors have suggested that maternal nutrition indirectly affects suckling by enabling a well-nourished woman to produce more breastmilk with less suckling than one who is poorly nourished (Whitehead, 1981). The total amount of time spent suckling

by infants ages 18-36 months in Bangladesh did not differ by mother's weight for height (Huffman et al, 1980). However, in a Mexican study, supplementation of mothers did seem to result in higher milk outputs and was associated with less total suckling time by infants (Chavez et al, 1975), though the major factor affecting suckling time was supplemental feeding of the infant rather than maternal supplementation. In the Gambia, it is reported that suckling frequency was reduced when maternal caloric intakes increased (Whitehead, 1982). Since most studies find only a minimal association between maternal nutrition and postpartum amenorrhea (Huffman et al 1978; Bongaarts, 1980; Bongaarts and Delgado, 1978), it is doubtful that any effect of nutrition on milk output would have a substantial effect on fecundity through the pathway of suckling. There are two types of suckling: nutritive and non-nutritive. Only when the amount of non-nutritive suckling is limited would milk output be an important determinant of suckling. In developing countries where the breast is used to pacify children as well as for nutritive needs, the effect of improved maternal nutrition is unlikely to affect total suckling time.

A factor which does affect suckling patterns is maternal activity patterns. In Zaire, Kenya, the Gambia, and Bangladesh, declines in the frequency of breastfeeding have been observed during the seasons when agricultural activities increase for women (Vis et al, 1975; Hennart and Vis, 1980; Van Steenberg et al, 1978; Lunn et al, 1981); Chen et al, 1979; Huffman et al 1980). The changes in part may be responsible for the associated seasonal resumption of menses noted in Bangladesh, and for lowered prolactin levels observed in the Gambia (Huffman et al, 1980; Lunn et al, 1981).

### Policies to Increase Suckling

Policy recommendations needed to enhance suckling patterns appropriate to both extended breastfeeding and amenorrhea need to consider the effect on the child's nutritional status. Supplements to breastmilk are necessary from 4-6 months of age, and should therefore be encouraged. However, appropriate methods of feeding these supplements (by cup and spoon, rather than by bottle) should be supported in the context of continued demand feeding, nighttime feeds (which can be enhanced by continued practice of mother's sleeping with their infants) and without the use of pacifiers.

Given the currently available evidence, it appears that the effect of maternal nutrition on periods of amenorrhea is not likely to be substantial. Policies that support improving maternal nutrition are unlikely to reduce durations of amenorrhea, and may even help extend the duration of breastfeeding by reducing likelihood of early infant mortality.

### Factors Affecting the Incidence and Duration of Breastfeeding

As indicated above, suckling patterns can affect the initiation and duration of breastfeeding through physiologic mechanisms. Sociological and behavioral factors also influence the woman's decision to initiate and terminate breastfeeding. This section will discuss associations between certain sociobiological factors and incidence and duration of breastfeeding.

In the last several years numerous studies have assessed the current status of breastfeeding in several developing countries, including the WHO collaborative study in 7 developing countries, and the World Fertility Survey analyses in nearly 20 countries (WHO, 1981a; Lesthaeghe, 1982; Jain and Bongaarts, 1981). Country specific studies in Thailand and in Taiwan have also

been conducted which provide us with information on trends in breastfeeding (Knodel and Debavalya, 1980; Millman, 1980).

Most of these studies illustrate that urban women, women with higher educations and those with higher incomes are less likely to initiate breastfeeding and have lower durations than rural women, women with less education and those who are in lower socioeconomic classes. The extent of the variation in these factors, however, differs substantially according to the socio-cultural and development status of the country (Lesthaeghe, 1982).

There also appears to be a negative association between the use of modern health services and the incidence and duration of breastfeeding. (Knodel and Debavalya, 1980). The effect of employment status on breastfeeding is unclear. The comparison of the World Fertility Studies in seven countries conducted by Jain and Bongaarts (1981) indicated that whether or not women worked since marriage did not have important or consistent effect on the duration of breastfeeding. In a review of studies in which women were asked why breastfeeding was terminated, the percent who gave work as a reason to stop breastfeeding generally was less than 10% for studies conducted in 12 countries in Latin America and the Caribbean, 7 countries in Asia and the Pacific, 6 countries in North Africa and the Middle East, and 5 countries in Sub Sahara Africa (Esterik and Greiner, 1981). However, other studies, including those conducted in Thailand, the Philippines and Malaysia, suggest that female employment in certain circumstances, such as among urban women working outside the home, women working outside their villages in rural areas or women who earn high wages may negatively affect the duration of breastfeeding (Knodel and Debavalya, 1980; Popkin and Solon, 1976; Butz et al, 1981).

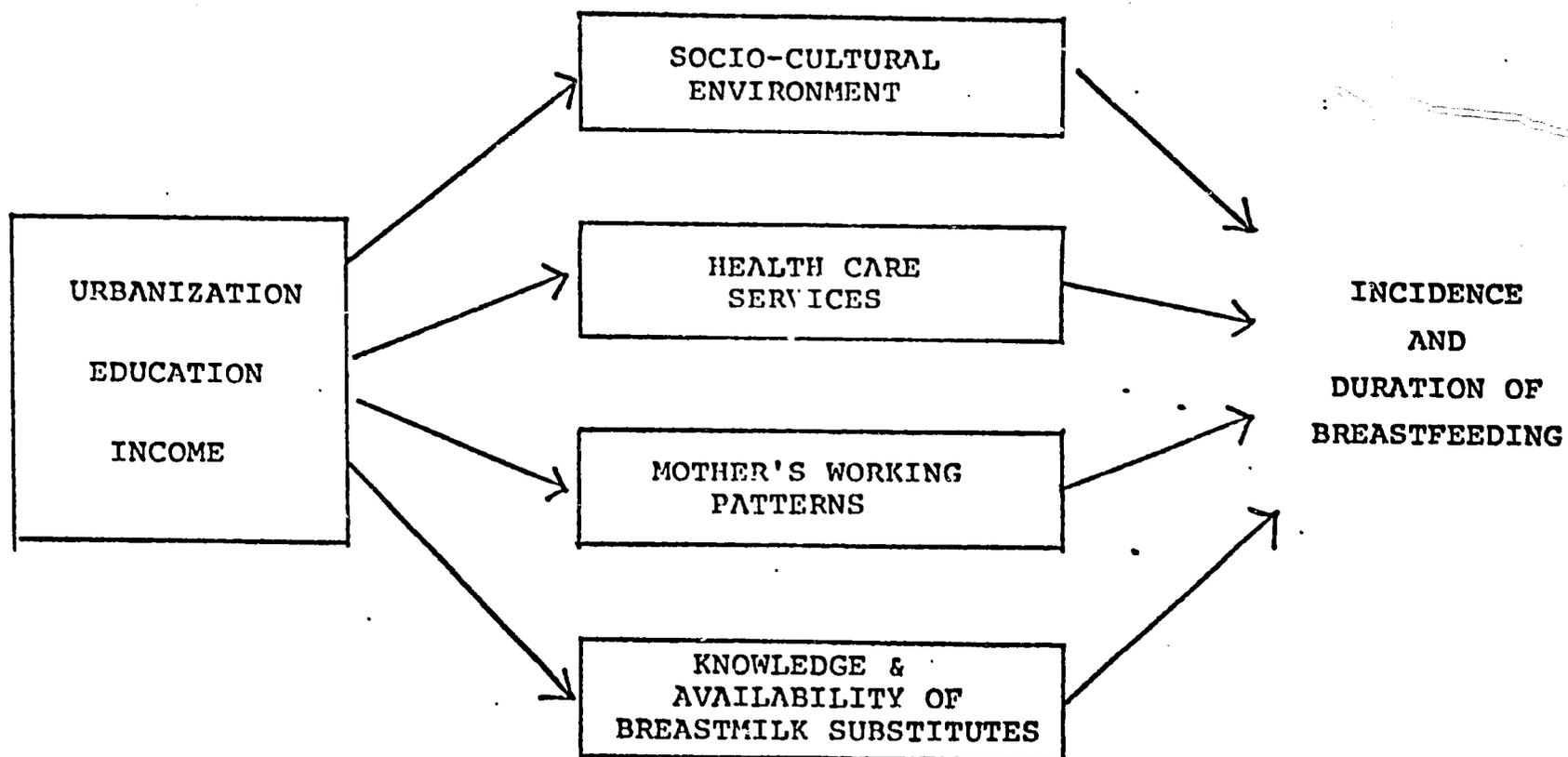
Although more difficult to quantify and to delineate specifically their effects, the availability of alternative forms of infant feeding and knowledge about this availability as influenced by the marketing of breast milk substitutes, as well as sociocultural factors, also appear to play a significant role influencing the incident and duration of breastfeeding.

Winikoff and her colleagues (Solimano, 1982) have described a framework illustrating the determinants of infant feeding practices. In this paper, we have adapted that framework for our purposes in Figure 2. We assume that the effects of urbanization, maternal education and socioeconomic status or income act through the intervening variables of health services, employment status of women, sociocultural factors and availability of breast milk substitutes. The pathways between the various segments of this framework can operate in both directions. The health and nutritional status of the mother has been left out of this diagram because although health and nutrition are important to the ability of the mother to produce breast milk, it is not a limiting factor under conditions that we are discussing of natural fertility in most developing worlds (Whitehead, 1981). Only under conditions of extreme famine are women unable to breastfeed. Although severe illnesses can cause failure of lactation, this is not likely to have an important demographic effect (Gray, 1982).

We will assume that the process of urbanization is beyond the scope of policy makers involved with population growth to control easily. We also assume that increasing women's education and income are desired outcomes, although they may be associated with declines in breastfeeding. Instead, we will assume that these three phenomena will continue, although there are mechanisms by which they affect breastfeeding that can be changed to enhance rather than decrease breastfeeding incidence and duration.

FIGURE 2

FACTORS ASSOCIATED WITH THE PREVALENCE OF BREASTFEEDING



### Socio-cultural environment:

Changes in breastfeeding behavior with modernization are caused by social, cultural and economic influences on parental attitudes and behavior in relation to self-images (Jelliffe and Jelliffe, 1978). Life-styles are influenced by examples of local elites, the influence of advertising and the procedures of health services.

As discussed previously, women in rural areas are more likely to initiate breastfeeding and to breastfeed for longer durations than women in urban areas. The reasons why urbanization is associated with lower prevalences of breastfeeding are unclear. Some have suggested that the lifestyles in modern cities are somehow incompatible with breastfeeding (Raphael, 1979). Others have stated that the decline in breastfeeding reflects a subconscious attempt to move from the traditional to modern culture (Jelliffe and Jelliffe, 1980). This is suggested by the rapid declines in breastfeeding noted among recent Mexican and Pakistani immigrants to the U.S. and U.K. respectively (Smith et al, 1982; Evans et al, 1976). Pelto (1981) states that one of the major features of modernization is the acquisition of material goods and technology of more economically favored societies. She suggests that the shift to bottle feeding may be another instance of the acquisition of western material culture and that the reasons for acquiring this practice of breastfeeding are variable and may include convenience, economic advantages and prestige emulation.

Family members can pressure women into bottlefeeding or breastfeeding for these reasons as well. Husbands, mothers and mothers-in-law all have been shown to have influences on the woman's infant feeding practices (Pelto 1981; Bryant, 1978). In Malaysia, mothers who live with parents, in-laws or other adult relatives are more likely to initiate breastfeeding than other women (Butz

and DaVanzo 1981). Such extended families are more prevalent in rural areas than in urban areas. This in part may explain the importance that social support has on breastfeeding.

Mathias (1979) states that the rapid movement away from breastfeeding in developing nations revolves around the dynamics of a change in basic values and the alternatives presented by the mass media. She suggests that by altering the message of the media to one that would encourage the maintenance of traditional values directed toward breastfeeding, it might be reestablished as a positive goal for all women regardless of socioeconomic class.

Other sociocultural factors that have been postulated to be related to the decline in breastfeeding include the perception of female breasts as symbols of sexual attraction, the sense of modesty about breasts, and the restriction in the practice of breastfeeding to private areas. This will make young girls less likely to be oriented toward breastfeeding by observation and imitation (Nag, 1982).

Aside from behavioral decisions not to breastfeed, many women who stop breastfeeding do so in spite of a verbal intent to breastfeed. One of the most common reasons given by women who stop breastfeeding is the insufficiency of milk. This seems more common among women in urban areas than among women in rural areas. An understanding of this "insufficiency of milk syndrome" therefore may help us delineate the sociocultural factors in urban areas that seem to inhibit breastfeeding.

Although it has been hypothesized that insufficiency of milk is caused by maternal malnutrition, this is unlikely since a higher proportion of women in developed countries report insufficiency of milk as a reason to stop breastfeeding than malnourished women in developing countries. In fact,

studies in many of the poorest developing countries, such as Bangladesh, Zaire and the Gambia, illustrate extended durations of breastfeeding over two years among chronically malnourished women. If malnutrition caused the termination of breastfeeding due to insufficiency of milk, it would be unlikely that such women would be able to breastfeed for such extended durations (Hennart and Vis, 1980; Whitehead, 1981; Huffman et al, 1980).

Others have speculated that the response of insufficiency of milk is given by women because it is more socially acceptable for mothers to switch to bottle feeding for this reason than for their true reason of convenience or embarrassment (Raphael, 1979). Gussler and Briesemeister (1980) observe that it is unlikely that women from so many cultures would be similarly motivated to give the same excuse of an insufficiency of milk.

The most probable explanation for this syndrome is that successful extended lactation is dependent upon appropriate suckling patterns. Whereas in rural areas women are exposed to other women breastfeeding and can learn by observation the essential techniques in breastfeeding, in urban areas this availability of support by relatives, neighbors and other women in the area is not available. Raphael (1979) points to the breakdown of supporting social networks in relationships such as these that promote breastfeeding in traditional rural areas. These networks ease the mother's anxieties and help to produce an environment where lactation can be successfully established and maintained (Gussler and Briesemeister, 1980). They speculate that the perception of "insufficient milk" results from a general lack of knowledge about the most appropriate and best pattern of delivering breastmilk to the infant, rather than from innate psychological inabilities of women to breastfeed.

In urban areas, few alternatives have emerged to help women overcome some of the difficulties inherent in isolated households. Women's groups and organizations have been formed in some countries to fill that lack but generally they reach relatively few (WHO, 1981b).

Our knowledge about the sociocultural factors affecting women's beliefs and attitudes, motivations and behavior with regard to breastfeeding are the least understood of any of the factors we will discuss. However, even with this lack of knowledge, it is evident that even in modern societies breastfeeding prevalence can be influenced by certain sociocultural factors. Just as the environment in the U.S. and other developed countries has changed from one of encouraging bottlefeeding to one encouraging breastfeeding, it appears that similar mechanisms could operate in developing countries to change the socioecultural factors affecting women's attitudes and beliefs in practices in relationship to breastfeeding.

Several countries have attempted nationwide programs to reverse the trend in breastfeeding decline by reorienting the socio-cultural environment in favor of breastfeeding. For example, in Brazil and the Philippines, school curriculums now include information on the appropriateness and benefits of breastfeeding (Marin, 1982; Solon, 1982). Radio and television campaigns have also been initiated, and pamphlets, and billboards have been used to illustrate the benefits of breastfeeding. Support groups of women have also been involved in changing the perceived attitudes toward breastfeeding in these countries. Mass media is helpful in changing attitudes about the appropriateness of breastfeeding and has been shown in other contexts to alter people's behaviors. A study conducted in Sweden noted a positive effect of mass media on the duration of breastfeeding (Sjolin, 1976). Mass media approaches are currently

being attempted in several developing countries. In Brazil, for instance, the Brazil National Breastfeeding Program based its media campaign on research revealing psychological blocks affecting women with respect to breastfeeding. The strategy in this campaign was to use testimonials by prominent women who have breastfed who thus urge other women to breastfeed as well (Manoff, 1982). As yet, this program is only in its initial stages and thus we do not have evidence as to its success.

Educational programs have also been shown to enhance breastfeeding. For example, in India and in Kenya, nutrition education associated with a primary health care program increased the average duration of breastfeeding (Kielmann et al, 1978; Were, 1980). Education of the father has been shown in other studies to have a positive effect on breastfeeding (DeChateau et al, 1977).

Another strategy that has been used evidently successfully in the U.S., is the use of breastfeeding support groups (Lada, 1972). Currently there are 30 breastfeeding support groups in 25 developing countries. In Nicaragua an offshoot of the National Women's Organization, Genesis II, is a support group involved with activities including promotions through radio, prenatal classes, counseling in breastfeeding, training of breastfeeding counselors and production of a newsletter to help professionals in hospitals. The Centro de Apoyo de Lactancia de la Materna (CALMA) in El Salvador, is involved in the training of health counselors. Other groups such as breastfeeding information groups in Kenya and the SuSu Mamas Group in Papua New Guinea have been strongly involved in working with the women to promote breastfeeding in their countries (Israel and Blumensteil, 1982).

### Health care services

Health care services in the past in most developing countries have been associated with lower rates of initiation to breastfeeding and lower durations. Whereas most births in rural areas are delivered at home, births to women in cities more often occur in hospitals where women have to contend with hospital routines, and are exposed to the beliefs and practices of trained health professionals. Such health professionals have often not been made aware of the benefits of breastfeeding, and practices in many hospital settings are detrimental to the initiation of breastfeeding.

Health professionals who consider infant formula to be as good as, if not better than breast milk also can influence the mother's view on the perceived adequacy of her breastmilk for the child's health (WHO/UNICEF, 1981b). Where women receive prenatal care during their pregnancy, the attitudes and beliefs of the health professionals have more of an opportunity to affect the woman's own knowledge and attitude about breastfeeding. Activities of health professionals may in part be affected not only by inadequate training but by promotional practices of the infant formula industry.

Interventions that have been shown to be successful in changing the negative effect of health care practices on breastfeeding have been summarized by Winikoff and Baer (1980). These interventions include information and support for the mother and changes in hospital routines.

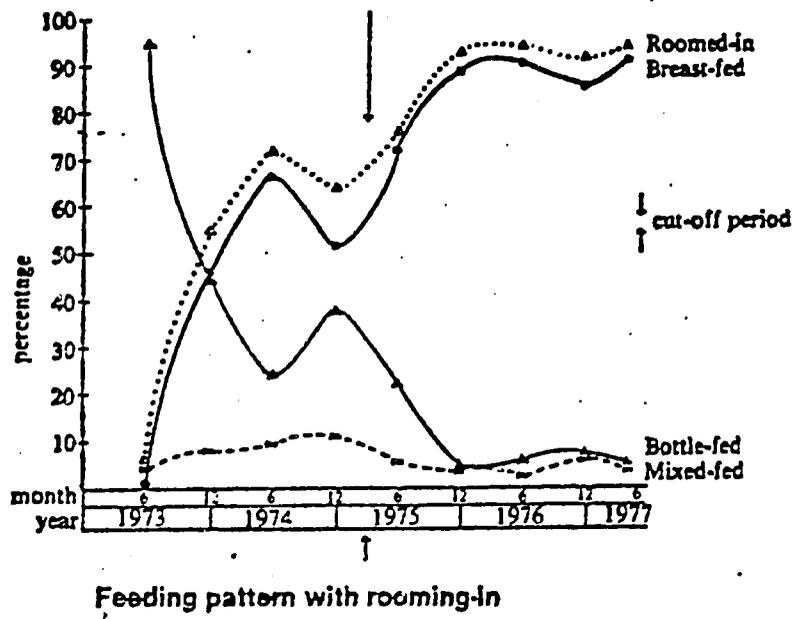
Several studies have indicated that women who have more reliable information on breastfeeding are more able to initiate and continue breastfeeding. In addition to information for the mother, it is also important that information and educational programs be aimed at hospital staff. This can help in changing attitudes and beliefs of health professionals and in providing

them with the necessary knowledge to help mothers initiate and maintain breastfeeding. A review of interventions that include information and support in developed countries illustrates substantial increases in breastfeeding when health professionals were provided with education, as well as education of fathers, and when mass media was used (Winikoff and Baer, 1980).

Other case studies have illustrated increases in the prevalence of breastfeeding through changes in hospital practices. In the Philippines in the Baguio General Hospital, hospital routines were changed between 1973 and 1977. During the first two years the routine was to separate infants in the nursery and give them bottlefeeding in combination with breastfeeding. Infant formula promotion was also allowed in the hospital. In the following two years, breastfeeding on demand was allowed with rooming-in and a shorter period of time between delivery and initiation of breastfeeding was provided. Formula promotion was prohibited. During the first period (January 1973-March 1975) 40% of infants were breastfed compared to 87% in the second period (April 1975-April 1977). Rooming-in increased from about 50% to 93% (Figure 3 illustrates the association of breastfeeding and rooming-in) (Relucio-Caleval, 1981).

Changes in hospital routines that include promoting immediate suckling after birth have been shown to increase the proportion of breastfeeding in Guatemala from 17% to 53% at six month postpartum and from 0 to 29% 12 month postpartum in Guatemala (Klaus and Kennell, 1976). Immediate suckling and rooming-in was shown by Sousa (1974) to increase the percent of breastfeeding at 2 months postpartum from 27% to 77%.

Figure 3



from Soysa, 1977.

The combination of changes in hospital routines and information and support programs were shown in Singapore to have a beneficial impact on the initiation of breastfeeding with 47% initiating breastfeeding in the control group compared with 72% in the group receiving support of breastfeeding by hospital staff and no supplementary feeding given to the infant (Wong, 1975).

Changes in hospital routines that are likely to positively affect the incidence and duration of breastfeeding include promoting immediate breastfeeding following delivery, and allowing for rooming-in where the infant is near the mother for night and day and not kept separately in a nursery. This will allow demand feeding so that the infant feeds whenever he or she desires instead of on a hospital schedule.

Supplemental bottles are not advised especially during the initial phases of lactation. The establishment of lactation is extremely important and thus any other supplementary bottles that are given to the child may reduce the child's hunger and thus lead to too infrequent suckling to maintain milk production necessary for maintenance of lactation.

Drugs given to the mother during labor and delivery pass to the infant through the placenta. Care should be used when such medications are given to women during the ante-natal period since certain drugs have been shown to inhibit successful initiation of lactation.

### Women's Working Patterns

Some authors have suggested that women's employment status has little effect on breastfeeding prevalence. This conclusion is primarily based on studies examining reasons for the termination of breastfeeding. Most of these studies illustrate that less than 10 percent of women report stopping

breastfeeding because of demands of employment. Others, such as Butz and Popkin have challenged this assumption providing data from Malaysia and the Philippines that suggests that work, in fact, does conflict with the breastfeeding patterns (Butz, 1982; Popkin and Solon, 1976).

Butz (1982) states that it is inappropriate to assess the impact of working status on breastfeeding through verbal reports since although women may not give it as the primary reason for terminating breastfeeding, there are other factors that indirectly influence breastfeeding that they also do not give (e.g., advertising of breast milk substitutes).

The issue is clouded because of the numerous factors associated with employment status that do affect breastfeeding. In developed countries, for example in Sweden and Hungary, where there is a high rate of female employment outside the home, breastfeeding incidences are quite high. However, the duration is low. In Sweden, for example, half of the breastfeeding women stop by three months and two-third by six months postpartum (WHO, 1981a). Such short durations of breastfeeding would have only a small effect on fertility regulation if they were to be the average for developing country women. Therefore, even though female employment opportunities outside the home are not necessarily incompatible with breastfeeding, there is little evidence currently available that illustrates extended breastfeeding in modern industrialized settings. However, numerous World Fertility Surveys illustrate breastfeeding durations of over one year in urban areas of Sri Lanka, Indonesia, Bangladesh, Pakistan and Kenya (Lesthaege, 1982). In these studies work status since marriage did not have an important or consistent effect on the duration of breastfeeding (Jain and Bongaarts, 1981).

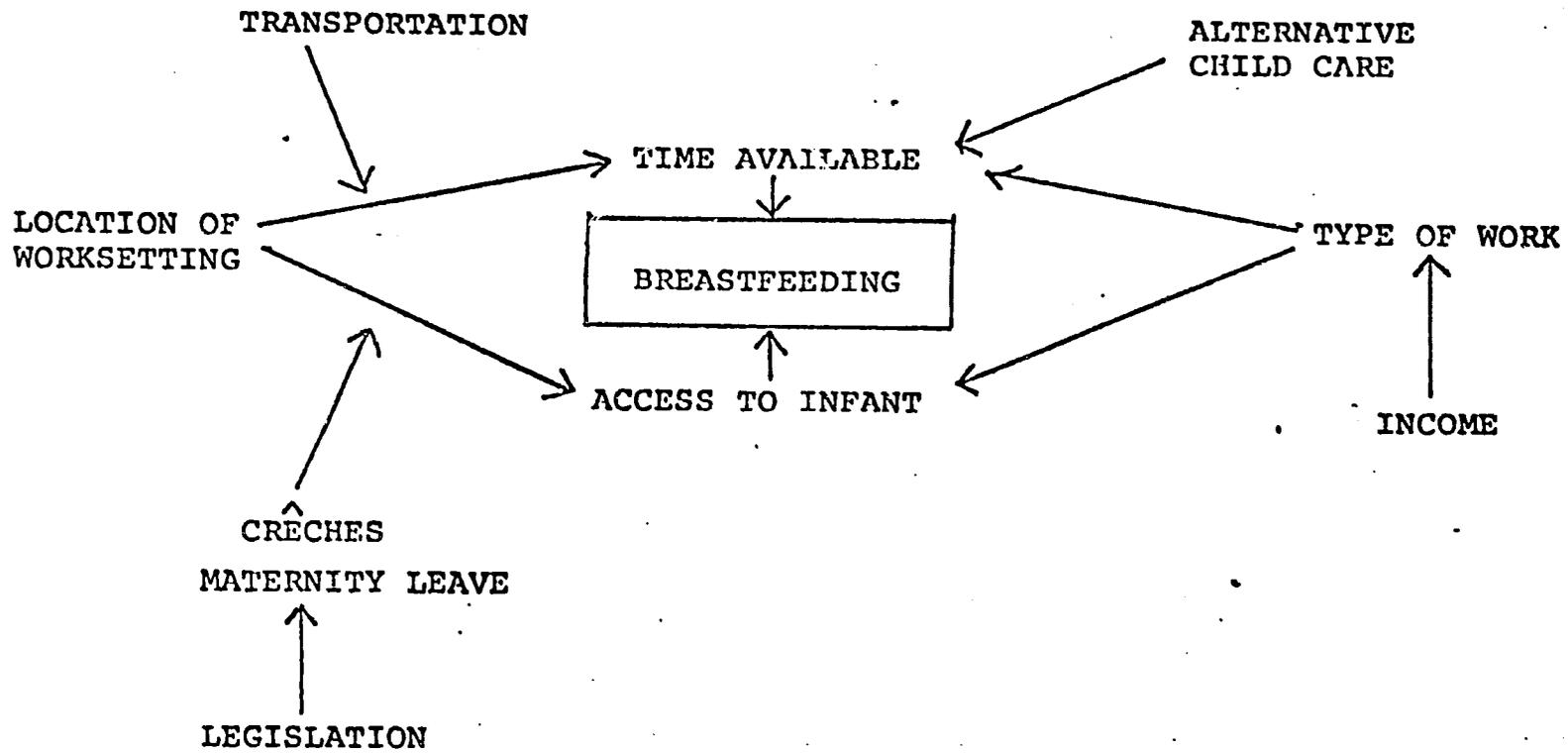
Concern for the effect of female employment on breastfeeding is focused on urban areas where the decline in breastfeeding has been most noticed. The following discussions, therefore, will be directed primarily on the effect of working patterns on breastfeeding in urban areas.

Figure 4 illustrates the factors that appear to influence whether female employment patterns will affect breastfeeding prevalence. The location of the work setting (or the distance of the work setting from the home) as well as the type of work, the other alternatives available for child care, and the income derived from the work all seem to be important. Whether the household and the woman herself find it economically feasible for her to participate in either market employment or household welfare employment depends on the relative differentials between the marginal value of her time in either market activities or household activities (Hamilton et al, 1981). The income she derives from wage earning work will therefore need to be sufficient to compensate for the travel time to and from work and the time she would need to give up in other household activities including child care, breastfeeding and food production/preparation.

In the Philippines, Popkin and Solon (1976) observed that women who worked in their own barrios had similar rates of breastfeeding as those who did not work, but for those who worked outside their own barrios the prevalence of breastfeeding was reduced. In Thailand, Knodel and Debavalya (1979) noticed that women working on the family farm were more likely to breastfeed than those working outside their own farms. As seems logical, work that is closer to the household appears to be compatible with breastfeeding and child caring activities (Ho, 1979).

Figure 4

ASSOCIATION OF WORKING PATTERNS WITH BREASTFEEDING



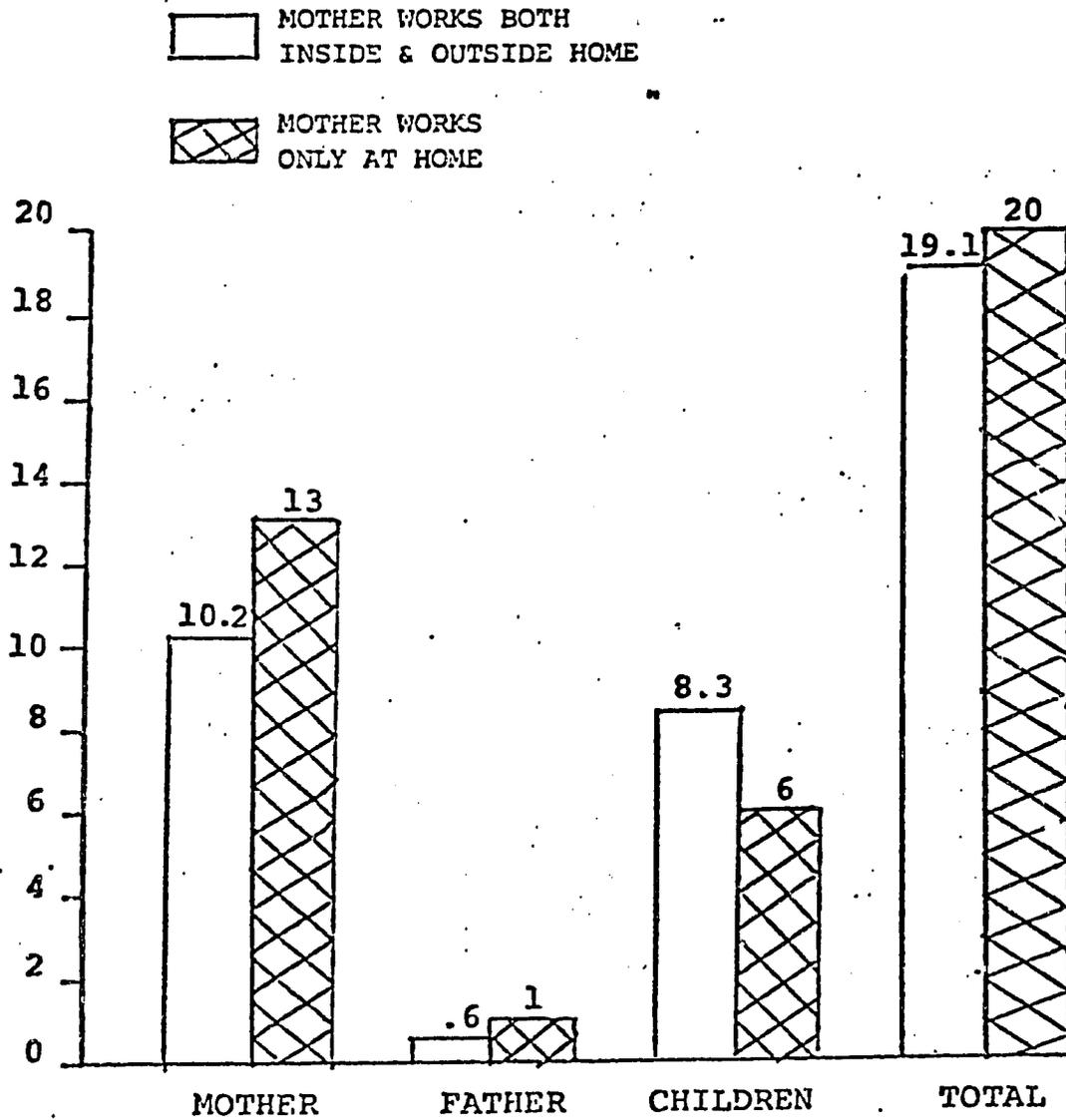
The type of work has been shown by DaVanzo and Lee (1978) to significantly affect whether women remain with their children. In their studies in Malaysia, women who were involved in sales or productive activities, including dressmakers, food and beverage makers, or weavers, were more likely to have children less than ten years of age with them when they worked, than those involved in other types of activities including professional occupations, managers, clerical and service occupations. Since breastfeeding is dependent upon the mother and child being together, we can deduce from these data that certain occupations are more likely to promote breastfeeding than other types of work. Both the Malaysian study and the Philippine study illustrate that child care is the activity that loses most of the mother's attention when she increases her market activities. This is illustrated graphically in Figure 5, taken from Popkins' Philippine study.

This figure also illustrates the next point which is the effect on breastfeeding of the availability of alternative patterns of child care, usually siblings or other relatives. In this figure other siblings are shown to be the ones to replace the mother in her child care activities. In a study by Harrell (1981) in Taiwan, it was illustrated that when mothers-in-law were living in the same household, mothers were more likely to work than when no such relative was available. However, in the Taiwan study there was no association with the prevalence of breastfeeding in relation to working.

As shown by Greiner (1977a) through time studies in Ghana, the amount of time spent per day breastfeeding infants was about 48 minutes in urban Accra. The amount of time needed to bottle feed was noted to be 27 minutes; however, an additional 38 minutes were necessary for preparation of the food and washing of the bottles. Although the time needed to breastfeed is

FIGURE 5

HOURS PER WEEK SPENT ON CHILD CARE BY FAMILY MEMBERS  
 ACCORDING TO WORK LOCATION OF MOTHER,  
 LAGUNA, PHILIPPINES, 1975-76



Source: Popkin, 1978.

therefore less than the total amount of time needed for bottle feeding, when this time can be substituted by a sibling or other family member, this frees the women by nearly an hour. Since mothers already are under considerable time constraints, any additional activities associated with work result in a decrease in time spent in other activities. Generally it appears that time for child care is what suffers, either in terms of decreased breastfeeding or decreases in other child care activities (Greiner, 1977a).

The type of work a women engages in can influence breastfeeding by affecting both her access to the infant and the time available with the infant. Breastfeeding is more likely to be compatible with part-time work or work that has flexibility in scheduling, as found when a woman works within her household and can alternate between her work activities with household activity easily. If women have children at their work setting, for example, through creches or nearby daycare centers and if the work is flexible and allows nursing breaks, women are more likely to have access to the children. However, when work is more highly structured and where such alternatives are not feasible as when women are employed in domestic work, there is less compatability with child care.

Since the 1919 Convention of the International Labor Organization (ILO), maternity protection has been ILO policy in industrial and commercial settings. Current policies include non-industrial and agricultural settings and state that women should have the minimum protection of allowable maternity leave of from 6-12 weeks and the provision of two nursing breaks per day of ½ hour each. Recommendations also suggest the establishment of nurseries either next to or within the work setting to enable women to breastfeed infants at work. In most cases, the obligation to provide these facilities is with any employer, who

percent of a low income workers salary, whereas in developing employs a minimum number of women, generally from 10 to 100. The tables in the appendices illustrate the policies on provision of nursery breaks and facilities for nursing mothers and infants in some selected countries (Jelliffe, 1977). Many developed countries including the UK, New Zealand, the United States and Canada do not have any provisions for nursing breaks or for nursing facilities while many of developing countries such as India, Sri Lanka, Tunisia, Haiti and Tanzania do provide specified provisions for nursing breaks and/or nursing facilities. Such legislation, if enforced, could help make the type of work more conducive to breastfeeding. However, it is important to note that the proportion of women involved in formal industrialized settings in most developing countries is small. For example, it is reported that half the female labor force in India is in the informal sector (Hamilton et al, 1981, p. 82). Therefore, although such legislation could be helpful to some women, it is unlikely to affect the majority of women in developing countries.

The income received from the woman's employment has a substantial influence on whether she will work or not, and it also appears to affect the likelihood of breastfeeding (Butz et al, 1981). Women who make higher incomes outside the home in a work setting are less likely to breastfeed. The interrelationships of education, income and household income are hard to separate. Obviously it is most desirable that women make more income in whatever work they perform. It should be kept in mind, however, that in order to compensate for the lost breastmilk as women increase their incomes, calculations illustrate that a high proportion of income is needed to satisfy the infant nutritional requirements. Often these are not satisfied and result in a decline of the child's nutritional status. The cost of providing formula to feed infants are illustrated in Table 2. In developed countries, the costs are about

Table 2  
COST AND AVAILABILITY OF INFANT FORMULAS

	per capitain GNP, 1975 \$	Cost of infant formula'		no. of brands available
		US \$	as percentage of per capita GNP	
Ethiopia	100	54-140	50-140	23
Nigeria	340	60-138	20-40	20
India	140	51-79	40-60	8
Philippines	380	49-127	15-30	24

Adapted from WHO, 1981, p.139.

5 percent of a low income workers salary, whereas in developing countries such as Burma it is as high as 73 percent (Sousa, 1974). Bottlefeeding can have a substantial cost for the families over and above what the mother earns. Reutlinger and Selowski (1976) have pointed this out in relation to cost in Calcutta. They estimated that the marginal propensity to spend income on milk to maintain the health status of children would be over 50% for infants aged 0-6 months. With an observed marginal propensity of only about 6%, they suggest that a decline in breastfeeding as a result of mother's participation in the labor force could have an important negative effect on the nutritional status of the child. This has been shown to be the case in Malaysia and Peru (Butz et al, 1981; Franklin and Vial, 1981).

#### Availability of Breastmilk Substitutes

The WHO collaborative studies illustrated that in Nigeria, Guatemala and the Philippines free milk samples were commonly distributed in hospitals to postpartum women during the 1970's. In Guatemala, breastfeeding was less common among those who had received samples. In the Philippines, breastfeeding was also less among a high proportion of the upper class women who received the samples. However, in the rural Philippines there was no association between the provision of free samples and breastfeeding (WHO, 1981a, p.77). In Malaysian studies there was no association between the prevalence of breastfeeding and the availability or price of infant formula in communities where the mother lived. Butz suggests that in Malaysia breastfeeding declined before the beginning of wide spread commercial merchandizing of infant formula.

The strongest evidence for an association between marketing of breastmilk substitutes and influences on decreasing breastfeeding is available from a natural experiment in Papua New Guinea. In 1976 an infant feeding survey in Port Moresby, the capital city, showed that one-third of the children under age two years were being artificially fed, with a substantially higher rate of malnutrition in the artificially fed children compared to those who were being breastfed (Biddulph, 1981). Following a survey, legislation was passed which prohibited the advertising of baby bottles, and breast milk substitutes such as infant formulas. In 1977 the Baby Food Supplies Control Act became law. Under this law, feeding bottles and nipples could only be obtained from pharmacists with a prescription signed by a registered health worker. Before writing the prescription the health worker was required to instruct the mother on how to clean the feeding bottles, how to mix the milk formula in correct strength, and how to store the prepared milk formula in the refrigerator when not used immediately. Both pharmacists and health workers could be fined substantial sums if these laws were broken. Along with these measures, there was widespread publicity in the press on the advantage of breastfeeding. Nutrition became a component of the health curriculum and emphasized breastfeeding to school children and the importance of breastfeeding became a strong part of the curriculum in schools for health workers. Feeding bottles were restricted from use in hospitals and artificially fed children were fed using spoon and cup. The prevalence of breastfeeding increased from 65 percent in 1976 to 88 percent in 1979 among children less than two years of age in Port Moresby (Biddulph, 1981). These studies suggest that the advertising and promotion of breastmilk substitutes can have a negative influence on breastfeeding.

### Policy and Program Opportunities to Enforce Breastfeeding

Given the pathways in which breastfeeding can be influenced, our concern now is to decide where policies and programs should attempt to alter the negative influences on breastfeeding.

Probably the most difficult area in which to intervene is that of the socio-cultural environment. Evidence from developed countries suggest that increases in breastfeeding have been observed in the last ten years because of changes in the view by women and society in general as to the appropriateness of breastfeeding. Much of this appears to have taken place because of an increased understanding of the benefits of breastmilk, with health professionals and the general public becoming more supportive of breastfeeding. This process could perhaps be enhanced in developing countries with the promotion of breastfeeding through the mass media, through support groups, for breastfeeding women and through education in the schools.

Health care services should be revised to promote and enhance success in breastfeeding. In order to change hospital routines it is first essential to train health professionals and encourage their support of the promotion of hospital routines that will be conducive to breastfeeding. These include rooming-in and therefore demand feeding, immediate postnatal contact between mother and child following delivery, cautious use of drugs during labor and delivery, limited use of supplemental bottles, appropriate information given to mothers during the prenatal, antenatal and postnatal period, and no distribution of free samples of infant formula given to the mothers in the hospital.

In order to promote breastfeeding among women with varying working patterns enforcement and publicity to the public about existing laws on maternity leaves and nursing breaks will help the small minority of those

involved with the formal sector. It will also be important to establish new laws in those countries that are currently not in accord with ILO recommendations. The enforcement of existing laws has been tried successfully in Brazil in the state of Santa Catarina. In 1979 a study estimated that less than 10 percent of industries with more than 30 women employees had creches. This was suggested to be due to low penalties, lack of monitoring by the government, a lack of interest by the unions, and women not being aware of the law (Manoff, 1982). One year after the registration of creches by the Federal Department of Labor and especially instituted inspections 85 percent of the small industries had creches and 60 percent of the nursing women in these industries were using them. This example illustrates the importance of advertising the availability of such laws and in enforcing laws to enhance women's opportunities for breastfeeding while working (Jelliffe and Jelliffe, 1982; Manoff, 1982).

As illustrated previously, one of the major problems of women in developing countries who are working outside the home is the limitation of time. Any timesaving methods that can be promoted may help to enhance her ability to breastfeed. This would include enhanced transportation, availability of water supply and availability of electricity. All of these factors are associated with modernization and the development process. However, in this context, small-scale changes may be beneficial. For example, transportation could include the provision of a cooperative bus that travels to and from a barrio or flavella to an industry rather than women having to rely on public transportation. Water supply could be increased in the community by increasing availability of pumps or a greater availability of faucets nearby the homes.

Probably the most beneficial method to increase breastfeeding by working women is through the encouragement of partial breastfeeding for extended

durations. This will depend on encouraging women to breastfeed before they go to work, once they return home from work, before they go to sleep and also during the night. The encouragement of partial breastfeeding can be made through media campaigns, education, through the health services through work and industrial settings, and also through the use of womens support groups. This is apparently an option that has been tried by many women in the U.S. who work and still breastfeed.

In order to decrease the availability of breastmilk substitutes and its effect on breastfeeding, perhaps the most appropriate policy option is the enforcement of the International Code of Marketing of Breastmilk Substitutes that was approved by the World Health Assembly in 1981. The Code included activities in relation to the provision of information and education on breastfeeding:

- restrictions on promotion of the use of breastmilk substitutes or bottlefeeding to the general public and women directly,
- encouragement of health workers to promote breastfeeding,
- limitations set on manufacturers and distributors in relation to marketing practices,
- instructions for labeling on infant formula which illustrate the superiority of breastfeeding as well as the proper use of breastmilk substitutes.

Legislation has been passed by such countries as Papua New Guinea, Guinea Bissau and others which do restrict either the sales or advertising of breastmilk substitutes or supplies. This is seen by some countries as a feasible option, while others have decided not to pass legislation but to promote encouragement of the code voluntarily.

### Family Planning Services and Breastfeeding

In the above discussions the role of family planning services has not been specifically mentioned. It is important that these services be aware of factors influencing breastfeeding and incorporate within their programs information to women on breastfeeding and education of family planning workers on the benefits of and techniques for breastfeeding.

More directly, family planning services can have a role in affecting breastfeeding through the cautious prescription of contraceptives during their early postpartum period when breastfeeding is being established. The most appropriate contraceptive for the early postpartum period are those that will not interfere with breastfeeding at all, including condoms, foam or other barrier methods. The risk of conception is very low during this first postpartum period for women who are fully breastfeeding and therefore these are feasible low-risk options. Following the establishment of breastfeeding for women who want to use more highly effective forms of contraception, progesterone-only pills, or Depo-Provera and IUDs should be given priority over the combined pills. It has been shown that even low dose estrogen progesterone combinations appear to have a negative effect on breastmilk output (Koetsawang, 1982). However, when these options are not available or acceptable for women, cautious policies need to be established on the use of combined contraceptives among breastfeeding women. Anecdotal evidence from Brazil and the U.S. among low income women indicate that if oral contraceptions are not given to breastfeeding women, then women will stop breastfeeding in order to take them. Other studies in Haiti did not observe a decrease in breastfeeding even though the formal policy limited the use of pills among breastfeeding women (Bordes et al, 1982).

A major question that may be asked is why family planning program managers should care about the duration of breastfeeding since women who initiate contraception will be protected regardless of their breastfeeding status. The important point to note here is that with high discontinuance rates, protection afforded by contraception may be minimized due to drop-outs from the program. It would be more advantageous to have women initiate contraception closer to a time when they would not already be protected by breastfeeding. Lesthaeghe (1982) has shown that if substantial declines in breastfeeding were to occur, contraceptive use would need to increase substantially to attain current and already high levels of fertility in many countries. This is illustrated in Table 3. Therefore, the importance of breastfeeding in maintaining current fertility levels must be recognized by family planning policy makers and program managers.

#### SUMMARY

In recent years, many governments have become concerned with declines in breastfeeding because of health considerations. It is appropriate that population policies and programs also give consideration to this because of the role of breastfeeding in fertility regulation. Both groups should attempt to enhance the circumstances in which women can initiate and maintain breastfeeding for both its health and fertility implications.

TABLE 3  
AMENORRHEA, CONTRACEPTIVE USE, AND FERTILITY

Country <sup>a</sup>	Year	Mean duration Amenorrhea (months)	TMFR <sup>b</sup> (17-49)	Contraceptive Use w/ Amenorrhea at 3 mos	Current Level of Contraceptive Use <sup>c</sup>
Bangladesh	1976	22	6.3	52 %	9 %
Nepal	1976	21	6.9	47 %	2 %
Indonesia	1976	18	5.7	57 %	26 %
Sri Lanka	1976	16	6.0	58 %	32 %
Pakistan	1975	15	7.4	39 %	5 %

<sup>a</sup> World Fertility Survey  
<sup>b</sup> Total Marriage Fertility Rate  
<sup>c</sup> Proportion of currently married women

Adapted from Lesthaeghe, 1982.

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APPENDIX  
(From Jelliffe, 1977)

**Table: 1. PROVISION OF NURSING BREAKS AND FACILITIES FOR NURSING MOTHERS AND INFANTS IN SOME SELECTED INDUSTRIALIZED AND THIRD WORLD COUNTRIES**

COUNTRY	DURATION OF BREAK	SPECIAL CONSIDERATIONS	AGE OF INFANT	REMUNERATION	AVAILABLE NURSING FACILITIES
<b>WHO: AFRICAN REGION</b>					
Eastern Cameroons	(2) ½ hr. breaks		up to 15 mos. of age	not specified by law	
Dahomey	(2) ½ hr. breaks		up to 15 mos. of age	not specified by law	
Malagasy Republic	(2) ½ hr. breaks		up to 15 mos. of age	remunerated	
Nigeria	No provision by law				
Tanzania	(2) ½ hr. breaks			not specified	
Zambia	No provision by law				
<b>WHO: REGIONS OF THE AMERICAS</b>					
Argentina	(2) 7 ½ hr. breaks	More frequent if medical certificate available		not specified by law usually production workers affected	Nursery to be provided if more than 30 female employees
Brazil	(2) ½ hr. breaks		up to 6 mos. with possible extension		Responsibility of employer to establish nursing premises or nursery or may be allowed to finance child assistance groups
Canada	No provision for nursing breaks				No provision for crèches
Cuba	Nursing breaks established			Remunerated	
Costa Rica	(2) ½ hr. breaks	Mother may take 15m break every 3 hrs.		Breaks remunerated	Responsibility of employer to establish or nurseries
Guatemala	(2) ½ hr. breaks	Mother may take 15m break every 3 hrs.		Breaks remunerated	Responsibility of employer to establish nursery premises or nurseries
Haiti	(2) ½ hr. breaks	Mother may take 15m break every 3 hrs.	Until child 2 years old	Breaks remunerated	Employer must provide nursing room & nursery if more than 50 female employees
United States	No provision for nursing breaks				No provision for crèches; some nurseries established for mother's receiving Aid to Families with Dependent Children

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COUNTRY	DURATION OF BREAK	SPECIAL CONSIDERATIONS	AGE OF INFANT	REMUNERATION	AVAILABLE NURSING FACILITIES
WHO: EASTEN MEDITTERANEAN REGION					
Cyprus	No provision for nursing breaks				
Iran	½ hr. breaks	Every 3 hrs.		Remunerated	Employer responsibility to nurseries at or near place of employment
Israel	(2) ½ hr. breaks		No age limit	Remunerated	Use of extensive Kibbutz system
Sudan	No provision for nursing breaks				
Tunisia	(2) ½ hr. breaks		Up to 1 yr. of age	Not specified by law	If more than 50 women of 15 yrs. employed a nursery room must be provided
WHO: EUROPEAN REGION					
Belgium	No provision for nursing breaks				
Finland	No provision for nursing breaks				Social welfare legislation provides good facilities for infant care
France	(2) ½ hr. breaks	20m break if nursery on premises	Up to 1 yr. old	Remunerated	No facilities required if 100 women over 15 yrs. of age employed.
Poland	(2) ½ hr. breaks				State financed nurseries in or near undertakings, mothers contribute to cost of facilities. Employer provides nursery for breast fed infants not more than 15 mos old, if more than 100 female workers.
Rumania	(2) ½ hr. breaks	Not more than 3 hrs. apart	No age limit	Remunerated	Stated financed nurseries series near or in undertakings, mothers contribute to co.'s
Sweden	No specified time	Time and duration by arrangement between employer and employee	No age limit	No obligation by law to remunerate mothers	Many facilities for infant care exist, often financed on co-operative basis
U.K.	No provision made for nursing breaks				

COUNTRY	DURATION OF BREAK	SPECIAL CONSIDERATIONS	AGE OF INFANT	REMUNERATION	AVAILABLE NURSING FACILITIES
WHO: S.E. ASIAN REGION					
India	2 breaks	Time determined between mother and employer	Up to 15	Remunerated	If more than 50 female workers. Employers must provide nurseries for children up to 6 yrs. old
Sri-Lanka	(2) ½ hr. breaks	Extended to 1 hr. if no nurseries premises	Up to 12 months	Remunerated	
WHO: WESTERN PACIFIC REGION					
China (PR)	20-30m every 3 or 4 hrs.			Remunerated	Nursery provided by administration and trade union, if more than 20 children under 4 years. Parents pay cost of food
Japan	(2) ½ hr. breaks		Up to 12 months	Remunerated	
New Zealand	No provision made for nursing breaks				
Malaysia	No provision made by law	Arrangement often made between mother and employer			Nursery to be provided by employer