Demographic Affects of Breast Feeding

Vincent Holzhall
Department of Anthropology
Columbia University
New York, New York

Human demography is the study of patterns of death, survival, reproduction and growth of populations. Although the rubric of demography is vast, three major variables act upon any given population: birth, death, and migration (Bodmer and Cavalli-Sforza 1976:261-263). The interaction of these three variables will determine the viability of any living population.

Breast feeding of infants in human populations affects two of the three variables mentioned above: birth and death. However, this fairly straightforward issue has been complicated by the recent abandonment of prolonged breast feeding as the primary method of infant nourishment in both the industrialized world and in large portions of the Third World (Buchanan 1975:J49; Knodel 1977:1111). This complication has drawn the attention of many: including demographers, public policy makers, and even baby food manufacturers (Wade 1974). The purpose of this paper is to elucidate how the practice of human breast feeding affects the demographic variables of birth and death within the context of changing, infant feeding patterns.

Although the exact date of emergence of anatomically modern Homo sapiens can never be specifically determined, a range of about 70,000 B.P. to 30,000 B.P. appears to be in accord with available evidence (Fagan 1989; Smith and Spencer 1985; Wolpoff 1980). From this early, prehistoric point until the advent of the bottle, breast feeding was relied upon as a major form of infant feeding. Of course, isolated instances existed which deviated from this pattern, such as sugar water substitution for breast milk in heavily industrialized 19th century Central Europe (Knodel 1977:1111); but from the demographic point of view, these deviations are not significant in the overall scheme. With the advent of the bottle, the natural pattern of breast feeding was abrogated within a few generations. The demographic impact of this change is both significant and substantial.

It is estimated that 95% of all women are physically capable of successful breast feeding. In the first six months of an infant's life, breast milk provides 100% of all nutritional requirements. After six months and until
approximately one year of age, breast milk provides about 75% of an infant's nutritional requirements (Buchanan 1975). As can be seen, after six months an infant must be fed supplementally in order to remain healthy. "Until about 50 years ago virtually all infants were breast-fed" (Buchanan 1975:J54).

Human lactation affects the demographic variable of birth. In a summary of studies conducted in developing areas of the world, Van Ginneken (1974) shows that in non-contracepting populations the practice of breast feeding reduces fertility. In short, a population in which breast feeding occurs increases the length of postpartum amenorrhea experienced by this population's, women. By increasing intervals between birth fertility or growth rate of the population may be increased or slowed down. This process involves a complex hormonal feedback system which is activated by the infant's stimulation of the mother's nipple; this stimulation results in lactational amenorrhea and suppressed ovulation (Buchanan 1975:J50-J54). In effect, breast feeding reduces the amount of births in a given population. To demonstrate the significant influence breast feeding has upon birth rates, a few examples may prove useful.

In a study of 5,000 Taiwanese women infant breast feeding was observed to extend for an average of 15 months along with an amenorrheic period of about 10 months (Jain, et al. 1970:259). As was expected, those mothers who breast fed for longer periods of time experienced longer periods of lactational amenorrhea than did those mothers who breast fed their infants for a shorter period of time. The investigators concluded that practicing lactation may reduce by up to 20 percent the number of potential births that would occur if lactation was not practiced at all (Jain, et al. 1970:269).

Also, a study in the Javanese village of Mojolama (Singarimbun and Manning 1976) found a high correlation between breast feeding and postpartum amenorrhea. The average mother (whose infant survived until weaning) breast fed about 25 months and experienced an amenorrheic period of about 18 months (Singarimbun and Manning 1976:175-176). In this case, most lactating mothers began menstruation for almost a year after delivery, it does not extend postpartum amenorrhea indefinitely" (Buchanan 1975:J56).

This Javanese village is not the only example of the extreme effects that breast feeding can have upon amenorrhea and birth intervals. The !Kung San of the Kalahari Desert usually breast feed their children for about 24 to 36 months and experience a period of
amenorrhea lasting around 25 months (Lee 1979:325-330). As can be evidenced in these cases and others (i.e., Huffman et al. 1978; Cantrelle and Leridon 1971), breast feeding directly reduces the number of births in a population through the mechanism of postpartum, lactational amenorrhea.

Most recently, a study (Thapa et al. 1988) based upon data from the World Fertility Survey estimates the reduction of potential fertility due to contraception and breast feeding in the geographical areas of Africa, Asia, and Latin America. The study found that breast feeding inhibits an average of four births per woman in both Africa and Asia, whereas breast feeding only inhibits an average of two births per woman in Latin America (Thapa et al. 1988:680). Only in Latin America does artificial contraception prevent more potential births than does breast feeding. From these kinds of data, it can be seen that breast feeding plays a substantial role in retarding population growth and fertility. In a direct way, human lactation affects the demographic variable of birth.

In addition to affecting birth and fertility, human lactation affects the demographic variable of death in the form of infant mortality. Human infants who breast feed have a reduced risk of mortality. A review of available, historical evidence of European populations reveals "that the difference in mortality between breastfed infants is enormous, even staggering" (Marcy 1981:319). More recently, in a survey and study of twelve Latin American countries, Palloni and Millman concluded that their "analysis consistently uncovered significant mortality reductions attributable to breast feeding" (Palloni and Millman 1986:230). The health benefits of breast feeding an infant may be summarized as follows: highly nutritious; protective, due to immunological qualities; and safe from contamination and/or spoilage (Buchanan 1975:149). [See Appendix I for a more detailed description of the health benefits of breast feeding.]

Specific case studies also confirm the mortality reducing affects of breast feeding. In an analysis of 1,262 randomly selected Malaysian households (DaVanzo et al. 1983), the investigators concluded that "longer durations of full breast feeding (without supplementation) substantially reduce the mortality of infants in our sample (DaVanzo et al. 1983:395)." Infant mortality was directly reduced in this study by the important health benefits of breast feeding previously noted. In addition, breast feeding prolonged the mother's amenorrheic period, thereby increasing the interval between successive births. The Malaysian study found a strong correlation between longer birth intervals

67
and lower levels of infant mortality (DaVanzo et al. 1983:391).

In support of this point, data relating to 8,456 live births in rural portions of Senegal (Cantrelle and Leridon 1971) demonstrate the higher rate of mortality associated with shorter birth intervals. Although most mothers breast fed their infants for about 24 months, mothers who were forced to discontinue breast feeding due to pregnancy (shorter than usual birth interval) increased the probability of infant death in the first year after premature weaning anywhere from 50 to 150 percent (Cantrelle and Leridon 1971:532).

Breast feeding practices have affected infant mortality in the United States as well. In an analysis of R.M. Woodbury's study conducted in 1925, Knodel and Kintner (1977) re-present the data from approximately 23,000 live births in eight United States cities from 1911 to 1916 in graphic form (Knodel and Kintner 1977:399). From this graph it can be seen that infants breast fed for 12 months had a mortality rate around 35 per 1,000; and infants breast fed for only 2 months had a mortality rate of 120 per 1,000. Clearly, breast feeding has an effect upon the demographic variable of death as seen in the case of infant mortality.

From the demographic point of view, breast feeding populations tend to have a reduced fertility level and a reduced population growth rate. Breast feeding populations also tend to have a decreased rate of infant mortality compared to those populations that do not practice breast feeding. On the other hand, non-breast feeding populations tend to experience higher rates of fertility in conjunction with higher rates of infant mortality.

For some, the demographic point of view is impersonal and interested only in populations, not people. Others may contend that the above demographic data do not consider modern, western medical practices or properly prepared substitutes for human breast milk. These criticisms may be countered from a demographic standpoint.

First of all to know that in a survey and study of 29 developing countries, a mother who gives birth to a second child before the first child reaches his/her first birthday increases "the risk of dying [for the child] between the ages of one and five by at least 77%" (Thapa et al. 1988:681-682), is demographic data easily translatable from the impersonal to the personal. Secondly, breast feeding practices and "the process of
lactation as it occurs among primitive and peasant populations [are] generally not comparable to [those] which occur in highly industrialized civilizations such as those found today in the United States and Europe" (Solien de Gonzalez 1964:875). This difference is attributable in part to variables such as water quality, sanitation, presence of hospitals (DaVanzo et al. 1983:396,398), availability of refrigeration, sterilization of equipment (Buchanan 1975:J49), basic nutrition (Winikoff 1978:897), and artificial means of contraception as well as differing breast feeding techniques such as scheduled versus non-scheduled, "on demand" feedings (Solien de Gonzalez 1964:875).

In a sense, the demographic data concerning breast feeding do not consider modern, western medical practices because the majority of people in developing areas of the world do not have access to these kinds of resources. But also important is that "evidence does exist suggesting that there is still a significant health-promoting effect of breast-feeding, even where sanitation and education levels are high" (Winikoff 1978:897). To a degree modern, western medical practices and properly prepared substitutes for human milk do not and cannot replace human breast milk and its qualitative as well as quantitative affects upon individual mothers and infants, and populations in general.

As demonstrated in this paper, breast feeding directly affects the demographic variables of birth and death. In particular, a breast feeding population tends to experience a lower growth rate coupled with a lowered infant mortality. These demographic facts translate into a healthier population and a slower and more stable rate of population growth, characteristics usually sought by public health officials and public policy makers. Yet increasingly, populations are moving away from breast feeding practices and toward the practice of bottle feeding despite the human and economic costs involved. Kenya alone is estimated to lose $11.5 million annually substituting cow milk and infant formula for human breast milk (Wade 1974:45). From a demographic point of view, the recent shift from breast feeding to bottle feeding does not seem to make sense. Although "breast feeding and birth spacing save lives" (Thapa et al. 1988:682), the shift from breast to bottle "owes much to the commercial activities of the baby food industry" (Wade 1974:46). The presence of baby food companies and infant formula manufacturers in developing countries as well as in the more industrialized world appears to be a starting point for explaining the seemingly nonsensical change in infant feeding patterns (See Van Esterik 1989).
Appendix I

"The impotance of breast feeding for children's health has been emphasized by laboratory evidence on the biochemical, nutritional, immunological, and antiallergenic properties of breast milk, as well as by epidemiological studies showing improved nutrition, health, and survival among breast-fed babies. It has become apparent that mothers' milk is not only precisely tailored to the nutritional needs of human infants, but it is also a living fluid with active and passive factors to protect against infection. The truly remarkable nature of these properties is demonstrated by recent findings that secretory immunoglobulin A-producing cells in milk come originally from lymphocytes in the gastrointestinal tract of the mother. These cells respond precisely to the pathogens present in the immediate environment of the mother (and baby), travel to the breast, are excreted in the milk, are ingested by the baby, and protect the baby's gastrointestinal tract against the organisms most likely to threaten health at that particular instant. More elegant tailoring of host defenses to shifts in environmental threats could hardly be imagined. This precision certainly cannot be replicated by either prepared infant formulas or technical medical interventions such as immunizations or health care services."

[Winikoff 1978:897]

"Recent studies also suggest that, in the United States, breast feeding can nearly halve the risk of breast cancer relative to that of a parous woman who bottlefeeds her babies; the longer a woman breast-feeds, the greater the protection."

[Thapa et ale 1988 :682]
References Cited

Bodmer, W.F. and L.L. Cavalli-Sforza

Buchanan, Robert

Cantrelle, P. and H. Leridon

DeVanzo, Julie, W.P. Butz and J.P. Habicht

Fagan, Brian M.

Huffman, Sandra, A.K.M. Alauddin Chowdhury, J. Chakraborty and W. Henry Mosley

Jain, Anrudh K., T.C. Hsu, Ronald Freedman, and M.C. Chang

Knodel, John

Knodel, John and Hallie Kintner

Lee, Richard Borshay

Marcy, Peter T.
1981 Factors Affecting the Fecundity and Fertility of Historical Populations: A Review. Journal of

Palloni, Alberto and Sara Millman

Singarimbun, Masri and Chris Manning

Smith, F.H. and Spencer, F

Solien de Gonzalez, Nancie L.

Thapa, Shyam, Roger V. Short, and Malcolm Potts

Van Esterik, Penny

Van Ginneken, Jeroen K.

Wade, Nicholas

Winikoff, Beverly

Wolpoff, Milford H.