PN-AAW-272

47987

THE INFANT FEEDING STUDY:

BOGOTA SITE REPORT

Beverly Winikoff, M.D., M.P.H.
Michael C. Latham, M.D., D.T.M.& H., M.P.H.
Giorgio Solimano, M.D.

Mary Ann Castle, Ph.D
Virginia M. Laukaran, Dr.P.H.
Penny Van Esterik, Ph.D
James E. Post, J.D., Ph.D
Robert A. Smith, Ph.D
Lily W. Lee, Ph.D
David Trail, M.A.
Trost Associates, Inc.

Belen Samper de Paredes, M.A.
Maria Eugenia Romero, M.A.
Adela Morales de Look, M.A.

A report submitted to AID by the Population Council in fulfillment of Contract No. AID/DSAN-C-0211. In addition, the following donors provided support for portions of data analysis: UNICEF, the Rockefeller Foundation, and International Development Research Centre (Centre File: 3-P-83-0061).

TABLE OF CONTENTS

		Page
I.	INTRODUCTION AND STUDY DESIGN	1
	Ethnography: Methods and Site Description Survey Methods	
II.	CHARACTERISTICS OF THE STUDY POPULATION	11
	Households Index Mothers Index Children	
III.	INFANT FEEDING PRACTICES: OVERALL PATTERN	39
IV.	INFANT FEEDING PRACTICES: DETAILS OF BREASTFEEDING	47
	Patterns of Breastfeeding Feeding Patterns and Postpartum Amenorrhea Feeding Practices in the Puerperium Differential Feeding of Boy and Girl Infants Breastfeeding Problems and Reasons for Weaning Hot/Cold Theories, The Cultural Context and Insufficient Milk Advice and Beliefs: Their Effects on Breastfeeding Characteristics of Women Who Never Initiated Breastfeeding	
V.	INFANT FEEDING PRACTICES: DETAILS OF SUPPLEMENTATION	95
VI.	DETERMINANTS OF INFANT FEEDING PRACTICES: BACKGROUND VARIABLES	111
VII.	DETERMINANTS OF INFANT FEEDING PRACTICES: INFANT FOODS	130
	Marketing Methodology Retail Availability Price Competitive Structure Government Regulation Medical Promotion Commercial Influences and Consumer Behavior Samples Recall of Advertising Endorsement of Formula by a Phsysician Summary	
VIII.	DETERMINANTS OF INFANT FEEDING PRACTICES: MATERNAL EMPLOYMENT	149
IX.	DETERMINANTS OF INFANT FEEDING PRACTICES: HEALTH SERVICES	175
X.	DETERMINANTS OF INFANT FEEDING PRACTICES: THE OVERALL MODEL	207
XI.	SUMMARY AND RECOMMENDATIONS	221

LIST OF TABLES

Table 2-1 Household Size
Table 2-2 Family Income
Table 2-3 Food Expenditure
Table 2-4 Income After Food Expenditure
Table 2-5 Socioeconomic Status
Table 2-6 Income Groups and SES Status
Table 2-7 Possessions and Facilities
Table 2-8 Access to Toilet and Running Water
Table 2-9 Cooking Facilities
Table 2-10 Water Storage
Table 2-11 Income by Two Socioeconomic Indicators
Table 2-12 Age of Index Mothers
Table 2-13 Schooling of Index Mothers
Table 2-14 Mother's Birthplace
Table 2-15 Length of Residence in Bogota for Migrant Women
Table 2-16 Rural-Urban Background of Immigrants
Table 2-17 Parity of Index Mothers
Table 2-18 Contraceptive Use of Index Mothers
Table 2-19 Amenorrhea at Time of Survey
Table 2-20 Time Since Birth for Amenorrheic Women (Months)
Table 2-21 Contraceptive Use and Amenorrhea
Table 2-22 Working for Income at Time of Survey
Table 2-23 Mothers Current Occupation
Table 2-24 Working at Time of Survey Compared With Working During Pregnancy
Table 2-25 Age of Child
Table 2-26 Place of Birth of Child

Table 3-1 Initiation of Breastfeeding By Sex
Table 3-2 Feeding Pattern by Age of Child

Table 4-1 "What is the best food for a child the same age as your child?"
Table 4-2 Mean Frequency of Breastfeeding By Age of Child (Breastfeeding Children)
Table 4-3 Breastfeeding Schedule
Table 4-4 Laterality of Breastfeeding
Table 4-5 Nightfeeding By Age of Child
Table 4-6 Proportion Amenorrheic by Frequency of Breastfeeding
Table 4-7 Proportion Amenorrheic by Patterns of Feeding
Table 4-8 Median Length of Breastfeeding and Amenorrhea by the Age of the Mother
Table 4-9 Median Length of Breastfeeding and Amenorrhea by Parity of Mother
Table 4-10 Feeding of Colostrum
Table 4-11 Aspects of Feeding Patterns By Sex
Table 4-12 Maternal Employment by Age of Child by Sex
Table 4-13 Reason Weaned by Sex of Child
Table 4-14 How Mother Knew Milk Was Insufficient?
Table 4-15 Reasons Milk Dried Up
Table 4-16 Contraceptive Use by Sex of Child
Table 4-17 Ways a Woman Can Produce More Breastmilk

List of Tables (cont)

Table 4-18 Reason Given for Using Non-breast Milk
Table 4-19 Reason for Not Giving Supplementary Milk
Table 4-20 When is Supplementary Milk Given by Breastfeeding Women?
Table 4-21 Weaning Interval by Age at First Bottle
Table 4-22 Mothers Receipt of Feeding Advice
Table 4-23 Source of Advice on Infant Feeding Received During Pregnancy and Postpartum
Table 4-24 Content of Advice Received During Pregnancy and Postpartum
Table 4-25 Reason for Not Initiating Breastfeeding By Sex of Child
Table 4-26 Association of Various Variables with Initiation of Breastfeeding

Table 5-1 Average Age for First Supplementation, First Bottle, and First Foods by Age of Child

Table 6-1 Initiation and Duration of Breastfeeding by Socioeconomic Factors
Table 6-2 Logistic Regression Models: Background Socioeconomic Variables
Table 6-3 Adjusted Risk Odds Ratios Background Variables as Predictors
Table 6-4 Logistic Regression Models for Background Socioeconomic Variables and Bottle by 1 Month
Table 6-5 Adjusted Risk Odds Ratios Background Variables and Bottle by One Month
Table 6-6 Logistic Regression Model for Breastfeeding to 6 months (excluding children not Breastfed to 3 months) Background and Bottle By One Month as Predictor Variables

Table 7-1 Stores Sampled in Retail Audit by Census Area
Table 7-2 Availability of Infant Foods by Type of Outlet
Table 7-3 Brand Share of Formula Volume
Table 7-4 Select Respondent Characteristics and Receipt of Sample of Infant Formula (n = 711)
Table 7-5 Select Respondent Characterisitcs and Recall of Advertising of Commercial Infant Foods (n = 711)
Table 7-6 Select Respondent Characteristics and Report of Physician Endorsement

Table 8-1 Current Employment Status of Mother
Table 8-2 Work During Pregnancy
Table 8-3 Prenatal Employment and Current Employment
Table 8-4 Maternal Employment by Parity
Table 8-5 Maternal Employment by Age
Table 8-6 Maternal Employment and Schooling
Table 8-7 Family Income by Maternal Employment
Table 8-8 Hours Per Day Away From Home
Table 8-9 Does Mother Take Child to Work
Table 8-10 Employment and Breastfeeding Duration
Table 8-11 Bottle Use by Maternal Employment
Table 8-12 Employment for Women With Infants 0-2 Months According to Bottle Use Now

List of Tables (Cont)

Table 8-13 Logistic Regression Models Socio-Economic and Maternal Employment Variables
Table 8-14 Adjusted Risk Odds Ratios Socioeconomic and Maternal Employment Variables
Table 8-15 Logistic Regression Models for Socioeconomic Variables (non-workers only)
Table 8-16 Adjusted Risk Odds Ratios Socioeconomic Variables (non workers only)
Table 8-17 " " " " " " "
Table 8-18 " " " " " " and Bottle by 1 month non-workers only
Table 8-19 workers only " " " "
Table 8-20 Adjusted Risk Odds Ratios Background Variables
Table 8-21 Logistic Regression Models Socioeconomic Variables, and Bottle by 1 month
Table 8-22 Adjusted Risk Odds Ratios

Table 9-1 Prenatal Care
Table 9-2 Location of Prenatal Care
Table 9-3 Advice on Infant Feeding During Pregnancy
Table 9-4 Who Gave Prenatal Advice
Table 9-5 Type of Advice
Table 9-6 Type of Prenatal Advice According to Source of Advice
Table 9-7 Caesarean Section
Table 9-8 Child Left Hospital With Mother
Table 9-9 Reason Child Did Not Leave Hospital With Mother
Table 9-10 Mother Received Formula Sample from Hospital
Table 9-11 Location of Infant After Birth
Table 9-12 Neonatal Advice'
Table 9-13 Source of Advice
Table 9-14 Type of Neonatal Advice
Table 9-15 Type of Neonatal Advice by Source of Advice
Table 9-16 Health Services Independent Variables by Feeding Outcomes
Table 9-17 Logistic Regression Models Socioeconomic and Health Services Variables
Table 9-18 Adjusted Risk Odds Ratio Socioeconomic and Health Services
Table 9-19 Logistic Regression Models Socioeconomic, Health Services, and Bottle by 1 Month as Predictors
Table 9-20 Adjusted Risk Odds Ratios Socioeconomic Health Services, and Bottle by 1 Months as Predictors
Table 9-21 Logistic Regression Models Socioeconomic and Health Services (non-workers)
Table 9-22 Adjusted Risk Odds Ratios Socioeconomic and Health Services Variables (non-workers)
Table 9-23 Logistic Regress Socioeconomic and Health Services Variables (Workers)
Table 9-24 Adjusted Risk Odds Ratios
Table 9-25 Logistic Regression Models Socioeconomic Health Services and Bottle by 1 Month (non-workers)
Table 9-26 Logistic Regression Models Socioeconomic, Health Services, and Bottle by 1 month as Predictors (workers)
Table 9-27 Adjusted Risk Odds Ratios Socioeconomic and Health Services and Introduction of a Bottle as Predictor

List of Tables (cont)

Table 10-1 Overall Model
Table 10-2 Adjusted Risk Odds Ratios - Overall Model
Table 10-3 Logistic Regression Overall Model Including Bottle by 1 Month
Table 10-4 Adjusted Risk Odds Ratios Overall Model Including Bottle by 1 Month
Table 10-5 Logistic Regression: Overall Model (Non Workers)
Table 10-6 Adjusted Risk Odds Ratios Overall Model (Non-workers)
Table 10-7 Logistic Regression - Overall Model (Workers)
Table 10-8 Adjusted Risk Odds Ratios - Overall Model (Workers)
Table 10-9 Logistic Regression Overall Model Including Bottle by 1 Month as a Predictor Variable
Table 10-10 Adjusted Risk Odds Ratios - Overall Model

LIST OF FIGURES

Figure 2-1 Birthplace of Mother
Figure 2-2 Last Place of Residence of Mother Before Bogota
Figure 2-3 Age and Sex of Index Children

Figure 3-1 Percentage of Children Initiating Breastfeeding
Figure 3-2 Breastfeeding Patterns
Figure 3-3 Percentage of Children Consuming Different Milk and Foods by Age of Child

Figure 4-1 Exclusive and Non-exclusive Breastfeeding by Age of Child
Figure 4-2 Duration of Breastfeeding by Last Breastfeed
Figure 4-3 Percent of Sample Breastfeeding for Various Durations
Figure 4-4 Number of Daily Breastfeeding Episodes
Figure 4-5 Number of Daily Breastfeeding Epidsodes Among Exclusively Breastfeeding Women for Children Under Six Months
Figure 4-6 Number of Daily Breastfeeding Episodes Among Non-Exclusively Breastfeeding Women

Figure 5-1 Percentages of Children Receiving Various Feeding Regimes
Figure 5-2 Pattern of Supplementation for Breastfed Children Versus Non-Breastfed Children
Figure 5-3 Percentage of Children Currently Bottle Fed and Consuming Other Foods by Age of Child
Figure 5-4 Current Use of Breastmilk Substitutes and Foods Among Ever Breastfed Children
Figure 5-5 Current Use of Breastmilk Substitute and Foods Among Currently Breastfeeding Children
Figure 5-6 Percentage of Children Receiving Varieties of Foods
Figure 5-7 Percentage of Children Consuming Different Foods

Figure 6-1 Duration of Breastfeeding by Family Income
Figure 6-2 Duration of Breastfeeding by Mother's Birthplace
Figure 6-3 Duration of Breastfeeding by Mother's Education
Figure 6-4 Duration of Breastfeeding by Mother's Age
Figure 6-5 Duration of Breastfeeding by Parity
Figure 6-6 Duration of Breastfeeding by Introduction of a Bottle by 1 month

Figure 8-1 Employed Women by Age of Child
Figure 8-2 Duration of Breastfeeding by Current Work

Figure 9-1 Duration of Breastfeeding by Location of Birth
Figure 9-2 Duration of Breastfeeding by Rooming-in
Figure 9-3 Duration of Breastfeeding by Neonatal Advice

Figure 10-1 Determinants of Infant Feeding Practices

Chapter I INTRODUCTION AND STUDY DESIGN

This report is part of a larger study that began in 1979 to explore the determinants of infant feeding practices in four developing countries. The larger study was conducted by a research consortium of The Population Council, Columbia University, and Cornell University in collaboration with investigators in each field site. The Bogota study was implemented by the Faculty of Interdisciplinary Studies, Javeriana University. In addition to Bogota, data were collected in Bangkok, Thailand; Nairobi, Kenya; and Semarang, Indonesia. The institutions representing the other 3 sites are the Faculty of Public Health, Mahidol University, Bangkok; Central Bureau of Statistics (CBS) and African Medical and Research Foundation (AMREF), Nairobi; and Diponegoro University, Semarang.

The central objective of the study was to investigate the significance of a broad range of biological, social, cultural and economic factors on infant feeding practices in order to determine the nature and magnitude of their contribution to problems of infant nutrition. These variables included the role of the health professions, infant food marketing and distribution strategies, and women's labor force participation. An interdisciplinary research approach has been utilized in order to identify a variety of potential influences on infant feeding decisions and choices.

This approach includes 3 study components: 1) ethnographic field work, consisting of Phase I: participant observation of infant feeding practices in the home and, Phase II: similar observations in health services settings; 2) a cross-sectional household survey of mothers of infants under one year of age which includes infant feeding practices and consumer behavior relating to infant foods, 3) a market study, on a national basis, of the infant feeding market, including the analysis of the development and state of the industry and the structure of the market. The research has been guided by the conceptual framework developed by staff and consultants in early 1981[1].

---

[1]The conceptual framework was endorsed by AID's Project Review Panel in April 1981 and has been distributed as a Population Council International Programs Working Paper: Laukaran, V.H., E.K. Kellner, B. Winikoff, G. Solimano, M. Latham, P. Van Esterik and J. Post. "Research on Determinants of Infant Feeding Practices: A Conceptual Framework," November 1981; Working Paper No. 15.

Ethnography: Methods and Site Description

Sample Selection

The purpose of this component of the research is to identify and analyze key socio-cultural and economic factors related with infant feeding. In Bogota, the community studies were carried out in three low and middle income sectors in the southeast (sector 1), west (sector 2), and northwest (sector 3) of the city.

The areas of study were selected on the basis of social risk indicators. Two neighborhoods with a high percentage of low and low middle income workers in the informal sector, and where there were high infant mortality rates were chosen (sectors one and three). Sector two was selected as an area with a higher percentage of low middle and middle income families, based on the latest household survey of DANE (National Department of Statistics). The sectors do not correspond to exact political and administrative divisions within the city. Additional considerations included the safety of the area for the ethnographers and access to transportation.

Within these three sectors, thirty households were chosen for intensive study. Ten households with infants under one year of age in each community were asked to participate in the ethnographic component. Households were often chosen on the advice of personnel at the Catholic Church, the Health Center, The Community Center, or the local shops. The fieldworkers developed two or three cases at a time, trying to fit visits around the work schedules and other priorities of the mothers. In each community, the ethnographers tried to obtain a balance between households with older and younger infants, and households with differing migration patterns. Extra care was taken to include mothers working outside the home in the sample.

Personnel

Fieldwork was done by two trained anthropologists working together in one neighborhood at a time under the supervision of a senior anthropologist. The senior anthropologist conducted the training program stressing formal and informal interviewing techniques, participant observation, life histories, food intake data, kinship and techniques for writing and analyzing field notes.

In Colombia, the research team was small, and the staff members were in constant contact with each other. The team met

as a whole every week to outline progress on each topic. Thus, the survey questions were constructed based on information emerging from the ethnography and subsequently tested among the same informants. Survey and marketing teams reviewed the preliminary fieldnotes produced by the ethnographers every week.

The success of the ethnographic component was largely due to the very good relations the ethnographers developed with the case study mothers and community workers.

Data Collection

Before fieldwork began, the ethnographic team conducted secondary research on low income families in Bogota. Next, they produced a Spanish field manual based on the Consortium guidelines and used this as the basis for their training sessions.

The Colombia investigators interpreted Phase I and Phase II of the ethnographic study in a different way from other site investigators. They approached the ethnographic portion in a holistic manner, interviewing, observing and collecting data in the community and later returning for in-depth interviews with the women. Thus, the methods and objectives of both phases of ethnography were, in the overall, treated as one study report.

The ethnographic team recorded information on the following topics through participant observation and informal interviewing to develop a broad picture of each community:

1) Physical description of neighborhoods
   - types of housing
   - availability of electricity, water, sewage system, garbage disposal

2) Demography
   - neighborhood census

3) Economic conditions
   - labor force
   - local industries
   - businesses, supermarkets and pharmacies
   - prices of important food stuffs

4) Socio-cultural dimensions
   - family organization
   - folk medicine, magic and religion
   - institutions related to health and nutrition sector

Following the community study, the ethnographers began an in-depth analysis of ten households, concentrating on the following topics:

1) Physical conditions in the home

2) Social and economic characteristics of the household
   - kinship
   - migration
   - life history of mother
   - income and budget

3) Infant feeding and childcare
   - direct observation of food preparation and child feeding
   - feeding history of the infant
   - reasons for changing infant feeding patterns
   - reasons for weaning
   - reasons for using breastmilk substitute
   - explanations of insufficient milk
   - grandmothers' feeding patterns

4) Personal, professional and institutional influences
   - advice and opinions about infant feeding
   - influence of father, grandmother, kin, friends, on infant feeding

5) Mothers' activities
   - activities and schedules of mothers inside and outside the home
   - childcare arrangements

6) Consumer behavior
   - feeding history child
   - commercial foodstuffs bought

Information on each topic was obtained through direct observation, daily activity recall, life history, and informal interviewing.

In addition, the team used photographs and sketch maps to describe the communities and standard kinship diagrams to analyze the social organization of the families. Life histories of the mothers provided information on migration and labor history. Following completion of the ethnographic fieldwork, the nutritionist for the study visited each mother and made a nutritional evaluation of each child in the study. These data and pictures of the children were given to the mothers as gestures of appreciation from the study team.

The Community Context: Bogota

The city of Bogota differs substantially from the other three sites chosen for the Infant Feeding Practices Study. From a population of 21,000 in the 19th century, Bogota has now become the fifth largest city in Latin America, with a population of over four million.

Around 1938, the Colombian population was about 70% rural and 30% urban. Political and economic changes in the country in the following decades, however, resulted in major shifts in the distribution of the population. The cities were forced to absorb large numbers of rural migrants until, by the mid seventies, 60% of the population resided in urban areas.

The growth of Bogota was so rapid that the city became incapable of meeting the growing demand for jobs and providing the migrant population with adequate public services such as clean water, transportation, housing and sewage disposal. The deteriorating conditions in the areas where migrants and low income families live is reflected in the morbidity and mortality rates for children younger than five years of age. The communities chosen for more intensive study in the ethnography exhibit many of the characteristics of these poverty belts around the periphery of Bogota. Much of the migration is from urban and town areas, not directly from rural communities.

As in the poorest households in Bangkok, Nairobi, and Semarang, poor mothers in Bogota spend much of their time struggling to obtain scarce and expensive resources. Lining up for gas, water and food, mothers have difficulty combining household and income generating activities. They spend well over half their income for food.

In many areas, the lack of public facilities was obvious, as the growing population required more health and nutrition services than could be provided. Crowded and expensive health facilities encouraged mothers to use the drug stores and urban curanderos as providers of health services.

Sector 1: Southeast

The area southeast of Bogota contains about 100,000 inhabitants, mostly migrants to Bogota within the past thirty years. The neighborhoods of Juan Rey, La Peninsula, Guacamayas, La Gloria, La Victoria, Altamira, and El Rodeo all are characterized by high growth rates and insufficient public services for electricity, water, sewage, and garbage collection. Although

health care services are available, there are not enough to meet the demand, and the inhabitants make substantial use of the informal health services in the area. Mothers complained that they were not treated well in the Health Centers, and that the hours and treatments were not suitable for their needs.

This is a low income area with high unemployment and irregular opportunities in the informal labor force. Many women in the area work in domestic service, in very small businesses, or work at home. Emergency cash is obtained by pawning the few household objects.

These neighborhoods grew up as squatter settlements and are technically illegal. The ramshackle houses often shelter several families (inquilinos). Particularly in the rainy season, the shacks were very difficult to reach. One family of 13 in the study erected their own shack of boards with a tin roof, no windows and an earth floor of 14 square meters.

The anthropologists began meeting mothers through the assistance of the Director of the Juvenile Community Center of La Victoria, who introduced mothers who made use of community services such as the employment center. These services are important to mothers in the community, although the services do not reach all they could. In the opinion of these mothers, infant feeding practices have deteriorated in the community; even older siblings were fed better than younger siblings in the same family. The case studies illustrate the problems these mother faced in keeping their children alive and adequately fed.

Sector 2: West

In the communities of Boyaca Real, San Marcos, Villa Lug, La Clarita, and Santa Helenita, the residents have access to a full range of public services including paved streets. In the past, this was an important agricultural and cattle area, but in the last thirty years it has become completely urbanized with migrants from other towns in Colombia. The population of this area is approximately 417,000. There are no significant health and nutrition services in the area, although the Catholic Church provides a number of services. Contact with local households was made through the assistance of the parishes.

This is an area of middle and low middle income households with employment in both the formal and informal sector and less unemployment than in sector one. Many inhabitants work in the business and commercial district in the area. Some are homeowners and others pay rent. There are fewer working mothers

here, and those who do work often do so from their homes. Social mobility is possible in this area through education.

In general, the inhabitants of sector two have better living conditions and more money available to spend on food. They spend about 50% of their incomes on food, and although they could afford more commercial infant foods, they generally prefer to use home made supplements. The families in this sector usually have fewer children to feed compared to families in the other two sectors.

Sector 3: Northwest

The area of Tibabuyes is substantially smaller than sector two and has an estimated population of 200,000 inhabitants. The area was settled by more recent migrants and can still be considered a semi-urban area with stretches of flower plantations and dairy cattle. Like sector one, this area still does not have paved streets or sufficient public services and health care facilities. However, there is a community organization which provides public services.

Like sector one, this is an area of low income households with high unemployment. The available work is largely in the informal sector, with many women employed as domestic servants. The women in the community complain about the lack of health care facilities in the area and rely heavily on other forms of advice, particularly from drug stores. In spite of the lack of income in these households, there is a significant use of commercial infant foods. This may reflect the lessened contact with grandparents in sector three households.

These three communities are broadly representative of low and middle income families in Bogota. Sectors one and three share the precarious living conditions of low income households. Sector one families face the additional problem of living in the mountainous foothills where weather conditions confound the problem of inadequate housing. Not surprisingly, the children from sector one have the poorest nutritional status of all sectors.

Survey Methods

Sample Selection

The survey component of the Infant Feeding Study was designed to investigate the role of a broad range of factors as determinants of infant feeding practices. These factors included, among others, women's employment, health service, and demographic variables. For each of these analyses it would be possible to design a special study to investigate their effects on infant feeding practices, and the sampling strategies, in all probability, would vary according to the purpose of the analysis. Because of the broad scope of this study, however, and the need for descriptive information to formulate policies to improve infant feeding practices, it was decided, in consultation with sampling experts from the Consortium, to use representative cluster samples of each city.

The National Statistics Department (DANE) in Bogota maintains a representative probability sample of the city, which was used as the sampling frame for the study. In consultation with representatives of the Consortium and DANE, a sample was drawn with a desired size of 900. A multi-stage cluster sample was used to select 600 blocks in 120 census sections on an equal probability basis. A sampling fraction within each block was selected based on the size of the block, and 5-13 households per block were surveyed. Interviews were conducted in homes with mothers of children under 12 months of age. Where there was more than one eligible child in the household, one was chosen at random. The upper and upper-middle sectors were excluded because the most wealthy residents in Colombia are concentrated in the city of Bogota and enjoy a standard of living far above that of the population as a whole. It was thought inadvisable to use study resources on these groups.

Instrument Development

The Research Consortium developed a model instrument for all study sites which included information on households, index mothers, and children under 12 months. The basis for the selection of these variables was described in a working paper by the Consortium (Laukaran, et al., 1981). Key variables to be included in the instrument for each household were: income, water supply, electricity, sanitation, refrigeration, number of persons

in household, and recency of urban migration. Information for each index mother included age, number of live births, number of years of education, and employment of the male head of the household.

For each child, information was included on sex, date of birth, age, birth order, place of birth, hospitalization and morbidity in the last two weeks, as well as height and weight. The key variables included in the infant feeding data were as follows:

- ever breastfed
- currently receiving breast milk
- currently receiving nonhuman milk
- currently receiving infant formula
- currently receiving other foods
- duration of exclusive breastfeeding
- age at introduction of non-human milk
- age at cessation of non-human milk
- age at introduction of infant formula
- age at introduction of other foods
- type of other foods given

Other information included in the questionnaires consisted of consumer behavior information, prenatal care and maternity care, and detailed information on the mother's employment, on knowledge and attitudes about breastfeeding, and determinants of weaning and bottle feeding. A draft instrument was prepared for use in Bogota based on the core instrument developed by the Consortium and drawing heavily on the results of ethnographic field work. Technical assistance was provided by the Consortium for the revision of this instrument after a pretest of the draft instrument. Revisions were incorporated, and the final instrument was approved by the Consortium before being used in the field.

Training

Sixteen interviewers and two supervisors were trained in a five-day session which included field exercises in use of the survey instrument and training in anthropometric techniques.

Field Work

Interviewing took place from 10/26/81 to 12/15/81. The principal investigators at Javeriana University maintained quality control by frequent field visits and monitoring and field editing the incoming data. For each household in the selected blocks where there was a child up to 12 months of age, a questionnaire was completed. If the mother or principal guardian could not be found at home, an interviewer returned to the home in the evening. The final sample size was 711, somewhat less than the desired sample of 900. No effort was made to augment the final sample.

Data Analysis

The data were coded, edited, and cleaned in-country using the computing facilities of Javeriana University . The clean data tapes were delivered to Consortium staff at The Population Council in New York, and final data analyses were prepared on the Council's DEC PDP-11/73 computer. For logistic regression analysis, the Princeton University Computing Center was used to enable the application of SAS programs.

Chapter II CHARACTERISTICS OF THE STUDY POPULATION

Households

Before describing trends and variations in breastfeeding and infant care practices among women in the Bogota sample, it is important to consider salient demographic characteristics of the family, the index mother and infant. This will provide the context for the detailed statistical and ethnographic descriptions of maternal belief systems and practices to be presented in the following sections. These analyses are based on the 711 valid cases which form the Bogota survey data set.[1] The inhabitants, thus, the respondents, in sector I (located in the higher geographic area, southeast of Bogota, adjacent to the mountains) and sector III (located in the plains northwest of Bogota) have a similar socioeconomic profile: They are poor, suffer from high rates of unemployment with few economic resources and have a high, continuously rising population density. Overcrowding is a serious problem for people living in these two sectors. In comparison, sector II (located near the main and newest avenues and highways west of Bogota) has a more stratified populace, including middle, lower middle and lower class residents. Thus, the majority of the ethnographer's case study respondents in this sector owned their own homes and had correspondingly adequate sanitary facilities. They participated more often in the formal labor force as compared with the informal jobs held by many of the residents in the other two sectors.

Most mothers in the Bogota study live in a household of 3-5 people; more than three-quarters of the households have six or fewer members (Table 2-1). The median aggregate monthly family income (Table 2-2) is 10,000 pesos --- the equivalent of US $185 at the time of the survey. (At the time of the survey, the exchange rate was 54 pesos = US$1.00. In December, 1985, 156 pesos = US $1.00). Forty-one percent of the index families have incomes of less than 10,000 pesos per month. Since the time of the survey, the Colombian peso underwent a severe devaluation. Devaluations affect the price of imported goods, such as foreign produced infant formulas. This should be kept in mind when considering the financial burden such purchases impose upon poor families, especially where increases in income have not offset the effects of devaluation.

---

[1]All calculations involving data of last breastfeeding are based on 204 valid cased out of the 300 women no longer breastfeeding, as data were missing for 94 of these women.

These gross income figures may be misleading, however, since aggregate figures may not represent income which is consistently available to meet a family's monthly expenses. For example, as the ethnographers describe for one family...

> "...The father in this family works as an employee in a gas station and earns more or less 6,000 pesos a month. He contributes 1,000 pesos towards groceries, spends 1,000 pesos on drinking and the rest he keeps to himself. His wife works in the house making ceramic dolls and earns 2,200 pesos a month. They pay 2,000 pesos in rent monthly."

The reality is that this family has an available income per month of 3,200 pesos, 1,200 of which must cover fuel, transportation, services, food, clothing, medicine, and so on, after the rent is paid.

The cross-sectional data show that half of the 2 person (mother and her child) households have monthly incomes of less than 6,000 pesos per month. Predictably, women without husbands are among the poorest families in the sample. According to the Colombian ethnographers, 16% of the women in the case studies were heads-of-household. There appears to be an increasing tendency in Bogota for women to be the main source of financial support of their families. This phenomenon can be attributed to a number of economic factors, including rising unemployment of men, as well as under-employment of husbands and a consequent abandonment of women and children. Such a trend may well prove to be a significant social welfare issue. The possible ramifications for maternal behavior will be explored in later sections of this report.

A more accurate representation of household wealth is disposable income after food expenses are deducted. Table 2-3 presents the distribution of monthly food expenditures per month. When food expenses are deducted from monthly income, (Table 2-4), 54% of the households in the sample have less than 5,000 pesos per month available for other necessities of life. What is more startling is that 11% of the population has but a few pesos remaining for this purpose. In general, poorer people spend a greater proportion of their income on food purchases. These Bogota families are no exception. In fact, in a report by the Colombian investigators analyzing the survey data[2], it was found that poor and lower class people in the sample spent 72% and 59% (respectively) of their monthly income on food as compared with

---

[2]Table 1 Page 3A in B. S. de Paredes et al, Javeriana University, "Infant Feeding Practices among Low and Middle Income Families," A Report to the Population Council, December 1982.

lower-middle and middle class families who spent 50% and 45%, respectively.

Again, just as gross monthly income figures should be considered only first approximations, so should disposable resources. It is difficult to establish the amount of expenditures on food by Bogota mothers because many purchases are bought on credit, creating a difficult situation for families with unstable finances. The burden of repayment is both current and future, but the tragedy is in the day-to-day insecurity of a mother who is dependent upon a creditor to feed her children. Later in this report, the high proportion of income (whether cash or credit) spent by poor and lower class women on food will be discussed further.

Before presenting other indicators of socioeconomic status, Table 2-5 gives the distribution of sample households according to a classification utilized by the Colombian research team at Javeriana University. This categorization was based on the DANE classification system where type of housing construction, access to public services, degree of crowding and family income provided a combination of variables used to stratify the population sample. Based on these variables, 5% of the sample households were poor or defined as having low/low socioeconomic status, 33% were lower class, 53% were low-middle and 10.3% were from middle class households.

We assume that the corresponding income levels for the four SES categories would be roughly as follows (Table 2-6): (1) low/low poor is less than 6000 pesos per month; (2) low status indicates income under 15000, (57% receive less than 9,800 pesos per month); (3) low middle is between 15000 and 25000 pesos per month; (4) middle class families are mostly in the 25,000-60,000+ income group. These are considered approximate representations of incomes. There are some families in all status/class groups whose incomes are between Lo-24000. This underscores the crucial factor that SES refers to a standard of living and not merely stated earnings, and more importantly, that many families in our sample who indicate higher incomes, are, in fact, living in sub-standard environmental conditions.

Tables 2-7 through 2-9 present more refined indicators of the socioeconomic status of our sample. At first glance, the aggregate answers to the survey questions lead one to assume that a large proportion of the households have access to running water (96%), electricity (97%) and a toilet (92%) (Table 2-7). A more careful examination (Table 2-8), however, shows greater variability in kinds of facilities. Forty-six percent of the sample live in a boarding house-type dwelling and share <u>both</u> toilets and running water with other families. Five percent have no facilities whatsoever!

The sub-standard conditions for nine families who live in a boarding house-type dwelling in Sector I is described by the ethnographers...

> "...Water is purchased in the neighborhood at 160 pesos a month and is brought from where they purchased it in a tank...in rooms laid out side by side in a dark corridor, nine families are living and sharing three kitchens, a single bathroom and a sink. In this rental space 34 people are living..."

There is also variation in cooking facilities, with 30% using a gas oven or stove; another 26% a kerosene or alcohol stove; 23% a gasoline stove or heater; 15% electric stoves, and, finally 6% use coal, wood, or other less desirable combustibles (Table 2-9). One cannot assume from the statistics on water use that most people in the sample households have a constant supply of clean water. Water that is purchased, taken from a stream or a well may or may not be clean. A real problem for those families (46%) who share water faucets is the cleanliness of the receptacle used to transport and store water. Twenty-one percent of the families stated they stored water in buckets, pots, pails, large cans or drums -- containers that are easily contaminated (Table 2-10).

Finally, less than one-third of the cohort own a refrigerator. In contrast to electricity, which is widely available in all income groups, the prevalence of refrigeration is clearly and systematically related to income (Table 2-11). Eighty-five percent of all refrigerator owners were from households with a monthly income of more than 9801 pesos per month. Aside from other important contributions to health, and quality of life, refrigeration and access to uncontaminated water are necessary for safe bottle feeding of infants. The low household prevalence of the former and the questionable cleanliness of the latter for families with shared or no facilities suggests a high probability of suboptimal health conditions for many infants receiving bottle milks.

Index Mothers

Table 2-12 indicates most mothers in the survey are 20-29 years old (60.8%). Approximately 15% of the index mothers are teenage parents and less than 10% are over 35, with a median age of 24 years. More than half of the index mothers have completed less than 8 years of education, and twenty-three percent have 4 or less years of school (Table 2-13). Only 3.3% have completed 13 or more years of education.

A pattern of migration from rural to urban and from small urban to large metropolitan areas has been generally character-

istic of Latin America in the past few decades. This sample of Colombian mothers is no exception. Almost two-thirds have migrated to Bogota (Table 2-14), although few are extremely recent migrants. Table 2-15 shows the length of residence for migrants to the city of Bogota. Almost 45% of the women have lived in Bogota for more than 10 years. Only 4% have moved to Bogota within the last year. From Table 2-16 one can see that, while most migrants to Bogota were born in urban settings, more than 3/4 of index mothers who were born in rural areas moved directly from a rural area to urban Bogota. Fifty-one percent of all index mothers born outside Bogota were urban-born and last resided in an urban area.

The two maps (Figures 2-1 and 2-2) illustrate the frequency distribution of mother's birthplace and last residence of index mothers' not born in Bogota. The vast majority were born and last resided in the highland provinces of Colombia surrounding Bogota. Very few came from the Pacific or Caribbean coastal provinces and almost none from the lower side of the Colombian cordillera.

Over eighty percent of the sampled women have three or fewer children (Table 2-17). Fifty-eight percent are not using any contraceptive technique (Table 2-18), of those who are: 32% utilize pills; 27% an IUD; and 9% were sterilized. A little more than one third of the sample was still experiencing amenorrhea at the time of the survey (Table 2-19). Sixty percent of these amenorrheic women were three months or less post-partum (Table 2-20), and most of the sample women with children 4 or more months of age had experienced return of menses. The effect of breastfeeding in producing amenorrhea is well recognized and varies with frequency and duration of breastfeeding and with use of supplements. This issue will be elaborated in a subsequent section on breastfeeding duration and frequency of supplementation among the Bogota women. It is interesting to note that 21% of the women who report experiencing amenorrhea at the time of the survey are also using a contraceptive technique (Table 2-21). Ten of those 52 women had been sterilized; the remainder used non-permanent contraceptives. None of the reported reversible contraceptives causes amenorrhea, so the apparent overlap in protection is not spurious for these 42 women.

The behavior of many of the women (particularly those in sector I) interviewed in the in-depth ethnographic study, indicates a conscious desire to limit the number of children in their families. In addition to the reported use of modern methods, traditional methods to ensure against conception were described, including (1) drinking the shavings from the skull of a black mare in boiling water every day for nine days (corresponding to each month of pregnancy) immediately after childbirth and (2) burying the placenta with a kilo of salt

wrapped in a newspaper outside the doorway. The ethnographers documented opposition to the use of contraceptives by husbands, however, despite the often dire economic situations of the families. One woman stated that her husband refused to authorize a tubal ligation because he had heard it lead to "women abandoning the home." The inconvenience of some contraceptives and the cultural prestige accorded to men who father many children undoubtedly contribute to the men's rejection of their wives' family planning wishes. Clearly, fathers are important in decisions about family planning, and they also (see below) exert a good deal of influence over a number of infant feeding practices, including the use of substitute milks, and decisions to terminate breastfeeding.

Since control over household decisions appears critical for many of these families, the question of control over income within a household assumes great importance. The ethnographers suggest that working women have control over their own income and generally use it to supplement food purchases, either because their husbands' incomes are inadequate or because the women receive only a small portion of it to buy food. The major portion of husbands earnings are often kept by the husband for his own purposes. Table 2-22 shows that only 25% of the sample mothers were working for income at the time of the survey as compared with 36% (253 women) who stated they had been employed during their pregnancy.

Table 2-23 presents the distribution of women's current occupations. In Colombia, occupations are classified as informal or formal depending upon whether they are covered by national labor legislation which stipulates minimum wages and benefits such as maternity leave. Service occupations are generally unregulated whereas commerce and industry are covered by labor laws. Employed women in our sample fall roughly equally into the formal and informal sectors of the Colombian economy. The most common occupation (31%) is domestic service. Most of the women working at the time of the survey also worked during pregnancy (77%), although 23% did not work during pregnancy but were working when interviewed (Table 2-24). More details about the work of these women are presented in the Maternal Employment section, below.

Index Children

The characteristics of the index children in the sample are presented in Tables 2-25 and 2-26. Pictorially, they are represented in Figure 2-3. There are almost commensurate numbers of boys and girls with fairly equal distributions over the first 12 months of life. The slight excess of children in the very

earliest months of life may indicate less mobility for their mothers and a greater likelihood that they would be found at home and available for interview. The median age of the sample is 5 months. Table 2-26 indicates that almost 90% of the cohort children were born in a hospital. The remainder were born either at home or at the home of a midwife. A full discussion of birth experience as well as health services provided to the children and their mothers is presented in the Health Services section of this report (Chapter IX). A little over five percent of the sample were hospitalized sometime in the first year following birth and 37.4% reported an illness in the two weeks previous to the survey.

Table 2-1 Household Size

Size	(N)	%
2	8	1.1
3	133	18.7
4	162	22.8
5	132	18.6
6	88	12.4
7	56	7.9
8	37	5.2
9	37	5.2
10	21	3.0
11	15	2.1
12-15	22	3.0
Total	711	100%

Median 4.9

Table 2-2 Family Income

Pesos/Month	(N)	%
1300-6000	133	20.4
6001-9800	132	20.2
9801-14900	164	25.1
14901-29000	151	23.1
29001-60000	73	11.2
Total	653*	100.0

Median 10000 pesos -
(55 pesos = $1.00 at time of survey,
156 pesos = $1.00 1985)

*Valid cases

Table 2-3 Food Expenditure

Pesos/Month	(N)	%
10-4999	179	27.9
5000-9999	299	46.6
10000-14999	90	14.0
15000-19999	44	6.8
20000-Hi	30	4.7
Total	642	100.0%

Table 2-4 Income After Food Expenditure

Pesos/Month	(N)	%
Lo-999	66	10.7
1000-4999	267	43.5
5000-9999	147	23.9
10000-14999	54	8.8
15000-19999	20	3.3
20000-24999	19	3.1
25000-29999	14	2.3
30000-Hi	27	4.4
Total	614	100.0%

Table 2-5 Socioeconomic Status

Status*	(N)	%
Low/Low	32	4.5
Low	232	32.6
Low-middle	374	52.6
Middle	73	10.3
Total	711	100.0

*Based on DANE classification system.

Table 2-6 Income Groups and SES Status

	1300-6000 (pesos per month)		6001-9800		9801-14900		14901-29000		29000-60000+	
	N	%	N	%	N	%	N	%	N	%
Low-Low	12	9.0	3	2.3	11	6.7	2	1.3	-	-
Low	67	50.4	65	49.2	46	28.0	31	20.5	4	5.5
Low-Middle	48	36.1	58	43.[illegible]	59	8	91	60.3	49	67.1
Middle	6	4.5	6	4.5	9	5.5	27	17.9	20	27.4
		100		100		100		100		
Total	133	18.7	132	18.6	164	23.1	151	21.2	73	10.3

Table 2-7 Possessions and Facilities

	(N)	% *
Running water	630	96
Electricity	683	97
Toilet	645	92
Refrigerator	211	31

* Percentage of those answering this question

Table 2-8 Access to Toilets and Running Water

Type	(N)	%
Apartment or room with shared facilities (Boarding House)	321	45.9
House with own facilities (single family dwelling)	236	33.7
Independent apartment with own facilities	105	15.0
Hut, shack, or camp without facilities	38	5.4
Total	700	100.0%

Table 2-9 Cooking Facilities

Type	(N)	%
Gas oven or stove	213	30.3
Kerosene or alcohol stove	183	26.0
Gasoline stove or heater	164	23.3
Electricity	104	14.8
Coal or Wood	8	1.2
Other	31	4.4
Total	703	100%

Table 2-10 Water Storage

	(N)	(%)
Tank	231	33.2
Reservoir	205	29.5
Directly from aqueduct	108	15.5
Bucket, pot, pails	92	13.2
Large can/drums	19	2.7
Other receptacles	32	4.6
Not stored	9	1.3
Total	696	100.0

Table 2-11 Income by Two Socioeconomic Indicators

Monthly Income	Owns Refrig-erator (N)	%	Has Elec-tricity (N)	%
1300-6000 pesos	16	12.3	123	93.2
6000-9800	13	10.3	128	97.0
9801-14000	39	24.4	159	98.1
14001-29000	70	47.0	149	97.3
29000+	55	76.4	73	100.0
Total	193	30.3	632	97.4

Table 2-12 Age of Index Mothers

Age	(N)	%
12-17	27	3.9
18-19	74	10.6
20-24	253	36.1
25-29	173	24.7
30-34	111	15.9
35-39	43	6.1
40-	19	2.7
Total	700	100.0%

Median: 24 years

Table 2-13 Schooling of Index Mothers

Years of School Completed	N	%
None	16	2.3
1 - 4	148	21.2
5 - 7	264	37.7
8 - 10	161	23.0
11 - 12	87	12.5
13+	23	3.3
Total	699	100.0

Table 2-14 Mother's Birthplace

	N	%
Born in Bogota	247	36.0
Immigrant to Bogota	439	64.0
Total	686	100.0 %

Table 2-15 Length of Residence in Bogota for Migrant Women

Years	N	%
Less than 1 year	17	3.9
1 - 5	115	26.2
6 - 10	115	26.2
11 - 15	90	20.5
16 - 20	59	13.4
More than 20 years	43	9.8
Total	439	100.0%

Table 2-16 Rural-Urban Background of Immigrants

		Previous residence of Mother was		
		Rural	Urban	
Rural Birth	N	155	45	200
	Total %	35.5%	10.3%	45.8%
Urban Birth	N	13	224	237
	Total %	3.0%	51.2%	54.2%
	N	168	269	437
	Total %	38.4%	61.6%	100.0%

Table 2-17 Parity of Index Mothers

No. of Children	N	%
1	265	38.1
2 - 3	321	46.1
4 - 5	89	12.8
6 - 7	16	2.3
8+	5	0.7
Total	696	100.0%

Table 2-18 Contraceptive Use of Index Mothers

Contraceptive Technique	N	%
None	408	57.5
Pill	97	13.7
IUD	83	11.7
Female sterilization	34	4.8
Vaginal method (foams, etc.)	30	4.2
Injection	19	2.7
Condom	15	2.2
Rhythm	10	1.4
Withdrawal	1	0.1
Other	12	1.7
Total	709	100.0%

Table 2-19 Amenorrhea at Time of Survey

	N	%
No	423	62.8
Yes	251	37.2
Total	674	100.0%

Table 2-20 Time Since Birth for Amenorrheic Women (Months)

Month Post-Partum	(N)	%
0 (Under 30 days)	11	3
1 month	134	32
2	109	26
3	77	18
4	32	8
5	15	3
6	25	6
7	9	2
8	6	1
9	1	0
10	3	1
11	1	0
Total	423	100

Table 2-21 Contraceptive Use and Amenorrhea

Contraceptives	Ammenorrhea			
	No	%	Yes	%
No	183	43.3	199	79.3
Yes	240	56.7	52	20.7
Total	423		251	

Table 2-22 Working for Income at Time of Survey

	(N)	%
Yes	175	25
No	525	75
Total	700	100

Table 2-23 Mothers Current Occupation

Occupation	N	%
Domestic service	55	31
Factory operator	27	15
Secretary, typist	16	9
Teacher, instructor	14	8
Saleswoman	9	5
Dressmaker	8	5
Store owner	4	2
Accountant	4	2
Nurse auxiliary	4	2
Chambermaid	3	2
Auxiliary helper	3	2
Works Independently	3	1
Cashier	3	1
Construction Worker	3	1
Peddlar	2	1
Artisan	2	1
Administrator	2	1
Engraver	2	1
Receptionist, office clerk	1	1
Social worker	1	1
Custodian	1	1
Anthropologist	1	1
Lawyer	1	1
Cosmetologist	1	1
Ticket seller	1	1
Typesetter	1	1
Bookkeeper	1	1
Supervisor	1	1
Policeman	1	1
Total	175	100

Table 2-24 Working at Time of Survey Compared With Working During Pregnancy

		WORK AT TIME OF SURVEY					
		Yes		No		Total	
		n	%	n	%	n	%
Work During Pregnancy	Yes	135	19.3	118	16.9	253	36.2
	No	40	5.7	406	58.1	446	63.8
	Total	175	25%	524	75%	699	100%

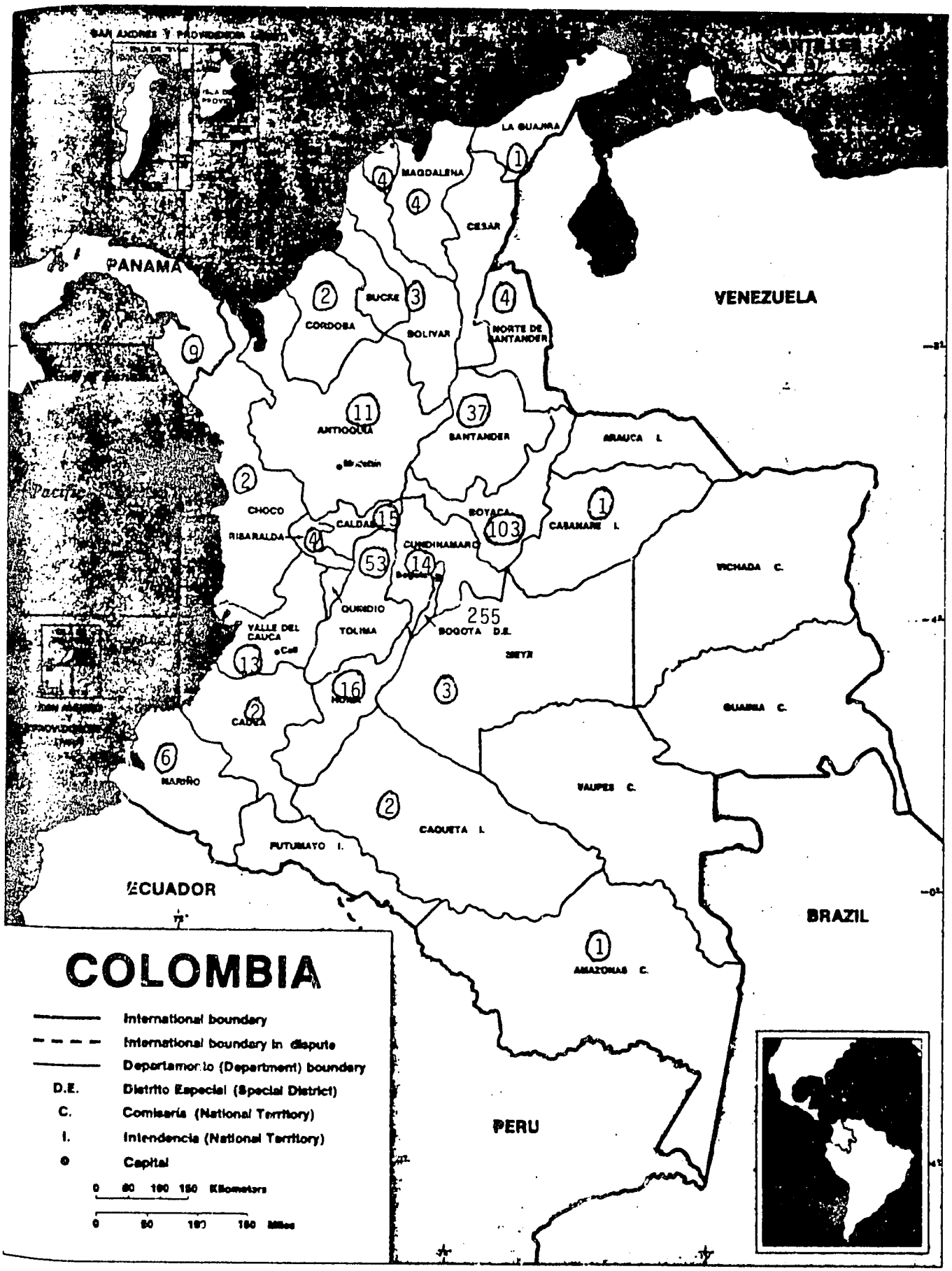
Table 2-25 Age of Child

	Male		Female		Both	
Months	N	%	N	%	N	%
Less than 1	35	10.1	42	11.6	77	10.8
1 month	36	10.3	32	8.8	68	9.6
2 month	37	10.6	36	9.9	73	10.3
3 month	27	7.8	35	9.6	62	8.7
4 month	29	8.3	27	7.4	56	7.9
5 month	29	8.3	31	8.5	60	8.4
6 month	34	9.8	28	7.7	62	8.7
7 month	22	6.3	23	6.3	45	6.3
8 month	19	5.5	26	7.2	45	6.3
9 month	22	6.3	31	8.5	53	7.5
10 month	28	8.0	25	6.9	53	7.5
11 month	30	8.6	26	7.2	56	7.9
12 month	0	0.0	1	0.3	1	0.1
Totals	348	100.0%	363	100.0%	711	100.0%

Table 2-26 Place of Birth of Child

	N	%
Public hospital	332	47.7
Social Security hospital	163	23.4
Private hospital	128	18.4
Home or other	73	10.5
Total	696	100.0%

Figure 2-1
Birthplace of Mother



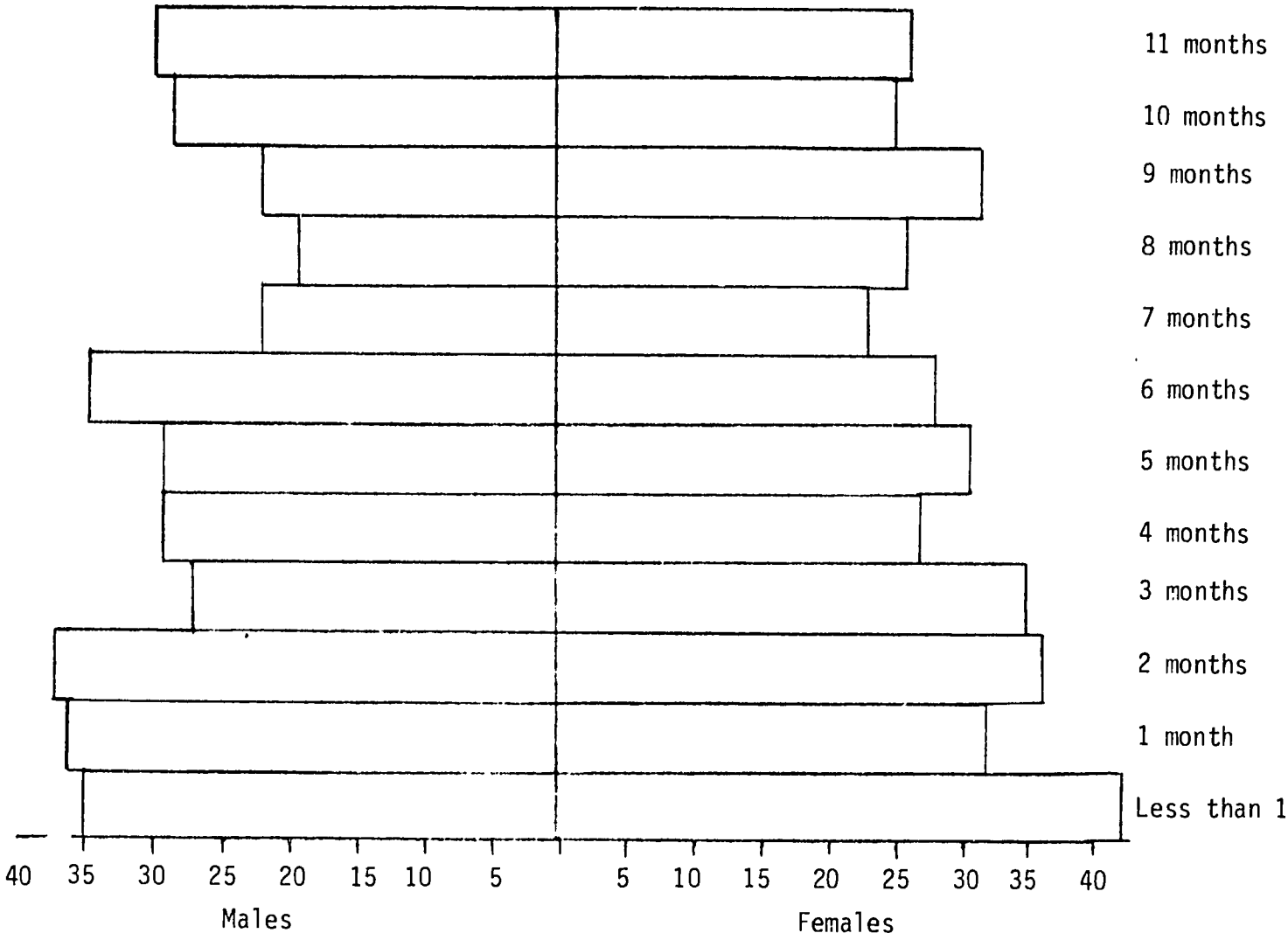
n = number of index mothers born in various geographical districts

Figure 2-2
Last Place of Residence of Mother Before Bogota

n = number of women reporting last residence in districts outside of Bogota

Figure 2-3

Age and Sex of Index Children



Chapter III INFANT FEEDING PATTERNS: OVERALL PATTERNS

This section identifies and describes the predominant infant feeding patterns among the cohort of Bogota mothers. The major characteristics are: (1) a high percentage of women initiate breastfeeding; and (2) there is a rapid introduction of a wide variety of supplements very early in infancy.

Figure 3-1 demonstrates that 97% of the babies in this survey had been breastfed at some time. Moreover, initiation of breastfeeding for male and female infants shows no significant difference (Table 3-1). The ethnographers have documented this near-universal norm for breastfeeding in the first few months of life. For example, according to one mother in Sector I:

> "...at three months of age it is good to begin to feed children other things besides breastmilk. Before that time they should be only breastfed, otherwise they catch cold and become potbellied."

Here we have a brief but graphic illustration of intuitive knowledge that breastmilk provides protection against illness and malnutrition early in the life of the infant.

Figure 3-2 presents the percentages of children who are currently breastfeeding, those who are exclusively breastfeeding with no supplements, those who were breastfed but stopped, and those who never breastfed all according to the age of the child at the time of the survey. This figure confirms what was described above, that most children initiate breastfeeding and, as a result, the percentage of children who have never breastfed is in the 3% range for all ages.

The number who report current breastfeeding is 95% in the first month of life. However, breastfeeding shows a marked decline on a monthly basis to well under 40% by the end of the study period. Similarly, there is an earlier but more precipitous decline in exclusive breastfeeding, although there are some women who do breastfeed exclusively up to and beyond the third month of life, but not, in this sample, beyond six months.

Children in Bogota were classified, by what they were fed in the 24 hours prior to the time of the interview, into one of seven possible feeding patterns constructed from combinations of breastmilk, breastmilk substitutes (cow's milk or infant formulas) and food supplements. This classification is depicted in Table 3-2.

Of the children less than one month of age, 46.1% are exclusively breastfed. This declines precipitously as food

supplements and breastmilk substitutes are added to the diet. Thus, by the second and third months of life only 10% and 1.6%, respectively, of the infants are exclusively breastfed (Table 3-2). Even in the first month of life, more than half of the children who were being breastfed received some supplementary nourishment. Feeding solely with foods or breastmilk substitutes, however, was uncommon at any age. Even in the first month of life, when almost 80% of the infants received only milk in the diet, only 4% of infants were fed on nonhuman milk exclusively. Thus, we can conclude that an important infant feeding habit of Bogota mothers is a low incidence of EXCLUSIVE breastmilk beyond the end of the first month of life, and reliance on supplementary foods and milk substitutes.

By three months of age, diets based on milk alone become rare, and, except for a handful of breastfed babies, are nonexistent by the end of the fourth month of life. Figure 3-3 corroborates this conclusion. This figure presents a different perspective on the feeding patterns of the infants in the sample. It shows the percentage of children in different age groups who consume different types of milk and foods. The data reveal that very few children receive breastmilk substitutes as the only source of milk during the first two months of life. Since almost 90 percent are receiving breastmilk, it appears that mothers either breastfeed or give a mix of breastmilk and milk substitutes. By three months of age, however, nonhuman milk as the only source of milk becomes more common (about one third of the sample), and from four months of age onwards, the single most common feeding pattern is food plus nonhuman milk.

Figure 3-3 clearly demonstrates that the predominant infant feeding pattern from four months of life is one which includes a combination of breastmilk, breastmilk substitutes and other foods. This substantiates data presented in Table 3-2, where it is apparent that nearly 100% of the cohort at four months of life was receiving food supplementation in combination with some form of milk. Again, Table 3-2 emphasizes that the period commencing at the end of the third month of life represents a crucial change in feeding pattern. Non-human milk and food as a typical choice becomes significant and steadily continues to increase in importance with the age of child. Conversely, mixed regimes which include breastmilk decrease from that period onwards.

In Bogota, then, introduction of foods is early and widespread, regardless of whether breastmilk or milk substitutes are the source of milk in the diet. To reiterate, for mothers of children four months and over, two feeding choices appear to exist: the most common is breastmilk substitute and food and the other is breastmilk with both milk substitutes and foods.
A combination of breastmilk and other foods appears to be the most common "traditional" diet among Colombian mothers, according

to ethnographic interviews of a group of grandmothers living in various sectors.

Foods play a crucial social and medicinal role in addition to their nutrient value in Colombian culture. Indeed, both health and illness are constructed and experienced in Colombia through a system which relies on hot-cold distinctions for behavioral and therapeutic prescriptions. Breastfeeding behavior, and infant care habits are embedded in this specific cultural context, which must be described in order to understand how Bogota mothers respond to these fundamental human experiences. The following sections will consider this cultural environment within a more precise analysis of both the details of breastfeeding practices and of supplementation.

Table 3-1 Initiation of Breastfeeding By Sex

Ever Breast-fed	Male		Female		Total	
	(N)	%	(N)	%	(N)	%
Yes	337	97.4	347	96.1	684	96.7
No	9	2.6	14	3.9	23	3.3
Total	346	100.0	361	100.0	707	100.0

Table 3-2 Feeding Pattern by Age of Child

Feeding Pattern	Age of Child (by Month)																	
	0		1		2		3		[illegible]		5		6-8		9-11		Total for all ages	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Breast-milk Only	(35)	46.1	(9)	13.6	(7)	10.3	(1)	1.6	(2)	3.8	(3)	5.3	(1)	1.7	(0)	0	(58)	8.4
Breastmilk & Nonhuman Milks	(22)	28.9	(12)	18.2	(11)	16.2	(3)	4.9	(0)	0.0	(0)	0.0	(0)	0	(0)	0	(48)	7.0
Nonhuman Milk Only	(3)	3.9	(4)	6.1	(3)	4.4	(1)	1.6	(0)	0.0	(0)	0.0	(0)	0	(0)	0	(11)	1.6
Breastmilk, Nonhuman milk, & Other Foods	(5)	6.6	(22)	33.3	(25)	36.8	(25)	41.0	(18)	34.0	(18)	31.6	(56)	36.9	(32)	20.5	(201)	29.3
Breastmilk and Other Nonmilk Foods	(10)	13.2	(9)	13.6	(15)	22.1	(10)	16.4	(10)	18.9	(8)	14.0	(18)	12.1	(11)	7.1	(91)	1[illegible].2
Nonmilk Foods Only	(0)	0.0	(0)	0.0	(0)	0.0	(2)	3.3	(1)	1.9	(1)	1.8	(2)	4.4	(2)	3.0	(8)	1.2
Nonhuman Milk and Nonmilk foods	(1)	1.3	(10)	15.2	(7)	10.3	(19)	31.1	(22)	41.5	(27)	47.4	(72)	45.5	(111)	71.2	(270)	39.39.3

Figure 3-1

Percentage of Children Initiating Breastfeeding

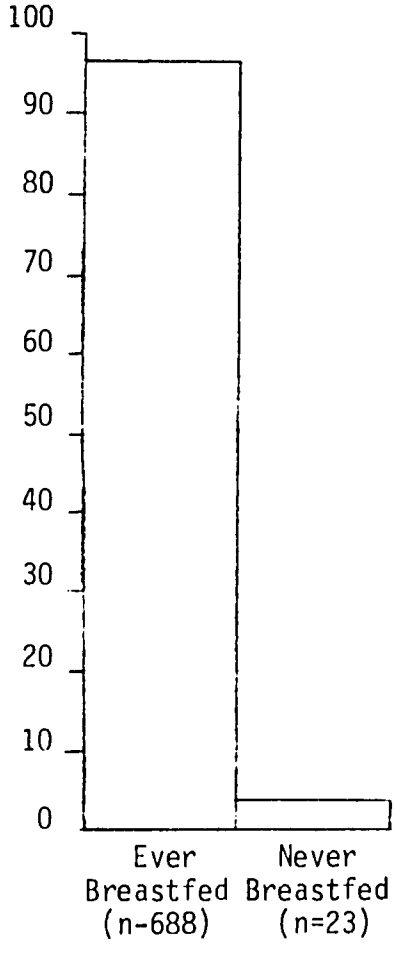


Figure 3-2
Breastfeeding Patterns

Never breastfed (n = 23, 3%)

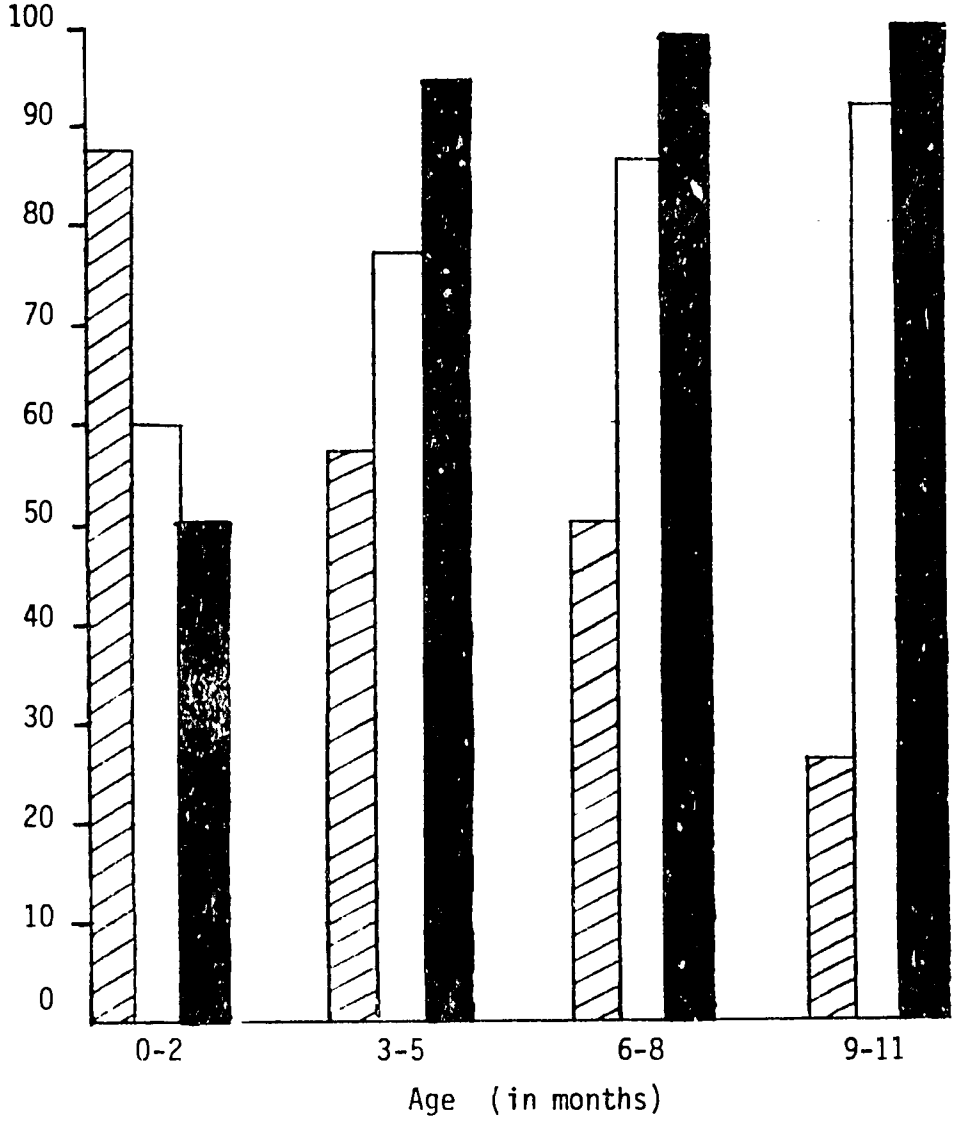
Ever breastfed (n = 273, 62%)

Currently breastfeeding (n = [illegible] 58%)

Exclusively breastfeeding (n = 58, 8.4%)

Figure 3-3

Percentage of Children Consuming Different Milk and Foods by Age of Child



Key:

Any breastmilk

Any breastmilk substitute

Any other food

Chapter IV INFANT FEEDING PRACTICES: DETAILS OF BREASTFEEDING

Patterns of Breastfeeding

Although breastfeeding initiation is high in Bogota, by the third month, supplementation with both non-human milk and foods is well established. Exclusive breastfeeding all but disappears after the second month of life. In the previous section, Figure 3-2 showed the proportion of exclusively breastfed children among the total sample. In contrast, Figure 4-1 presents the proportion of exclusively breastfed children among those currently being breastfed. This figure shows that true exclusive breastfeeding, with no breastmilk substitutes or other foods, is important (at 50%) during the first month of life only. In the second month, it precipitously declines to about 17%, with another dramatic fall to 3% by the third month. Among children 3-6 months of age exclusive breastfeeding never rises above 10%, with no children exclusively breastfeeding thereafter.

Figure 4-2 is a lifetable that demonstrates the proportion of a group of children who initiate breastfeeding at birth who continue to breastfeed at monthly intervals. Among children who begin to breastfeed at birth, 90% are still breastfeeding after one month, and approximately 65% at four months of life. In comparison, Figure 4-3 is a somewhat different view of breastfeeding duration. It shows the percentages of the entire sample that have breastfed for certain durations. The two figures depict a similar pattern, namely that while initiation of breastfeeding is at 97%, the proportion that continues to breastfeed for long durations is considerably lower. For example, approximately 75% of the children aged 3 months or older have breastfed for at least 3 months, but only 56% of those older than 6 months were breastfed for at least 6 months.

There is an obvious desire on the part of many Bogota women to continue to breastfeed their young infants to some extent, however. A survey question asking, "what is the best food for a child the same age as yours," elicited 'breastmilk' as a response in 81% of the women with children between 0-2 months of age, 46% of those with children aged 3-5 months, and 32% of those with 6-8 month old children (Table 4-1). The public health problem in Bogota is not one of initiation of breastfeeding, then, but of continuation and of early supplementation. Although it appears that breastfeeding duration is long for some children, the duration data must be considered in conjunction with the question of exclusive versus supplemented breastfeeding. Since most children receive supplementation of foods and non-human milks very early, supplementation may be providing a major source of infant nutrition after the second month of life. In order to

evaluate duration of breastfeeding from the point of view of early nutrition, the frequency of breastfeeding also must be considered.

The number of breastfeedings in a 24 hour period may give an indication of the portion of nutrients being supplied by breastmilk. Table 4-2 shows the mean and standard deviation of daily breastfeeding frequencies for different age groups of breastfed children. The most obvious finding is that frequency declines from a high of 8.0 feedings per day at birth to 6.9 and 4.0 feedings per day at 1 and 11 months respectively. This pattern is entirely consistent with the practice of exclusive breastfeeding in the first month of life and a rapid change in feeding patterns thereafter when other milks and foods are supplemented.

Figure 4-4 depicts daily frequency of breastfeeding by age of child. As can be seen, the percentage of infants who are not currently breastfed increases in the older age categories. The distribution of breastfeeding frequency also changes over time. As the infants approach one year of age, breastfeeding frequency tends to decline. After eight months of age no mothers report feeding more than 9 times per day and very few are nursing more than three times a day. As early as the end of the third month, less than half of women are breastfeeding more than 3 times a day. This may have implications both for infant nutrition and maternal fertility. Even among women who continue to breastfeed, breastmilk appears to constitute a less important part of the diet among infants over three months of age, as evidenced by the declining frequency of episodes per day.

Figure 4-5 shows the frequency of daily breastfeeding episodes among women who breastfeed their children exclusively. It is apparent that the overwhelming majority of women who breastfeed exclusively have a daily frequency of breastfeedings greater than five. The distribution of frequency of nursing over time appears to be more related to the introduction of supplements since, among those who breastfeed exclusively, the number of episodes per day does not seem to drop so precipitously with age.

Figure 4-6 presents daily frequency of breastfeeding among women who report the use of supplementary foods, and it shows a very different pattern. Even in the earliest months of life, almost 40% of infants are breastfed fewer than six times per day. By 9-11 months, more than 50% supplemented breastfed children are nursed less than four times per day. This appears to support the conclusion that, in Bogota, reduction in the daily frequency of breastfeeding over time are due to changes in feeding patterns and not simply to the age of the child.

Tables 4-3 and 4-4 indicate that more than three-quarters of the women breastfeed on demand and that about two-thirds of them use both breasts at each feeding, a few women report using only one breast and some alternate left and right from feeding to feeding. Table 4-5 presents data on nighttime breastfeeding by age of child, indicating that almost all breastfed children of all ages are nursed during the night. The similarity in distribution by age of child is unexpected, since one might assume, given western models of infant feeding, that night feeding would decrease or even cease once bottles and foods were added and as the child grew older. It is possible that some women interpreted "night feeding" to mean before bedtime, rather than at various hours throughout the night. On the other hand, there is a "reverse rhythm" pattern in some societies where the most frequent breastfeeding takes place at night, especially when mothers are out of the house during the day. Night feeding is closely related to sleeping arrangements of the mother and child as well.

Feeding Patterns and Postpartum Amenorrhea

Duration and intensity of lactation are associated with duration of postpartum amenorrhea and, hence, natural infertility. Our data permit some evaluation of the effect of lactation on post-partum amenorrhea with respect to (1) frequency of breastfeeding and (2) supplemented versus exclusive breastfeeding practices. The following analysis is based on 662 cases with valid data on breastfeeding practices and length of amenorrhea.

Forty-one cases were excluded in this analysis of amenorrhea because of a reported length of breastfeeding greater than the current age of the child. Eight more cases were excluded because the reported length of amenorrhea was greater than the current age of the child.

The estimated median length of breastfeeding is 7.86 months, while the estimated median length of amenorrhea is 3.80 months. Among those women who have weaned their children (currently not breastfeeding, and with known length of breastfeeding), there is a positive relationship between the known length of breastfeeding and median length of amenorrhea:

Known length of breastfeeding	Median length of Amenorrhea	
0 < Length < 3	2.52	(n=144)
4 < Length < 7	3.50	(n=37)
8 < Length < 12	6.00	(n=4)

The mean frequency of breastfeeding among currently breastfeeding women for each postpartum month (age of child) was presented in Table 4-2. There is a pattern of decreasing mean frequency of breastfeeding as the child grows older. In order to assess the effect of frequency of breastfeeding on amenorrhea status, the proportion amenorrheic between the "high frequency" (greater than six times per day) and the "low frequency" (less than six times per day, currently non-breastfeeding women not included) breastfeeders are compared. The results are presented in Table 4-6. At each postpartum month, the proportion amenorrheic is higher for the "high frequency" breastfeeders.

Presumably, the more the infant's diet is dependent on the mother's breastmilk, the more the suckling stimulus, necessary for the maintenance of amenorrhea, is present. In all postpartum months, the proportion amenorrheic is lowest for those women who have weaned their child (Not breastfed), and the proportion amenorrheic is highest among the exclusive breastfeeders (Breastfed only) (Table 4-7).

The median length of breastfeeding and median length of amenorrhea by age of the mother are presented in Table 4-8. There seem to be no obvious trends in the median lengths of breastfeeding and amenorrhea by age of the mother. It is of interest to note that although the youngest age group (less than 20 years old) has the longest median breastfeeding length (greater than 11 months) this group also has the shortest median length of amenorrhea.

Table 4-9 presents the results of an assessment of median breastfeeding and amenorrhea lengths according to parity. There is, again, no obvious linear trend in the median breastfeeding or amenorrhea lengths with parity of mother. The small number of cases with high parity (parity six or above) makes it difficult to draw any conclusions about high parity women.

In summary, high frequency, exclusive breastfeeding in this sample produced longer durations of amenorrhea and, presumably, acted as a natural contraceptive for the mothers.

Breastfeeding Practices in the Puerpurium

Although cross-sectional data indicate that almost 9 out of 10 women initiated breastfeeding with the use of colostrum (Table 4-10), ethnographic case studies suggest that the greatest incidence of initiation occurred on the third day. Cinnamon and or sugar water are mentioned as a traditional prelacteal feeds among women of Sector I...

"...the mothers and some grandmothers are used to giving sugar and cinnamon water to the babies during the first days of life while the mother's milk comes in."

In another instance,

"...after this child was born, the mother and grandmother fed her for a day and a half with sugar and cinnamon water. Later she was breastfed for two days but the milk stopped coming out, then they tried cows milk...half milk and half cinnamon water."

Ninety percent of the children in the sample were born in hospitals. All of the women in the in-depth case study in Sector II gave birth to their children in a hospital, and all of them indicated that their infants were given either Dextrose or S26, Nan or other formula milks immediately after birth. The use of prelacteal feeds as a replacement for colostrum and its possible effect on initiation of breastfeeding is cause for concern. What is even more significant is the use of milk in the hospital and its relationship to reasons why some children were never breastfed. Some of the mothers who reported "never having any milk" as the reason for not initiating breastfeeding may have been influenced by the premature use of bottled formulas. This and other health services related questions will be examined in following pages where the characteristics of women who never breastfed or who suffered from an insufficient milk supply are described.

Differential Feeding of Boy and Girl Infants

A close examination of the cross-sectional data suggests that there may be a differential response to boy and girl infants, in terms of preferred infant feeding patterns and mothers' responses to breastfeeding difficulties. The data are by no means conclusive, but are presented because of their possible implications for child health and welfare.

Although there are no differences between boys and girls in terms of initiation of breastfeeding or current breastfeeding, differences do appear in feeding patterns in the first and second months of life. Boys and girls begin life exclusively breastfeeding at about the same rate (43% for boys and 49% of girls). Both sexes are unlikely to be fed bottle milk alone in the first month of life (2.9% for boys and 4.9% for girls). By one month of age, however, 21% of the boys are still exclusively breastfed as compared with only 6% of the girls. Accordingly, girls are more likely to be receiving a bottle supplement to breastfeeding at that age (see Table 4-11). In fact, although boys are more likely to be exclusively breastfed at one month, they are also more likely to be totally weaned. This may be a reflection of the fact that, in the first month of life, boys are more likely to have been introduced to the bottle than girls (57% vs 39%). Later on, girls are also introduced to bottle feeding, but breastfeeding appears to be maintained. One of the most striking gender differences in Table 4-11, in fact, is the apparent predominance of two sources of milk for girls vs only one (either breast of bottle) for boys.

Again, food supplementation shows a markedly different pattern among girls and boys. In the first month boys and girls are fairly equally likely to be given food, but by the second month of life, 18% more girl infants are receiving foods than boys. Supplementation with foods appears to be a traditional pattern and will be discussed in the following pages. If sexual preferences are reflected in nutrient distribution, then, it may be that girls are being fed the traditional supplementation of food. Bottle milks, which may be thought to be nutritionally superior, may be used for supplementation of boy infants. Life table analysis of sex and breastfeeding duration (derived from separate data) demonstrates a general pattern where at two months of age girls are breastfed at slightly higher percentages than boys. This pattern continues to seven months and then appears to reverse itself.

Some of the maternal behavior may be explained as simply the addition of supplements in order to curtail breastfeeding. On the other hand, something more subtle may be revealed in the differences in sources of milk and food. In a society with a cultural preference for male survival, it may be that some

mothers very early attempt to add extra nourishment for boys and introduce bottles quickly. For others, exclusive breastfeeding of boys may reflect a pattern of solicitous care and reluctance to leave boy infants with others. Early weaning of boys may be also a result of breastfeeding difficulties caused by slightly earlier initiation of mixed feeding or a reflection of a more immediate response to perceived difficulties encountered in breastfeeding boy rather than girl infants.

We attempted to explore these possibilities in a very limited way by examining working patterns of mothers, stated reasons for weaning, stated reasons why mothers believed their breastmilk to be insufficient, comparing all answers by the sex of the child. Tables 4-12 through 4-18 present some of this data.

There appeared to be little difference in current work status for mothers of girls vs boys (51% and 49% respectively), and no substantiation that mothers with girls returned to work earlier than those with boy infants (Table 4-12). On the contrary, at 2 months of age many more mothers of boys are working than mothers of girls. In comparison, however, 31% of mothers who claimed they weaned their infants because they returned to work had boy babies, and 69% of these mothers had girl babies (Table 4-13). The assertion that the cause of weaning was the baby refusing the breast shows the second gender related difference: two-thirds of the babies weaned for this reason were girls and one-third were boys. Children weaned because of "insufficient milk", were approximately equally boys and girls, but the reason a mother thought she had insufficient milk differed by sex of the child. The most striking difference is that mothers who were concerned about their milk supply because the "child cried" were more likely to be mothers of boys (57%) (Table 4-14).

Breastfeeding Problems and Reasons for Weaning

Some of these gender issues may affect the interpretation of difficulties in breastfeeding experienced by the cohort mothers and may determine whether or not these problems are resolved by cessation of breastfeeding. The mothers were not asked specifically what, if any, problems they experienced during breastfeeding, however, as Table 4-13 shows, 58% of women stopped breastfeeding their infants because of "insufficient milk." The mother's health (8%) and the child refusing the breast(7%) are the other most frequently given reasons. Mother's health refers to problems of breast morbidity, i.e., sore, inflamed, cracked nipples, obstructed flow, etc. as well as systemic illness.

When mothers were queried how they realized they had a problem with insufficient milk (Table 4-14), 53% said that their milk never came in; 28% stated their child's crying indicated insufficient milk; another 11% reported the child did not suckle; and 9% indicated malnutrition on the part of the mother. There appear to be some sex differences in reasons for suspecting insufficient milk and in weaning the child. As Table 4-14 shows, 54% of those whose "milk never came in" had girl infants, however, for all other reasons (i.e., child didn't suckle, child cried, and malnutrition of mother) there are between 8 and 14% more male children than females. There appears to be a real discrepancy in the response a mother has to child's crying or fussiness according to sex. Fifteen percent more mothers with sons believe this behavior is an indication of "insufficient breastmilk" than do women with daughters (see again Table 4-14). This may suggest a cultural as well as an individual response to a child's well being. Desire for the survival of males may exert social pressure upon a mother (by husbands, relatives and peers) if boy infants appear to be unsatisfied or not flourishing on mothers milk alone. This is a complicated issue for small families in a society with high infant mortality. Most of these mothers have three or less children; the infant mortality rate in Bogota is 66 per 1,000 live births.

Women were also asked why their milk dried up. Table 4-15 presents these results: sun and heat were the explanations for 16%, contraceptive use for another 18%, malnutrition 20%, and "by nature" 17%. Much higher percentages of women had boy infants if they indicated that contraceptive use (67% boys vs 34% girls), and sun and heat (56 and 44%) were the causes of "milk drying off." Interestingly (Table 4-16), contraceptive users in general, and oral contraceptive users in particular were <u>not</u> more likely to have sons than daughters. These statistics lead to the speculation that mothers had greater anxiety over boy babies' nourishment and may have been quicker to respond to them by offering bottle formulas and curtailing breastfeeding than they would for their infant daughters.

The mothers were not asked what course of action they took in response to the problem of insufficient milk, "or the milk drying off." They were, however, in a different context, asked what a woman can do in order to produce more breastmilk (Table 4-17). Fifty-three percent of them indicated that they should drink more liquids, (including soup); 16% suggested eating more, and 27% said they would eat brown sugar water alone or with other liquids, herbs or foods. Only 4% suggested breastfeeding more often. When we examined the ways in which women increased milk production in relation to reasons for their milk drying off, there was little correlation between specific cause and response. For example, oddly, only 13 out of the 80 women whose milk had dried off from sun or heat suggested drinking more liquids.

Hot/Cold Theories, The Cultural Context and Insufficient Milk

Ethnographic data indicate that the hot and cold (humoral) theory of disease is widespread among the Bogota cohort. The experience of illness and health is reflected through this universal theory. In turn, the evaluation of illness and the selection of treatments is based upon it.[1] In general, the theory rests on the assumption that a healthy body is somewhat "wet" and "warm" and that disease is a deviation from this state. Some diseases are perceived as a deflection from health towards "cold" conditions and others towards "hot" ones. These conditions may be produced by a change in body temperature, by eating too much food, or by particular substances, which are also classified as "hot" and "cold." Usually, therapies consist of treating "cold" classified states with "hot" foods and medications and "hot" states with "cool" substances. Certain substances should be avoided if one is in a parallel physical state.

Although it may seem from the terminology of hot and cold therapeutics that the theory is based on temperature, the thermal state is not really relevant. Foods, for example, are ingested to produce "cold" or "hot" conditions of the digestive tract depending upon their classification in the "hot" and "cold" system and not on their temperature when eaten. Temperature does play a role in the system with regard to ideas about etiology of certain diseases.

From the ethnographic data, it appears that lactating mothers may be considered to be in a vulnerable state, which is potentially dangerous to both mother and child. This belief may cause a woman to stop breastfeeding when an illness or some other factor "thins" her milk. Many women believe that worry, anxiety, tiredness, and fright all can affect consistency and quantity of breastmilk which, in turn, can produce diarrhea in babies and can only be avoided by cessation of breastfeeding. As Table 4-15 showed, 16% attribute the "drying off" of their milk to changes in temperature. Exposure to cold, as when doing laundry, is said to affect breastfeeding, as does kitchen heat:

> "...One was always very busy around the house and all that heat around used to dry up my milk..."

Moreover, if a mother catches cold, she may stop breastfeeding because it makes the child "feel uncomfortable and cry during the night." As the ethnographer reported,

---

[1]This description is taken from that provided by A. Harwood in "The Hot and Cold Theory of Disease," Journal of American Medical Association, Vol 216,7 pp 153-58 1971.

"...During the last visit the case study mother showed her determination to suspend breastfeeding the child completely. The preceding Sunday she had gotten wet from the rain and as a result caught cold; the child got diarrhea..."

This belief is reinforced by medical personnel who encourage women to cease breastfeeding when ill.

In some cultures there is a procedure to neutralize the unwanted effects of "hot" foods or medicaments by eating a "cool" classified substance simultaneously with a "hot" one. In fact, there are specific antidotes, or ways to avoid insufficient milk, for women in the Philippines who hold similar humoral beliefs.[2] Among Pilipino women who are exposed to cold foods or water or, conversely, have been out in the sun too long or near fire, a similar act performed on the infant can prevent drying of the milk, which might otherwise be caused by the offending hot or cold condition in the mother. Thus, if a Pilipino woman becomes wet, takes a shower or washes clothes, she must give her child a similar bath. If she cannot do this, then she must drink a hot liquid before nursing in order to mitigate the problem caused by exposure to water. Again, to ward off the consequences that exposure to heat or sun might produce, a mother can squeeze breastmilk onto the infant's fontanelle or can perform any number of other rites to produce the needed balance. Examination of the ethnographic data does not reveal any such immediate antidote in Bogota. On the other hand, the ethnography is replete with descriptions from mothers and grandmothers regarding activities and foods associated with childbearing women and neonates. For example, women suggested bathing and/or massaging infants with a variety of ingredients and liquid nutrients as a way of assuring good health. A bath in milk or milk with brandy every three days was suggested by one respondent. Other low income women bathe their children with boiled water while some add alcohol, mint, fennel, vegetable water, sheep milk, breastmilk, curd, and egg. The reasons for using these and other ingredients in baths and massages are, among others, to assure a good night's rest, to avoid colds, to penetrate the pores, to help walk well, to avoid rickets, and to give the child "good color".

Among these Bogota mothers, it is thought that one way to prevent decreased milk supply may be adherence to pre and post-natal diets and, especially, to the 40 day postpartum rest period. Many women were aware of traditional diet prescriptions and believed in their importance but few appeared able to adhere to the specifications. Grandmothers also were able to describe

---

[2] E. Fernandez and G. Guthrie: "Belief systems and breastfeeding among Filipino urban poor," Social Science Medicine, Vol.19, 9 pp. 991-996 1984.

what should and should not be done after the birth of a child. The following examples underscore the importance of diet and postpartum rest as well as other rituals and health care procedures for the mother.

One of the women, in spite of not having kept to the postpartum diet, said:

> "...the lady who took care of me in the Restrepo neighborhood gave me soup and beef broth during the early days; but then on the fourth day I just had to get up and go to work..."

In some cases, the grandparents insisted that the mother take certain care:

> "...I was advised by my parents not to eat pork, avocado, fat, or fizzy drinks, and not to watch TV because I'd get a headache... I did all this when I had my previous child, but not with this one and not anymore..."

Another mother, also living with her parents, said:

> "...Keeping the diet is necessary; one cannot exceed oneself. One should not get wet or sunburned, and heavy chores must be avoided... If one is not careful one can have hemorrhages. I was under intensive care for 40 days and Ana used to come and fix me, rub me with hot herbs such as rue which was good to heal inside... Then she'd bandage me..."

Older women described post-natal care, which they believe to have been better in the past than it is now:

> "...When one was pregnant one still had to work. No special care was taken, although chicken or lamb broth and eggs were always there, of course... How much does a chicken cost nowadays? I used to keep a special diet for 10 days and would wrap myself well to get up in the morning; then I wouldn't eat any "irritating" thing such as pork, creole potato, cabbage, pepper, or any stuff like that... One wasn't supposed to get up either..."

> "...Those 40 days were days of not going to wash in the river or getting exposed to the sun... My husband wouldn't leave until I had taken my breakfast, and I only did light housework at that time... There were no mills or grinders then, but mortar and stone only; so one started with the mortar little by little... Sweep-

ing the floor wasn't good, for it was said to cause the uterus to "fall down." No one feels sorry for those poor women who go right back to ironing and everything upon leaving the hospital. What a grief!..."

"...One used to eat one or two chickens... Now they go to the clinic to give birth and three days later they're already doing all sort of housework, and that's why they are so unhealthy... I used to take very good care of my health..."

One of the mothers told us that she had never taken special care of her diet. On the day following birth, if the hospital was near home, she walked home and returned to her normal life, without eating special foods. When she did not take proper care of herself, she came down with recaida: fever, chills, and no "energy to work." It is important to keep the diet to avoid any relapse.

Diets should be followed with a great deal of care because recaida is dangerous:

"...My mother always took care of my diet. On the fourth day after the baby's birth she bathed me with water of altamisa (atibrosia artemisaecolia) and albahaca (ocicum basilicum) to prevent against colds and recaida. Recaida in the diet comes with chills, fever, and depression in general. If the baby is being breastfed it is better to suspend breastfeeding so that the illness does not pass on to the child..."

Since most poor women in our ethnographic sample could not adhere to recommended postnatal behaviors, it is not surprising that many report "insufficient milk" and other difficulties in breastfeeding. "Insufficient milk appears to be a culturally defined syndrome where the quality and quantity of a woman's breast-milk is affected by her physical condition. It does appear that poor women in our sample live and work under difficult economic and social conditions in Bogota as compared with their lives in the districts from which they migrated. These women are unable to avoid work or strenuous exertion after delivery and cannot follow postpartum diets, ritual massage and so on. The effects are felt to be manifested in the composition and volume of the milk. If childbirth places a woman in a vulnerable state, then the failure to take proper care of herself afterwards could reasonably result in illness and difficulties in breastfeeding. The inability to eat well (quality, quantity and types of prescribed foods for themselves and their children) is a serious source of anxiety to these women whose resources cannot assure a ready supply of all types of food.

In summary, insufficient milk and many breastfeeding difficulties experienced by new mothers (which can lead to the very early introduction of bottle milks) may be a manifestation of a deteriorating position and condition of women in Bogota. The sample women may be experiencing an assault on their status and position as women and mothers, along with perceived deterioration in living standards. In this regard, it should be mentioned that there is no discussion of any rituals or celebrations affirming the birth of a child among the sample Bogota families. This is peculiar. Most societies, except those undergoing violent social stress, ceremonially mark life cycle events. Childbirth is often an occasion for celebration. The absence of these data may be an oversight or a theoretical exclusion by the ethnographers, since there is also no mention of religious beliefs and their effect upon attitudes towards motherhood or infant care among this sample of Roman Catholics.

Ignoring the role of religion and ritual which may commend motherhood or the productive role of women can only result in an unsatisfactory programmatic approach to improve mother-infant care and feeding behavior. In order to develop a feasible public health strategy, the central question of how to reaffirm the social value of women's reproductive roles must be considered. This is particularly true with regard to breastfeeding where difficulties may be increased by the attitudes and behavior of the men (including husbands, physicians, and policymakers) who are in a position to influence women's childrearing choices.

Use of Bottles and Weaning

Ethnographic evidence suggests the existance of a self-fulfilling cycle: perception of poor or insufficient milk; the introduction of bottle formula; followed by decreased interest in breastfeeding by the infant and a diminution of mothers' milk, which leads, one way or another, to a prematurely weaned baby. The following illustration from a mother in sector II depicts the cycle:

> "...When I got home from the hospital I stopped with the bottle and started breastfeeding only, because I had too much milk, and it spilled out. Then when I saw that the milk started to decrease and the baby was left hungry, I'd give him the breast first, and then I'd give two ounces from the bottle. When, at the third month, I had no more milk at all, I started bottle feeding only..."

Forty-five percent of the women who used other milk did so because of perceived insufficient breastmilk (Table 4-18), this is overwhelmingly the single most common reason given by these mothers - more than three times as often cited as the next most common reason, maternal employment. In fact, as Table 4-19 shows, 43% of women who did not use supplementary milk declined to do so because they had a sufficient milk supply. Aside from maternal employment (14%), as a reason for use of other milk, 12% of the women thought that giving non-breast milk would "help maternal milk" supply. Clearly, there is inadequate education on the effects of too early introduction of artificial milks to an infants' diet. Women need both information and support in order to respond in a biologically efficacious way to perceived reductions in milk supply.

As Table 4-20 shows, of 245 women who supplemented and responded to the question, "when is supplement milk given?", 71% give bottles of milk to their infants at times other than near breastfeeding. Seven percent feed bottle milk before breastfeeding and 22% immediately thereafter. All three groups are at risk of diminishing breastmilk production.

Bottle feedings immediately before and after breastfeeding can establish a pattern in a child of lessened interest in breastfeeding either because he or she is already satisfied or is habituated to the faster flowing milk anticipated after breastfeeding. Bottles in between breastfeeding decrease the frequency of breast stimulation. This causes decreased milk production. The fact that almost 60% of the women weaned their infants because of insufficient milk and 7% more stated their child refused the breast (Table 4-13) adds credence to this hypothesis.

The concept of "Weaning Interval" was developed to describe the time between the introduction of the first supplement and the cessation of breastfeeding. Table 4-21 presents weaning intervals for children who have been bottlefed. Among those infants who receive a bottle in the first few months of life (0-2), more than 50% were weaned in less than 2 months. Only 8% of weaned children took more than 3 months to wean completely after introduction of milk in bottles.

The ethnographic information leads us to suspect other cultural factors that are intervening to encourage cessation of breastfeeding at first notice of decreased milk supply. The male influence on cessation of breastfeeding appears large and includes husbands, fathers, doctor and pharmacists. It is not unusual for men elsewhere to view breastfeeding as a period of reduced sexual access to women. If this attitude is common in Bogota, then early cessation of breastfeeding would be desirable from the point of view of the husbands. Introducing bottle milk contributes to this end, and the ethnography reports several

husbands who brought formula home for their wives to use. This is not to say that husbands who introduce artificial milk to their children do not have their best health in mind. Since some health professionals and institutions in Bogota recommend the use of bottle formula as superior food, husbands, too, may be influenced by them in this belief.

In the ethnographic data the exertion of male influence over female decisions to discontinue or supplement breastfeeding is found time and again in the context of prenatal and postpartum feeding advice. By way of example,

> "...During the first month I breastfed only, but my milk wasn't good, it was too watery...and a doctor told me to stop breastfeeding. My father said the same thing, and he assured me that it was because I have a very ill temper and this affected the baby, and also because I was very skinny...then one day I took off my blouse, wet with milk and I put it to dry in the sun. That's why my milk dried off..."

This quotation, from a mother living in sector II, illustrates the combined force of advice offered by dominant individuals (the father, the doctor) with the belief in the hot/cold theory of disease and health, where the performance of a "drying" activity effectively "dried up" the woman's milk supply.

Again, we see the influence of a woman's father,

> "...My father was the one who told me not to breastfeed anymore because I was going to get emaciated, and that instead of milk the child was going to suck blood out of me. That is why I stopped breastfeeding."

These women succumbed to the overwhelming negative male sagacity which not incidentally, would undermine self-assurance regarding a woman's ability to breastfeed and nourish her child. These short illustrations demonstrate male influence over infant care and feeding. On a larger level, this issue is a reflection of questions of power over women and women's efforts to control their own social domain. Male penetration into the traditionally female roles and areas of decision making may seriously undermine the ability and will of mothers to breastfeed for longer durations.

Advice and Beliefs: Their Effects on Breastfeeding

Recommendations by health professionals also affect women's infant feeding decisions. Less than one-third of the cohort mothers reported receiving advice on infant feeding either during their pregnancy or after the birth of the index child(Table 4-22). Interestingly, given the above discussion, none of the mothers reported receiving advice or being influenced by male relatives. Table 4-23 indicates that both before and after the birth of their child more than two-thirds of mothers reported receiving advice from health care personnel, making them the primary source of information and recommendations. There is greater reliance on books and magazines before birth than after (6.1% vs. 1.1%).

The content of advice falls into three major categories: 1) breastfeeding; 2) supplementary foods; and 3) general information regarding personal health care or mothers diet (Table 4-24). The suggestion to breastfeed (with or without supplements) was given to 45% of pregnant women. Postnatally, over 60% received such advice. Approximately one-half of the population received recommendations regarding supplementary foods and milks during pregnancy and post-partum. While only 5.4% reported advice on bottle-feeding during pregnancy, 21% received such information after the birth of their child.

Although the cross-sectional data do not support this, the ethnography describes low income women in sector I and sector II relying predominantly on informal health care personnel (i.e., midwives and pharmacists) for postnatal medical attention and advice on infant feeding and child rearing. In comparison, middle and lower middle income women in sector II utilized doctors and hospital personnel for their care. It appears that both pharmacists and doctors often recommend that mothers stop breastfeeding and use bottle formula when they experience "insufficient milk". In comparison, midwives advised mothers to eat well during lactation and take care of themselves to prevent recaida, i.e. fever, chills, tiredness. Herbs and herbal baths were also recommended to prevent this sickness. These are all traditional ways of avoiding lactation failure as well.

There is a widespread belief, reinforced by doctors and pharmacists, that if the mother is ill, she should suspend breastfeeding for fear the illness will be passed on to the baby. More than one mother claimed her physician located the etiology of her infant's diarrhea in her breastfeeding. Inadequate training regarding nutrition, lactation and disease among health professionals is an area of concern in Bogota.

Between 20-30% of the sample received advice at one time or another from female relatives, friends or neighbors (Table 4-23). Many mothers in sectors II and III, according to the ethnography, have little, if any, intergenerational relationships. Sector III mothers are poor, young and of low

parity. The ethnographers attempted to interview some elders in an effort to document generational differences in attitudes and knowledge of breastfeeding and infant care practices. The grandmothers interviewed stated that they breastfed their children for long periods, on the average of 1-2 years and, in some cases, up to four years of age. One woman stated that she breastfed all five of her children until the age of two. Her doctor advised her to stop breastfeeding after two years because "the baby was sucking off my blood." She followed his advice, but when she saw "the milk being wasted she hated that." The implication here is that breastfeeding infants are parasitic, at least from the doctor's point of view.

Beliefs regarding the effect of emotional states and physical activities on breastmilk consistency, quality and quantity were uncovered by the ethnographers. Women believe getting upset, drinking cold liquids, being exposed to extremes of heat or cold, or breast morbidity all affected the breastmilk. One grandmother declared "...a fit of temper, for instance, or any annoyance or sorrow at breastfeeding time is bad, because the child can get it and die..."

The grandmothers had definite ideas about the timing of the introduction of particular foods as supplementation, beginning in the first month of life. It appears from the ethnography that traditionally, grandmothers who used cow's milk to feed their children diluted it with water and used a spoon to offer it to the child. The older women never used bottles and feel that it is an inappropriate way to feed children. They are fully aware of the problems attendant upon "modern feeding practices," including loss of breastmilk supply when supplementing with bottled formula. As one woman stated,

> "...Why does their milk dry off now? Just because they don't breastfeed...they do for a couple of months and then start with the bottle; thus the child doesn't get used to the breast..."

Time and again, women in all sectors indicated that children used to be healthier and better nourished. The grandmothers in sector II associated this with formula feedings...

> "...Of course, everything is so different for children now, as it is for grownups, and that's why everything is so expensive. It is not easy to find natural things now; everything seems to be artificial...that's why I guess children get sick or malnourished now; they give them those "waters" two or three times a day, and that's all...Especially those who work and leave the children with the grandmother or with a neighbor...by the way, what does a neighbor care about someone else's

child? There are many malnourished, very poorly fed children in this neighborhood. It is so depressing..."

Although many of the younger mothers breastfed, they did so in a mixed pattern, using other milk products as well. The weaning strategy of these young mothers is to introduce other milks, something few of the grandmothers did.

The ethnographic data comparing beliefs and practices intergenerationally lead us to suspect that some young women (in sectors II and III), are isolated from older women with traditional expertise. They may be unaware of the traditional nutritional or therapeutic responses to counter problems of breastfeeding. With no alternative, some may resort to bottled milk. A public health or lactation support program would do well to utilize older women, trained in the dual health care systems.

As noted earlier, women in sector I, one of the poorest districts, were acutely aware of the difference in health and nutrition between their children and those living in the towns and countryside from which they migrated. More important, they indicated that their older children had higher birth weights and were better nourished as infants than their newborns. They attributed this to instability of disposable income (the result of periodic unemployment) and the lack of fresh fruits and vegetables for the women to consume to produce richer milk. It is obvious that the overcrowded living situation and substandard quality of life (often no sanitation facilities, no running water, kerosene or hotplates for boiling bottles and water) make it fundamentally difficult for these poor mothers to provide optimal supplementary infant feeding.

Some mothers stated they tried to increase their consumption of vegetable broth and beer during pregnancy and were aware of the necessity to eat well while breastfeeding, often mentioning eggs, strained corn, and meat broths as preferred foods. Concomitantly, they stated their incomes were prohibitively meager for such a diet. The ethnographers mention that those mothers who earn some income spend it on bettering the nutrition of their children, first to the nursing baby and then to the rest. On the other hand, some mothers implied they engaged in differential feeding of children, giving protein foods, when available, to sicklier children, regardless of age. Supplementation of children's diets with various foods, including herb and vegetable water, was more important than use of milk formulas in this sector.

The ethnographers feel that better ways of feeding children are known among sector I mothers, but that difficulties of life make it impossible to follow these regimes. In Bogota, the ideal is that the use of food should be in harmony with the individual life cycle. People indicated that post-partum care, and care of

children in the past were better than now. Many women felt a sharp deterioration in the quality of life in Bogota. Lack of money to buy designated foods during and after pregnancy was commonly cited. Some women stated that malnutrition was the reason for their milk "drying up." Poor women who cannot keep to the hot/cold postpartum diet, rest and activity recommendations and restrictions may feel themselves at risk for illness or at least poor producers of breastmilk, and cease breastfeeding.

If negative events and improper food can permanently affect a mother and child's health, then it is natural for women who experience them to stop breastfeeding. Yet, premature cessation of breastfeeding not only shortens the emotional closeness of mother and infant, it also diminishes a mother's ability to control her child's health and nutrition. If poor women feel they cannot control their own diets, and by extension their breastmilk, they may believe they have some control over bottled formulas. Unfortunately, this control is illusory since the cost of formula may force women to dilute the feeds or increase hours of work, leading to greater separation from their infants. The pleasure of motherhood, and a respected role as childrearer, become all the more remote for women who must leave infants in day care centers or with others where care may not be optimal.

The metaphor of "blood" appears in some of the women's comments on breastfeeding. This metaphor is clearly used in different ways by different categories of people. Some women feel they are being drained or depleted by their breastfeeding infants. In a different example, one woman mentioned that breastfeeding during pregnancy is bad because "the baby's blood converts into milk and the baby loses its blood." There appears to be a close relationship between "blood and breastmilk," both having to do with the essence of life.

It is necessary to understand the Colombian belief system to assess how common beliefs: (1) may interfere with adequate infant care and feeding; (2) may have positive value which could be utilized to encourage women to breastfeed exclusively or for longer durations, and (3) symbolically function for different categories of people. More specific information on the causes of "insufficient milk" as well as data on the dominant metaphors referring to childbirth, childrearing, women roles and values should also be collected, in order to make suggestions that will be culturally meaningful and operable for Colombian women.

In sum, this study has documented what appears to be a process of change wherein women are experiencing an erosion in their productive domain, accompanied by an assault on the social valuation of their worth as women and mothers. Understanding this dynamic can have important practical implications for public health policies. For example, the case studies are replete with women who extol the value of breastfeeding, and the superior

nutritional value of breastmilk is well accepted. Thus, these do not need to be the basis of health campaigns. More important are messages supporting women's positive self-image as nurturers, assuring them of their capability as lactators and the fact that breastfeeding is a woman's right. A well integrated campaign, including culturally respected ways to prevent lactation failure, would allow women to retain control over infant feeding and discourage the introduction of unnecessary formulas.

Characteristics of Women Who Never Initiated Breastfeeding

Since breastfeeding initiation is the norm in Bogota (97% of our sample breastfed the index child), it seemed appropriate to examine the three percent (23) who did not breastfeed their infants to see if underlying factors could be identified to explain their behavior. Such information could be utilized to develop strategies to overcome practical difficulties of breastfeeding for new mothers.

Women were asked to state their reasons for never having breastfed (Table 4-25); of the twenty responses, 11 (55%) "never had any milk." Another fifteen percent indicated their child refused the breast. A final 30% stated they failed to breastfeed because of mothers' (20%) or child's (10%) illness. Sixty-five percent of the never breastfed children were girls and 40% boys, compared with an overall population of 51% girls and 49% boys.

Of the socioeconomic parameters parity, age, education, and number of persons in a household appear to have some effect on breastfeeding initiation (Table 4-26). Mothers of first-born children are slightly more likely never to breastfeed (4.6%) than the total sample (3.2%). Younger women comprised the largest group of women who never breastfed, and of the 18-19 year old group, only 93% initiated breastfeeding. In households of more than eight people, there also appears to be a slightly reduced chance of initiating breastfeeding. Women from these large households may have many more persons with whom to leave a child, and hence begin bottlefeeding. Seven percent of women with 11-12 years of education never breastfed, and nine percent of those with over 13 years of education never breastfed. Finally, 55% percent of never breastfeeding women compared with 35% of the sample population were born in Bogota. Forty-one percent worked compared with 25% of the sample population. This suggests that working may predispose to a decision not to breastfeed.

In terms of hospital experiences, 62% of the <u>never breastfed</u> children were born in a public hospital compared with 48% of the sample. In an effort to determine whether there might be an illness, or complications of pregnancy and delivery, which

interfered with breastfeeding, a number of factors were examined. For example, of the 44 infants placed in incubators after birth, 11% (5) of them were never breastfed; of the 28 neonates who remained in the hospital after their mothers left, 11% also were never breastfed. More specifically, 14% of the premature infants, 25% with respiratory problems and 13% with low birth weights who remained in the hospital were not breastfed. Finally, twenty-one percent of the never breastfed babies had received formula milk in the first day of life, compared with 5.5% of the entire population. It may be that poor information about milk supply combined with artificial milk used in the first few days of life may have influenced these mothers not to breastfeed.

Clearly, ill babies are at a higher risk than normal births of not being breastfed. The special care and feeding of these babies may make breastfeeding very difficult. It also may indicate a woman's tendency to remain separate from a child who is less healthy and strong in anticipation of early infant loss.

It is nevertheless important for premature and low birth weight infants and those with respiratory illness to be breastfed. They are at greater risk for nutritional deficiencies, infections, and failure to thrive, especially if fed artificially with diluted, contaminated bottlemilk. The ethnography suggests that women dilute "other milks" with a variety of substances, including flours, herbs, and panela, because of a belief that milk is too "heavy" for young infants. Over-diluted feedings for a child who is not receiving any breastmilk increases the risk of malnutrition. This cultural preference for dilution of bottle milks should mandate that hospitals encourage mothers of ill babies to express their milk, if breastfeeding is impossible in the first few days. In addition, some sort of visiting nurse or health professional should encourage women when their babies are released to stimulate lactation and breastfeed, regardless of the child's food source when hospitalized. Poor young women are at greatest risk for premature and low birth weight infants and have the greatest likelihood of diluting their babies' milk. They, too, must be targeted by any public health campaign directed to the goal of breastfeeding.

Table 4-1 "What is the best food for a child the same age as your child?"

Age	(N)	Breastmilk	
0-2 Months	(218)	(177)	81.2
3-5 Months	(178)	(82)	46.1
6-8 Months	(152)	(49)	32.2
8+	(163)	(30)	18.4
Total	711	(338)	48%

Table 4-2 Mean Frequency of Breastfeeding By Age of Child (Breastfeeding Children)

Months	Mean Frequency	SD
0	8.0	3.1
1	6.9	3.4
2	6.6	3.1
3	5.4	3.1
4	5.7	3.6
5	5.9	2.9
6	4.9	2.7
7	4.7	2.5
8	5.8	2.5
9	5.4	3.2
10	4.6	2.8
11	4.0	2.8

Mean 6.0

Table 4-3 Breastfeeding Schedule

	N	%
Breastfeeding on demand	318	78.1
Breastfeeding on a schedule	89	21.9
Total	407	100.0%

Table 4-4 Laterality of Breastfeeding

	N	%
Always use both breasts	263	64.6
Only left breast	24	5.9
Only right breast	33	8.1
Alternating	87	21.4
Total	407	100.0%

Table 4-5 Nightfeeding By Age of Child

Age	Yes (N)	%	No (N)	%
0	>0	95.9	3	4.1
1	53	96.4	2	3.6
2	59	96.7	2	3.3
3	3	92.3	3	7.7
4	29	90.6	3	9.4
5	27	90.0	3	10.0
6	32	88.9	4	11.1
7	22	91.7	2	8.3
8	16	100.0	-	-
9	10	100.0	-	-
10	19	95.0	1	5.0
11	10	76.9	3	23.1
Total	383		26	

Table 4-6 Proportion Amenorrheic by Frequency of Breastfeeding

Postpartum Months	Frequency < 6 times		Frequency > 6 times	
	Prop(AM)	(N)	Prop(AM)	(N)
0,1	84.6	26	96.8	94
2,3	54.5	44	73.1	52
4,5	29.0	31	58.6	29
6,7	23.1	39	57.9	19
8,9	0.0	0	14.3	14
10,11,12	9.1	22	28.6	7

Table 4-7 Proportion Amenorrheic by Patterns of Feeding

Feeding Patterns	Months 0,1	2,3	4,5	6,7	8,9	10,11	(N)
Breast-fed only	97.7	100.0	80.5	100.0	-	-	56
Breast-fed + food	88.9	70.8	44.4	41.7	22.2	57.1	88
Breast-fed + milk	91.2	58.3	-	-	-	-	46
Breast-fed + food + milk	95.8	56.0	36.1	32.6	-	-	193
Not breast-fed	63.6	13.3	6.8	4.3	5.4	1.6	248

Table 4-8 Median Length of Breastfeeding and Amenorrhea by the Age of the Mother

Age of Mother	Median Breastfeeding	(N)	Median Amenorrhea	(N)
<20	>11.00	85	2.89	89
20-24	7.44	212	3.29	223
25-29	6.43	146	3.32	156
30-35	7.05	100	3.21	102
35+	>10.00	54	3.80	59

Table 4-9 Median Length of Breastfeeding and Amenorrhea by Parity of Mother

Parity of Mother	Median Breastfeeding	(N)	Median Amenorrhea	(N)
One	7.86	216	2.76	229
Two/Three	7.08	275	3.38	292
Four/five	11.00	78	4.60	80
Six/seven	6.56	15	3.72	15
Eight	3.89	5	6.00	5

Table 4-10 Feeding of Colostrum

Did Child Receive Colostrum?	N	%
Yes	587	89.9
No	66	10.1
Total	653	100.0%

Table 4-11 Aspects of Feeding Patterns By Sex

	0 month		1 month		2 months	
	B	G	B	G	B	G
Pattern						
A. Exclusive BF	43.0	49.0	21.0	6.2	11.4	9.1
Exclusive Bottlefeeding	2.9	4.9	5.9	6.2	5.7	3.0
B. Source of Milk						
Bottle Only	8.6	7.3	38.3	15.6	31.4	9.1
Bottle&Breast	48.6	31.7	29.4	62.5	37.2	57.6
Breast Only	43.	61.2	32.8	21.6	31.4	33.3
C. Any Food	20.0	21.9	64.8	59.6	60.0	78.8

Table 4-12. Maternal Employment by Age of Child by Sex

Age of Child	Mothers Working				Mothers Not Working			
	% Boys yes		% Girls yes		% Boys no		% Girls no	
	n	%	n	%	n	%	n	%
0	1	50.0	1	50.0	34	45.3	41	54.7
1	4	44.4	5	55.6	31	53.4	27	46.6
2	12	70.6	5	29.4	25	44.6	31	55.4
3	7	46.7	8	53.3	20	42.6	27	57.4
4	7	58.3	5	41.7	21	50.0	21	50.0
5	3	23.1	10	76.9	25	55.6	20	44.4
6	11	55.0	9	45.0	22	53.7	19	46.3
7	10	58.8	7	41.2	12	42.9	16	57.1
8	7	50.0	7	50.0	12	38.7	19	61.3
9	5	29.0	15	75.0	17	54.8	14	45.2
10	11	64.7	6	35.3	16	45.7	19	54.3
11	7	38.9	12	62.2	22	61.1	14	38.9
Totals	85 (48.6)		90 (51.4)		257 (49.0)		268 (51.0)	

Table 4-13 Reason Weaned by Sex of Child

	Total		Males		Females	
	n	%	n	%	n	%
Insufficient milk	155	58.1	80	51.6	75	48.4
Work	13	4.9	4	30.8	9	69.2
Child's illness	7	2.6	2	28.6	5	71.4
Baby refuses breast	18	6.7	6	33.3	12	66.7
Age	22	8.2	10	45.5	12	54.5
Mother's illness (inclu.breast morbidity)	21	7.9	12	57.1	9	42.9
Pregnancy	10	3.7	5	50.0	5	50.0
Other	21	7.9	13	61.9	8	38.1
Total	267	(100.0)	132	(49.4)	135	(50.6)

Table 4-14 How Mother Knew Milk Was Insufficient?

	(N)	%	Males		Females	
			n	%	n	%
Milk never came in	80	53.0	37	46.3	43	53.8
Child cried	42	27.8	24	57.1	18	42.9
Child didn't suckle	16	10.6	9	56.2	7	43.7
Mother didn't eat enough	13	8.6	7	53.8	6	46.2
Total	151	100	77		74	

Table 4-15 Reasons Milk Dried Up

	Boys		Girls		Total
	n	%	n	%	n
Mother didn't eat enough	11	55	9	45	20
Contraceptive use	12	67	6	34	18
"By nature"	10	59	7	41	17
Sun and heat	9	56	7	44	16
Insufficient milk	6	50	6	34	18
Child didn't suck	4	67	2	34	6
Anxiety	3	60	2	40	5
Mother used antibiotics	3	75	1	25	4
Work	0	-	2	100	2
Total	58		42		100

Table 4-16 Contraceptive Use by Sex of Child

	Males		Females		Total	
Pill	52	53.6	45	46.4	97	32.2
Injection	9	47.4	10	52.6	19	6.0
IUD	35	42.2	48	57.8	83	28.1
Female Sterilization	17	50.0	17	50.0	34	11.3
Foam/diaphragm withdrawal	16	53.3	15	48.4	31	10.3
Rhythm	7	70.0	3	30.0	10	3.0
Condom	8	53.3	7	46.7	15	5.1
Other	5	41.7	7	58.3	12	4.
Total	149	(50)	152	(50.9)	301	100

Table 4-17 Ways a Woman Can Produce More Breastmilk

	(N)	%
Drink more liquids (including soup)	314	53
Take brown sugar water alone or with other liquids, herbs or foods	156	27
Eat better and more	96	16
Breastfeed more	20	4
Go to a doctor	4	-
Control nerves	1	-
Total	591	100%

Table 4-18 Reason Given for Using Non-breast Milk

	N	%
Breast milk not sufficient	109	44.4
Maternal employment	34	13.8
Helps maternal milk	29	11.8
Medical advice	16	6.5
To accustom the infant	12	4.9
Domestic work	7	2.8
Good for child	6	2.4
Lack of income for giving other food	4	1.6
Other	29	11.8
Total	246	100.0%

Table 4-19 Reason for Not Giving Supplementary Milk

	N	%
Mother's milk is sufficient	64	42.5
Infant unaccustomed to bottle	24	15.9
Infant is small	15	9.9
Lack of money	13	8.6
Child not old enough	10	6.6
Medical advice	7	4.6
Bottle harmful	3	2.0
Custom	3	2.0
Other	12	7.9
Total	151	100.0%

Table 4-20 When is Supplementary Milk Given by Breastfeeding Women?

	N	%
Immediately before breastfeeding	17	6.9
Immediately after breastfeeding	54	22.1
Independently	174	71.0
Total	245*	100.0

*Only includes people answering the question - does not include all women who supplement.

Table 4-21 Weaning Interval By Age at First Bottle

Age at First Bottle	Weaning Interval 0	1	2	3	>4	n
0	19.4	25.4	32.8	13.4	8.9	67
1	20.5	35.8	20.5	10.3	10.3	39
2	59.1	18.2	0.1	29.1	4.5	22
3	35.3	23.5	17.6	17.6	5.9	17
4	40.0	40.0	20.0	00.0	0.0	5
5	00.0	35.0	00.0	50.0	0.0	4
6	37.5	12.5	00.0	37.5	12.5	8
Total	(67)	(39)	(22)		(34)	(162)

Table 4-22 Mothers Receipt of Feeding Advice

	During Pregnancy		Post-Partum	
	(N)	%	(N)	%
Yes	218	31.2	188	26.9
No	480	68.2	510	73.1
Total	698	100%	698	100%

Table 4-23 Source of Advice on Infant Feeding Received During Pregnancy and Postpartum

	During Pregnancy (N)	During Pregnancy %	After Birth (N)	After Birth %
Physician in public health program (S.S. or public health service)	87	40.7	52	27.7
Private physician	27	12.6	32	17.0
ISS physician	-	-	28	14.9
Mother, grandmother, or sister	27	12.6	39	20.7
Nutritionist	8	3.7	-	-
Other health center personnel	15	7.0	11	5.9
Midwife	-	-	4	2.1
Books or magazines	13	6.1	2	1.1
Friends or neighbors	15	7.0	13	6.9
Other	22	10.3	7	3.7
Total	214	100.0%	188	100.0%

Figure 4-24 Content of Advice Received During Pregnancy and Post-partum

	During Pregnancy (N)	%	After Birth (N)	%
Breastfeed	62	30.4	94	51.7
Breastfeed and advice on supplements	29	14.2	16	8.8
Bottle feeding advice	11	5.4	38	20.9
Advice on other supplementary foods	65	31.8	24	13.2
Be careful about diet	15	7.4		
Personal care for mother	10	0	4.9	4
Received instructions on how to prepare food	7	3.0	-	-
Other	5	2.5	3	1.6
Total	204	100.0%	182	100.0%

Table 4-25 Reason for Not Initiating Breastfeeding By Sex of Child

	N	%	Boys		Girls	
			n	%	n	%
Never had any milk	11	55.0	5	45.5	6	54.5
Mother's illness	4	20.0	1	25.0	3	75.0
Child refused breast	3	15.0	1	33.3	2	66.7
Child hospitalized	2	10.0	1	33.3	2	66.7
Total	20	100.0	8	40.0	13	65.0

Table 4-26 Association of Various Variables with Initiation of Breastfeeding

	Ever Breastfed (N)	%	Never Breastfed (N)	%
Birthorder-first child	263	95.4	12	4.6
Income				
Low	131	96.9	4	3.1
Middle	145	96.0	6	4.0
Age of Mother				
18-19	69	93.2	5	6.8
Public Hospital	319	96.1	13	3.9
S.S. Hospital	158	96.9	5	3.1
Bogota-born	236	95.5	11	4.5
Elsewhere	430	97.9	9	2.1
Mother's Education				
11-12 years	87	93.1	6	6.9
13+	41	91.1	4	8.9
Work Now	166	94.9	9	5.1
Room-in				
Same Room	583	97.2	17	2.8
Nursery	88	94.6	5	5.4
Number of Persons in Household				
8-13	119	92.8	9	7.2
Remained in Hospital				
Premature	6	85.7	1	14.3
Respiratory Problems	3	75.0	1	25.0
Low Birth Weight	7	87.5	1	12.5
Total Sample	688	96.8	23	3.2

Figure 4-1

Exclusive and Non-exclusive Breastfeeding by Age of Child

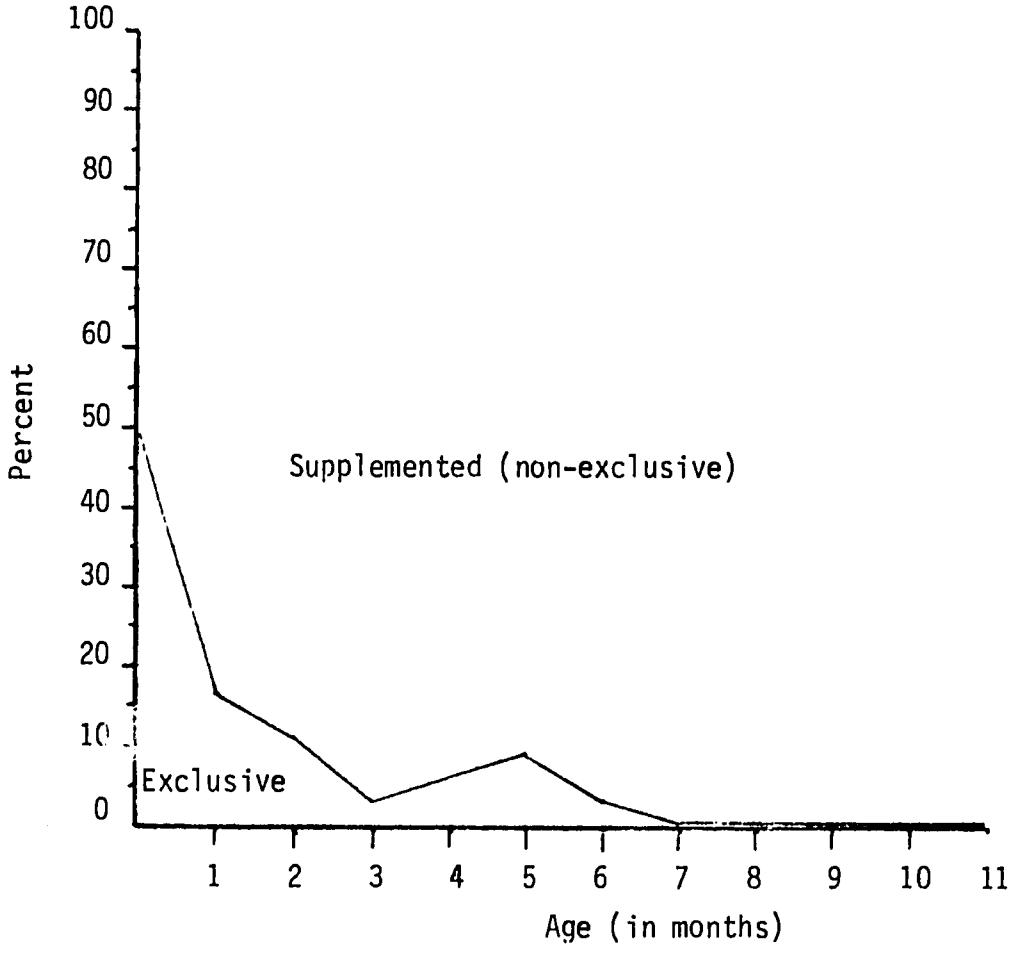


Figure 4-2

Duration of Breastfeeding by Last Breastfeed

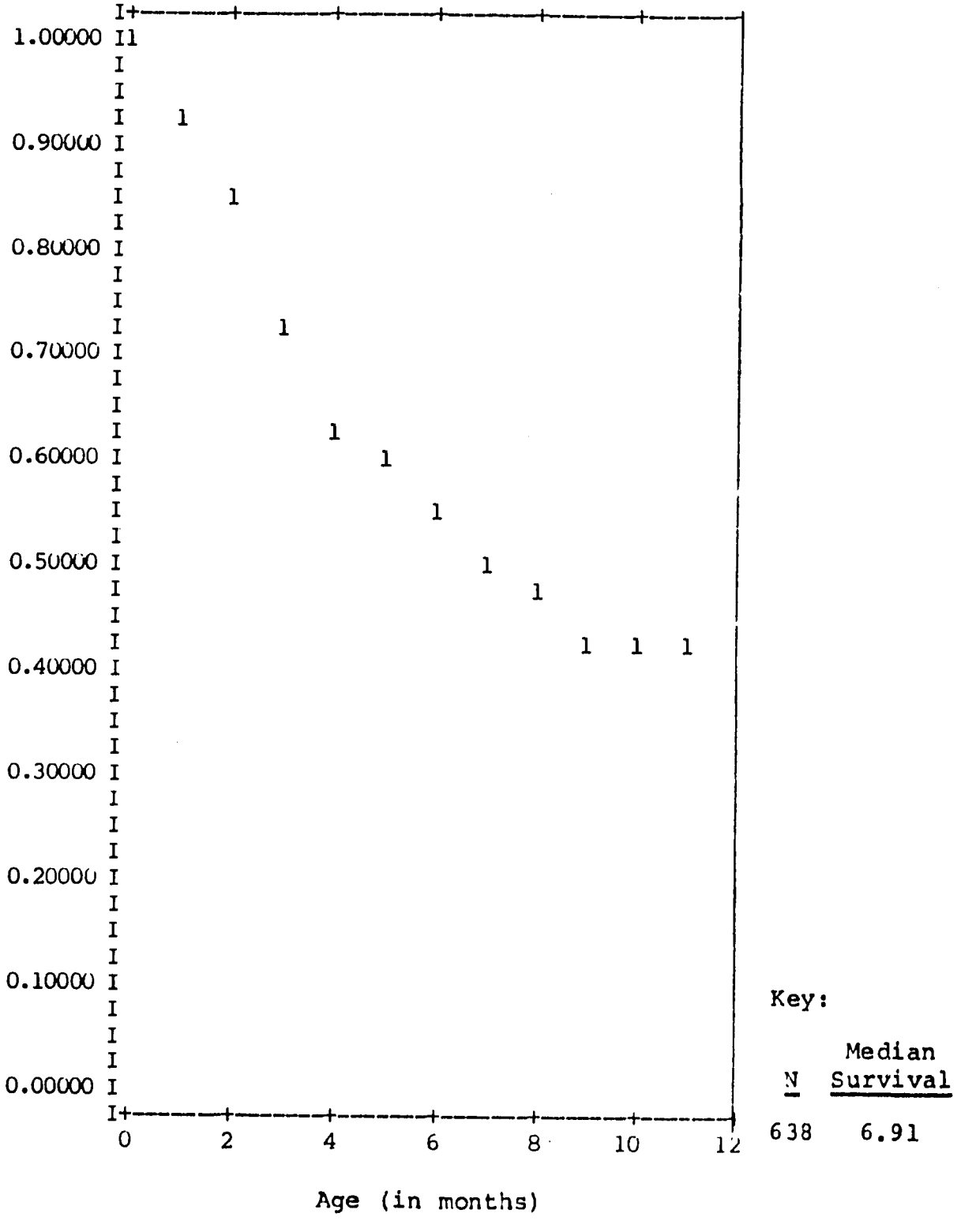
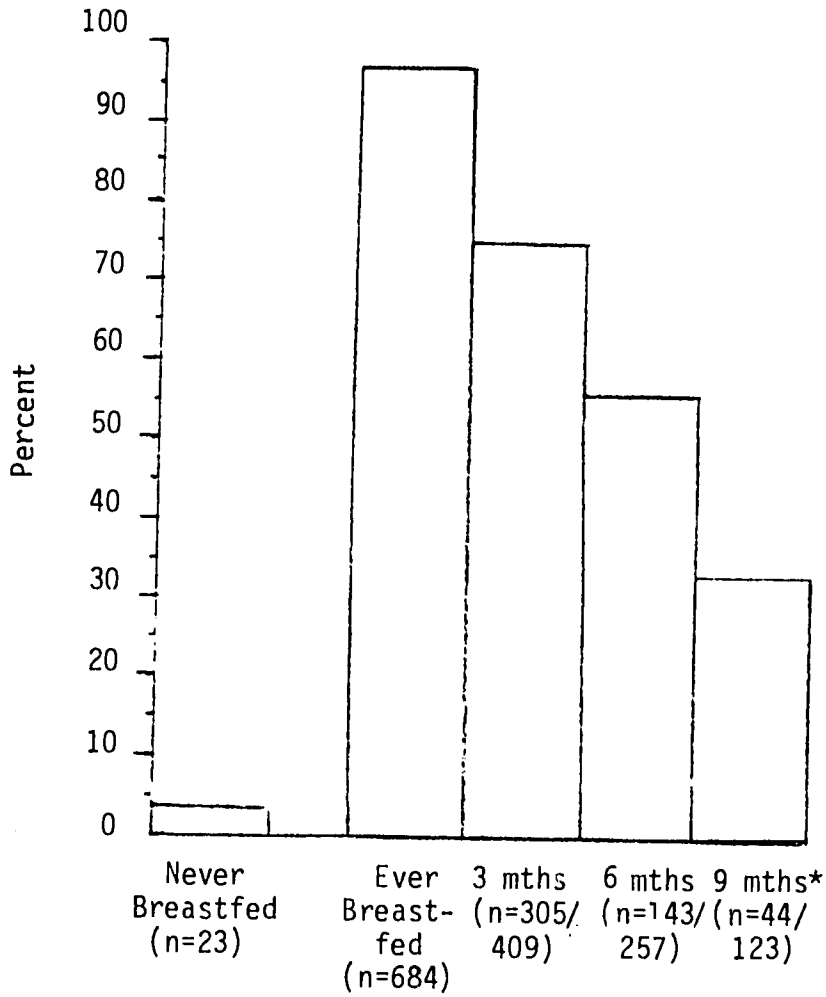


Figure 4-3

Percent of Sample Breastfeeding for Various Durations[1/]



[1/] Based on current and retrospective data

* Variables constructed from data available for date of last breastfeed

Figure 4-4

Number of Daily Breastfeeding Episodes

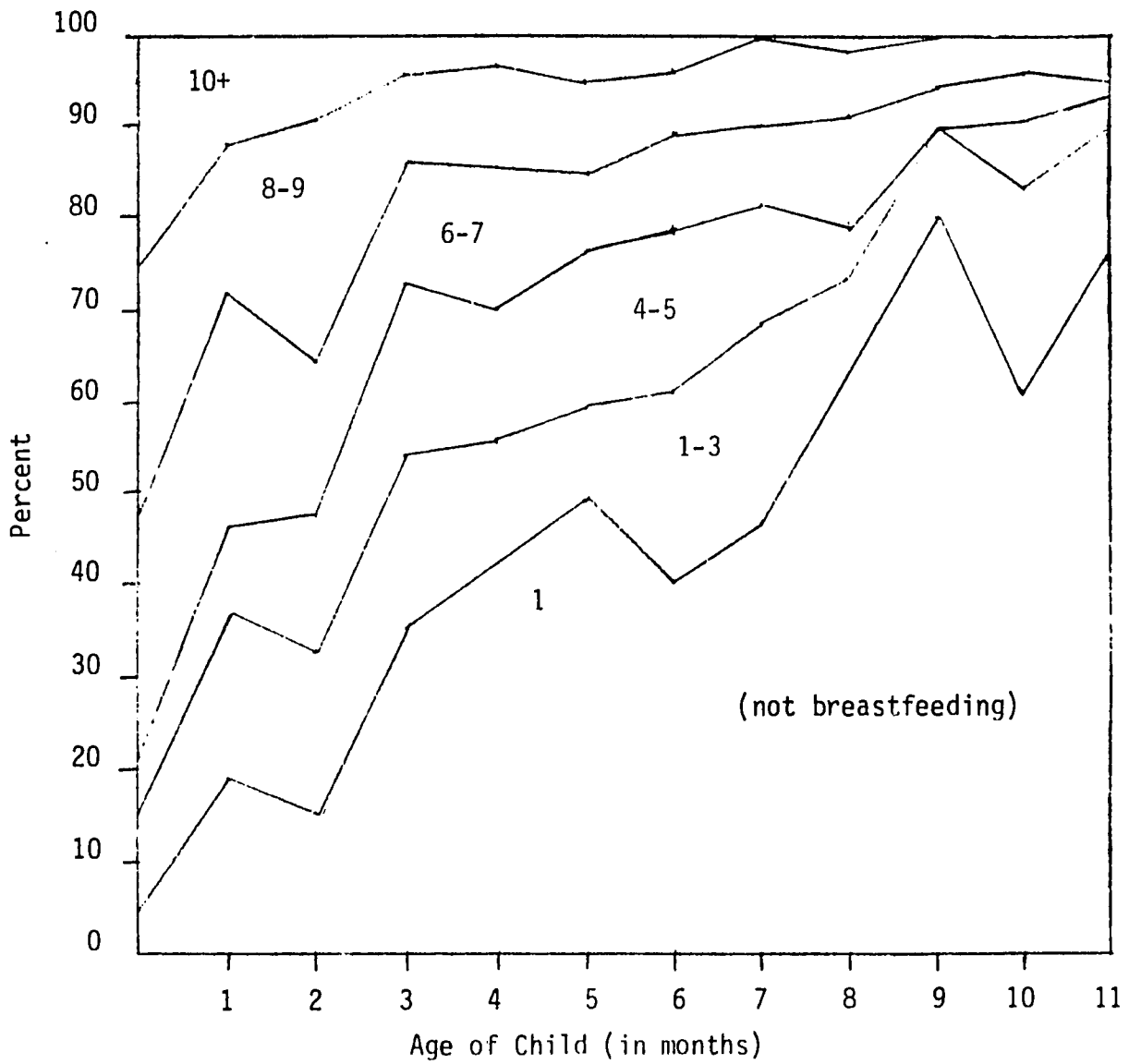
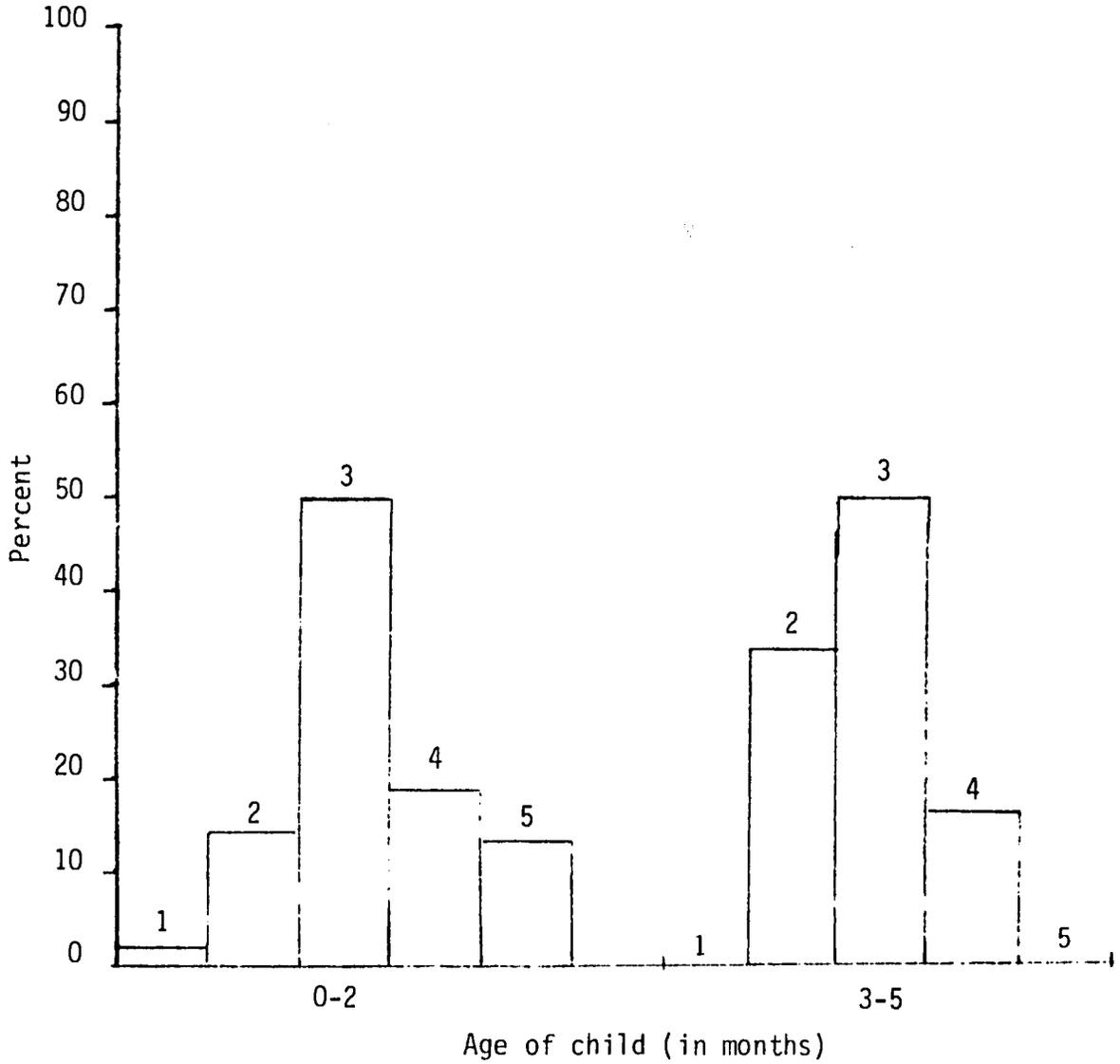


Figure 4-5

Number of Daily Breastfeeding Episodes
Among Exclusively Breastfeeding Women for Children Under Six Months



Key:

1 = 4-5 episodes per day

2 = 6-7 episodes per day

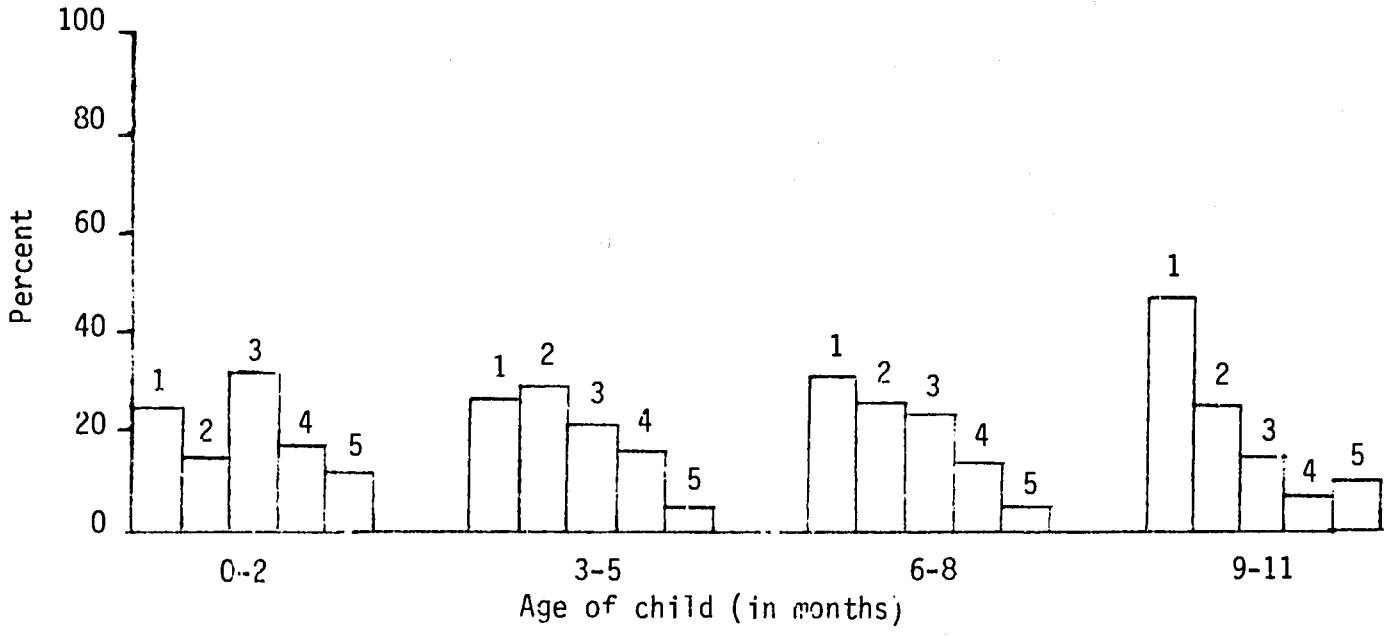
3 = 8-9 episodes per day

4 = 10-12 episodes per day

5 = 13+ episodes per day

Figure 4-6

Number of Daily Breastfeeding Episodes
Among Non-Exclusively Breastfeeding Women



Key:

1 = 2-3 episodes per day

2 = 4-5 episodes per day

3 = 6-7 episodes per day

4 = 8-9 episodes per day

5 = 10+ episodes per day

CHAPTER V INFANT FEEDING PRACTICES: DETAILS OF SUPPLEMENTATION

Table 3-2 above, presented the infant feeding patterns according to seven possible combinations of breastmilk, food and bottle use according to the ages of the index children. The most significant finding is that the change from an exclusive maternal milk diet to one with other supplements, i.e. other milks and/or foods, proceeds very rapidly. Thus the vast majority of infants are receiving supplementary foods. In Figure 5-1, these infants can be categorized as (1) those receiving breastmilk and supplementation and (2) those who are completely weaned. Completely weaned infants comprise 42.1% of the overall sample, and partially breastfed infants account for 49.1%.

Figure 5-2 shows the overall pattern of supplementation, comparing partially breastfed infants with infants who were not breastfed. The most common pattern of supplementation across all age groups is a mix of breast milk substitute and foods. This pattern is seen in 40% of breastfed infants 0 to 2 months of age and over 95% of non-breastfed infants 9 months or older.

Supplementation with bottle feeding only is common (over 30% of infants) in the youngest age category, but represents less than 5% of infants in any other category. Between 25% and 35% of the breastfed infants are supplemented only with food, but this is true for less than 5% of non-breastfed infants, reflecting the fact that few infants are offered a diet with no source of milk whatever. After the first 3 months of life, two patterns become most prevalent: breastmilk substitutes with other foods either in addition to or without breastmilk.

Figure 5-3 shows the percentage of the entire sample that is currently bottlefed or consuming other foods by current age of child. Initiation of bottles and foods occurs very early, with over 60% of the sample receiving both before the end of the second month of life. Use of foods is more common than bottle feeding at all ages except for the first and second month of life. Among children four months or older, the percentage of children bottlefeeding and consuming foods is high and fairly stable. This is consistent with the data indicating that initiation of supplementation usually occurs before that time, i.e., by the end of 3 months.

Table 5-1 demonstrates, for supplemented children, the average age a child received its (1) first supplementation of any non breast milk substance; 2) first breastmilk substitute and (3) first non-milk foods for four age groups. On the average, supplementation with a breastmilk substitute precedes supplementation with non-milk foods by one-half-to-one-month. Children aged 0-2 months on the average received their first

supplement during the first month of life. The first two age categories are affected by the younger age of the infants and the fact that some infants in the age group had not yet begun supplementation. However, the comparable values obtained for the 6-8 and 9-11 age categories suggest that these represent an accurate picture of the average age at first supplementation for the whole population. According to Table 5-1, the average age for initiation of any supplementation is just under 2 months.

Percentages of children who are currently fed foods and breastmilk substitutes among weaned (Figure 5-4) and currently breastfeeding (Figure 5-5) children are shown. As expected, both food and breastmilk substitutes use are greater for weaned children 0-2 months than for those who are still being breastfed. One hundred percent of weaned children received bottles at 0-2 months, and the use of bottles remains above 90% for the entire year. Forty percent of breastfeeding infants received a bottle at 0 months, reaching 65% at 1 month and fluctuating between 65 and 79% through the eleventh month, when there is an increase to over 90%.

Generally, foods appear to be universal around 7 months of life. Ethnographic data corroborates this; women stated that at age seven months most children "eat anything." At this time, steamed vegetables, meat, chocolate, strained fruits and juices replace liquid varieties.

Combinations of milk and food or diluted milks fed in bottles complicates any assessment of the relative contribution of supplementary milks versus other foods to shortening the weaning period. According to the Colombian research team, 46% of the people in charge of feeding the index children diluted their milk preparations[1].

The additions to milk preparations fell into three major categories:

1) Liquids (sugar water, herb water or vegetable water).
2) More water than producers indicated for infant formulas.
3) Replacement of part of powdered milk with flours (plantain, corn, etc.) and sugars.

This agrees with cross-sectional data which show that 78% of the women believe liquid food is more nutritious than solids.

---

[1]In "Infant Feeding Practices Among Low and Middle Income Families Residing in Bogota, Colombia, B. Samper de Paredes et al, December 16, 1982, Javeriana University.

The ethnographers state that the mothers report 174[2] different ways of preparing milk according to the type of milk used (powdered formula, powdered family type or liquid milks) and other ingredients added. Only 23% of milk preparations were liquid milk alone or powdered milk mixed in water. The remaining 77% of the preparations had one or more additional ingredient.

- 50% used sugar (30% refined, 20% unrefined brown sugar block).
- 26% flour cereal or with vegetables.
- 16% water made with herbs, vegetables or fruits.
- 12% plantain flours.
- 5% vitamin drops.
- 1% others (egg, coffee, chocolate, butter, etc.

Some of these additions appear to be nutritious and are probably, at the worst, harmless to the infants. Others are clearly added to stretch the milk and bring into question whether infants are receiving adequate food. For example...

> "...the powder milk brand XX now costs 200 pesos a can in my neighborhood. It is a good thing the can lasts all week, but to do so I add vegetable water and brown sugar block; if not, the milk would barely last 3 days..."

Preparation and handling of bottles have important implications for the health effects of choosing this method of feeding infants. Although much of these data are difficult to evaluate, 63% of the respondents state they wash out their infants' bottles, in some way, before and after every meal. Twenty-four percent, however, state that bottles are washed only once or twice a day. The ethnographers quote one woman who does not use soap to clean her child's bottle because "...it is irritating and may be harmful to the child..." Health education, of course, might increase the bacteriological safety of bottle feeding, but the difficulties involved in heating water for families who share faucets, or who must haul water daily from other reservoirs and for those using only hotplates or wood fuel make hygienic artificial feeding impractical for many.
The preparations added to bottles and their differential cleanliness are important issues discerned in the case-study of women in all three sectors.

One woman mentioned that she had not tried bottle formula although her neighbors use it, mostly because she is unsure of preparation. Her friends use two tablespoons of milk in water to prepare an eight ounce bottle. A druggist in sector I stated that the people in his neighborhood used very little formula milk

---

[2]Page 8, "Infant Feeding Practices," Sampes de Paredes et al Op. cit.

with brown sugar water--a practice which, in his opinion, contributes importantly to malnutrition in this sector. Women in sector III indicate that children drink canned milk and commercially processed foods such as oatmeal, cornstarch, CERPI, etc. The dilution of these preparations is widespread:

> "...The bottles of the older children are now prepared by combining in a pot that holds enough for six bottles: four teaspoons of formula, cornstarch, cinnamon and sugar..."

Indeed, cornstarch appears along with brown sugar to comprise a major portion of children's (and mothers') nutritional intake. These non-nutritive bottles may adversely affect the child's interest in breastfeeding.

Poor women in sector III use formula milk in much greater quantities than poor women in the other sectors. Consequently, the ethnographers suggest that sector III children are at greater risk for diluted formulas, less breastfeeding and the sequelae of poorer health. It is particularly important to target poorer mothers in a public health campaign to encourage prolonged breastfeeding and discourage the spending of already strained income on the purchase of formulas and packaged foods.

Overall, however, it is the middle and lower middle class women in sector II who spend a greater proportion of their income on infant formulas and processed foods than other women. Yet, here bottles were boiled and a major problem of dilution with water was not observed. The addition of brown sugar or apple or vegetable (spinach and carrot) water appeared to be for taste, nutrition and aesthetics rather than as a way to conserve the milk product.

Figures 5-6 and 5-7 show patterns of food intake among children currently receiving non-milk foods, by age groups. As can be seen (Figure 5-6), by the third month, 50% or more of the children were being given juice, fruits, vegetables, grain, sugar and meats, fish or eggs. The primary foods introduced by 2 months are fruits, vegetables, juice and sugars(Fig. 5-7). All food categories, except juice, show a tendency to be used more frequently by older children. The ethnography indicates that a whole range of foods is introduced periodically throughout infancy, often in diluted form using a bottle. The ethnographic data are replete with discussion of food types, qualities, and tastes, which indicate the importance of food supplementation among the various classes and sectors in Bogota.

The poorest women in sector I use starches, flours and sugar as supplements. The druggist in this sector indicated that formula milk is most often diluted with brown sugar water.

"...Brown sugar is considered to ...enhance the calcium in the body, since brown sugar contains calcium-lime, and this is good to "calcify..." Brown sugar is better than refined sugar because refined sugar causes acidosis..."

Sugar is an item of significance among Bogota families. It appears to be a major food source for both adults and children. In some sectors, this use is so extensive that panela, brown sugar loaf, is purchased wholesale. In the 17th century, large scale production of sugar began for both export and self-consumption, throughout South America, and Colombia is the world's third largest panela producing country. Given its history, it is not surprising that Colombians view panela as an item of direct consumption as well as having medicinal properties. Sugar was used as a medicine in ancient Arab pharmacology. It entered Europe as both a spice and a medicine, where it was commonly prescribed with combinations of foods.[3] The ease with which sugar can be combined with other foods, especially in liquid form, is well appreciated by the Bogota mothers.

The fact that 30% of the infants in the sample are ingesting sugar before two months of life (rising to 80% at nine months) is alarming for several reasons. First, is the high level of adulteration, toxicity and contamination in panela. There appears to be no quality control in its production. Dye, textile aniline and lime are used in its processing.[4] In addition, refined sugar and additional dyes are used to produce the grade 1 panela, which is whiter and, apparently, aesthetically preferable, although containing greater amounts of toxic substances. There is a general lack of hygiene in production, packaging, storage, and distribution of the product.

Secondly, of course, the nutritional content of panela is poor. The public health issue here is large, and poor women should be encouraged to increase breastmilk feedings and eliminate other milks. If bottle milk is used and it is culturally imperative that additions be made to it, supplements other than refined sugar should be encouraged.

Optimistically, many Bogota mothers are aware of the superior qualities of foods such as root vegetables, grains,

---

[3]The source of discussion of sugar is from Sidney Mintz, Sweetness and Power, 1985, Viking Press, N.Y.

[4]Information on adulteration and unsanitary conditions of the industry is from: "The Food Industry in Bogota," by Morales de Look at al, Javeriana University, 1982., p8. Report to the Population Council.

cereals, fruits and juices. Strategy should, therefore, focus on how to enable poor women to increase their infants' intake of preferred infant foods, such as vegetables, grains, and meats and to decrease panela use. Panela is a relatively cheap food and its significance is largely related to poverty. If women had sufficient resources to include a wide range of nutritious food in their infants' diets, they would do so. Perhaps, then, such large amounts of panela would no longer be necessary.

Some women in all sectors indicated that one must prepare the baby's stomach for consuming table foods. The preparation consists of garlic in water, with milk, onion and cumin, coriander and so on. It is given to a child to clean out the stomach. After the cleansing preparation, the first things a child eats are eggs, juices and soups, cornstarch or oatmeal. Ideally, a child is given, at two or three months of age, an egg with cow's milk, brown sugar water and corn. At four months, corn or soup is given with a spoon. Ground chick peas, lima beans, wheat, barley, and corn are added to the soup. A variety of grains, cereals, and vegetables are prepared strained and fed by spoon to the children. One of the grandmothers in sector I recalled how years ago a "seven grains bottle" used to be made (i.e., with rice, barley, wheat, chickpeas, split peas, corn and lettuce) and fed to infants. The "grains" were mixed together, toasted and pulverized, and the flour was kept to be added to soups, broths and cows milk. Today, according to the ethnographers, soups, strained foods and the like were not fed to most children of women interviewed in sector I.

Soup is a culturally preferred infant food, which is considered nourishing, is boiled, and therefore more hygienic and fills up the stomach better than dry food. This is consistent with humoral theories, where cold food is avoided for children since they would catch cold and get stomach aches. It must be remembered, however, that characteristics of cold and hot are mostly related to the type of food and not the temperature. The local pharmacists also advise against giving cold foods to children. "Cold" foods are those which are heavy to the child's stomach, e.g., apple, potato, rice soup, cabbage, pork meat, avocado and the like.

Attitudes regarding appropriate foods for children differ little among women, herbalists and pharmacists. Indeed, women in all sectors feel that soup is a nourishing food for children, although its quality is contingent upon available money. In this regard, women appear to be somewhat knowledgeable about nutritive value. A certain amount of this knowledge exists among even the poorer women. For example, a woman, who works intermittently, feeds her children soup with recadito (a seasoning mixture which includes cilantro etc.) and soup bone, although she would like to give her children vegetables, lentils and green beans. Once a week, she feeds her children chicken soup.

It is clear, and the ethnography validates this, that most women in all sectors believe that bottle milk preparations are not nutritious enough by themselves. Women in sector I admit that in order to conserve formula or canned milk, they dilute it with sugar, corn or plantain starch and other ingredients, including cinnamon for digestion.

Most of the sector II women think commercial foods are not as good as fresh products, however, artificial milk, gelatin and processed foods are used even by poor women in this sector. This is especially so for mothers enrolled in the food coupon program and who acquire items such as Colombiarina and Superbaby. Middle and lower middle class women in sector II also use homemade foods but have been encouraged to use commercial preparations and formulas through their experience with hospitals and health centers. As expected, the use of starches and flours mixed with milk is minimal among the better off sector II mothers. Mothers here begin giving liquid foods very early, as early as day one of birth. They include banana pap, vegetable soup, guava, carrot, apricot juices and fruit pap. Sometimes Ceralac, Nestum or Vitaplanto are added to the fresh fruit pap bottles. The diets are more varied and include more proteins and a wider range of fruits and vegetables then in the diets of poor children from sectors I and III, in accordance with greater disposable incomes. Liquified meat, tangerines, grapes, cucumbers, egg yolk, vegetable milk, along with commercial fruit paps or soups are given as a supplement to breastmilk. Sector II case study women appear to introduce foods first and then add other milks.

In summary, it appears from the case studies that many mothers are aware of aspects of appropriate nutrition and food supplementation. The degree to which the adequate combinations of proteins, carbohydrates and fats are served to infants varies with income of the women in all three sectors. In all sectors, women used bottles for liquified foods and added foods to formulas in varying degrees. Naturally, the use of starches, flours and sugars was much higher among the poorer classes. The use of bottles (for artificial milk or foods) presents a serious public health problem, not only in terms of microbial contamination, but in the potential for destruction of childrens' teeth through the "nursing-bottle syndrome." It is the major cause of caries and premature loss of deciduous teeth. Milk or formula can produce this picture because of the lactose present. Milk with panela and cornstarch or juices may produce an even more marked picture.

Infant feeding regimes, choice of foods, the ability to provide clean bottles and undiluted milk all vary among women of different classes, ages, and degree of intergenerational contact. These social, economic and cultural variations among

the Bogota mothers will be evaluated in the following sections as possible determinants of infant feeding practices.

Table 5-1 Average Age for First Supplementation, First Bottle, and First Foods by Age of Child

Age (Completed Months)	First[3] Supple.	First[1] Bottle	First[2] Foods
0 - 2	.41	.39	.83
3 - 5	1.20	1.11	2.24
6 - 8	1.76	2.07	2.84
9 - 11	1.73	2.20	2.83

[1]First bottle refers to age at which child first received breastmilk substitute on a regular basis.

[2]First foods refers to age at which child first received foods other than milk on a regular basis.

[3]First supplement refers to age at which child first received any milk or non milk food other than breastmilk on a regular basis.

Figure 5-1

Percentages of Children Receiving Various Feeding Regimes

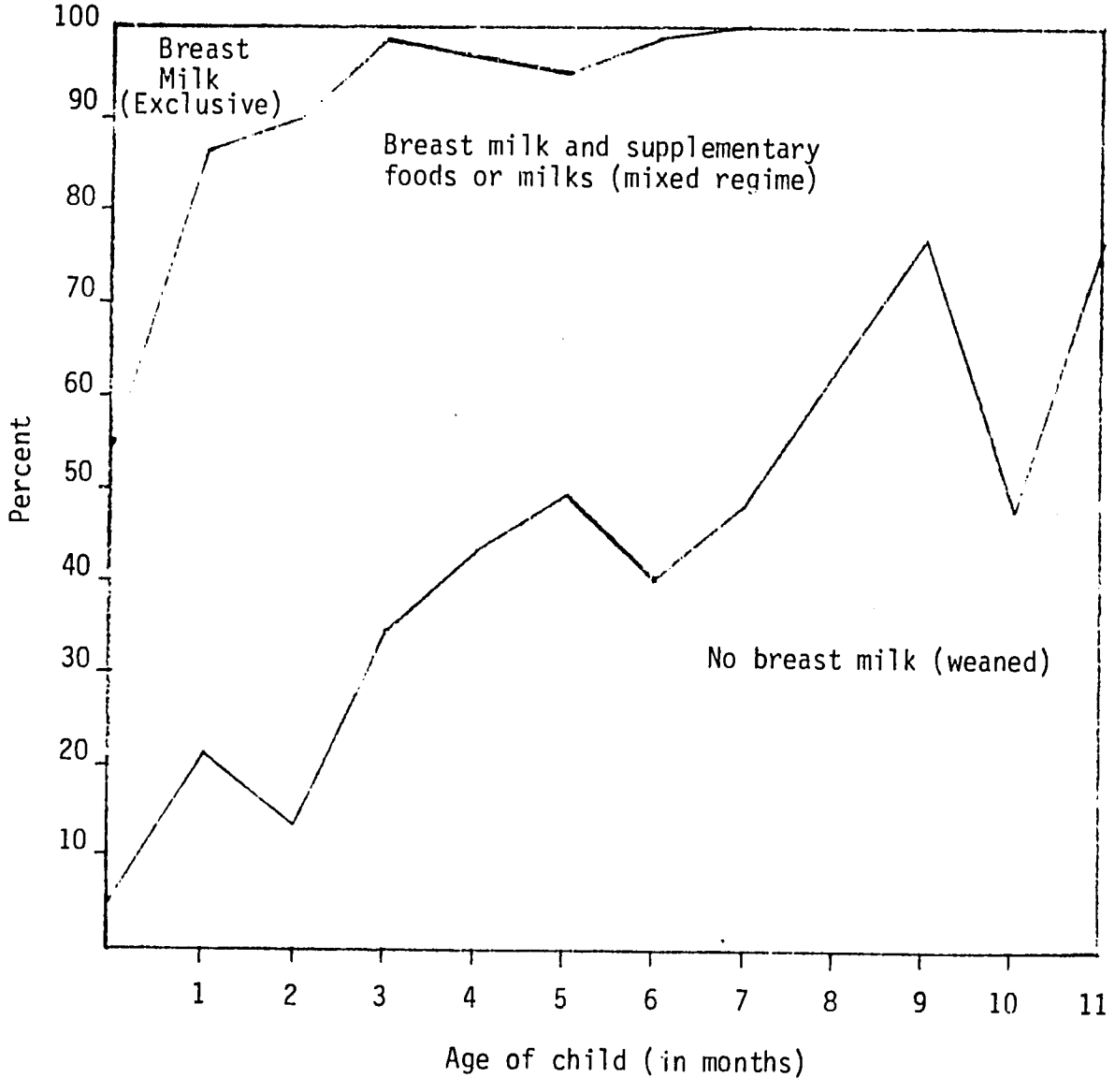
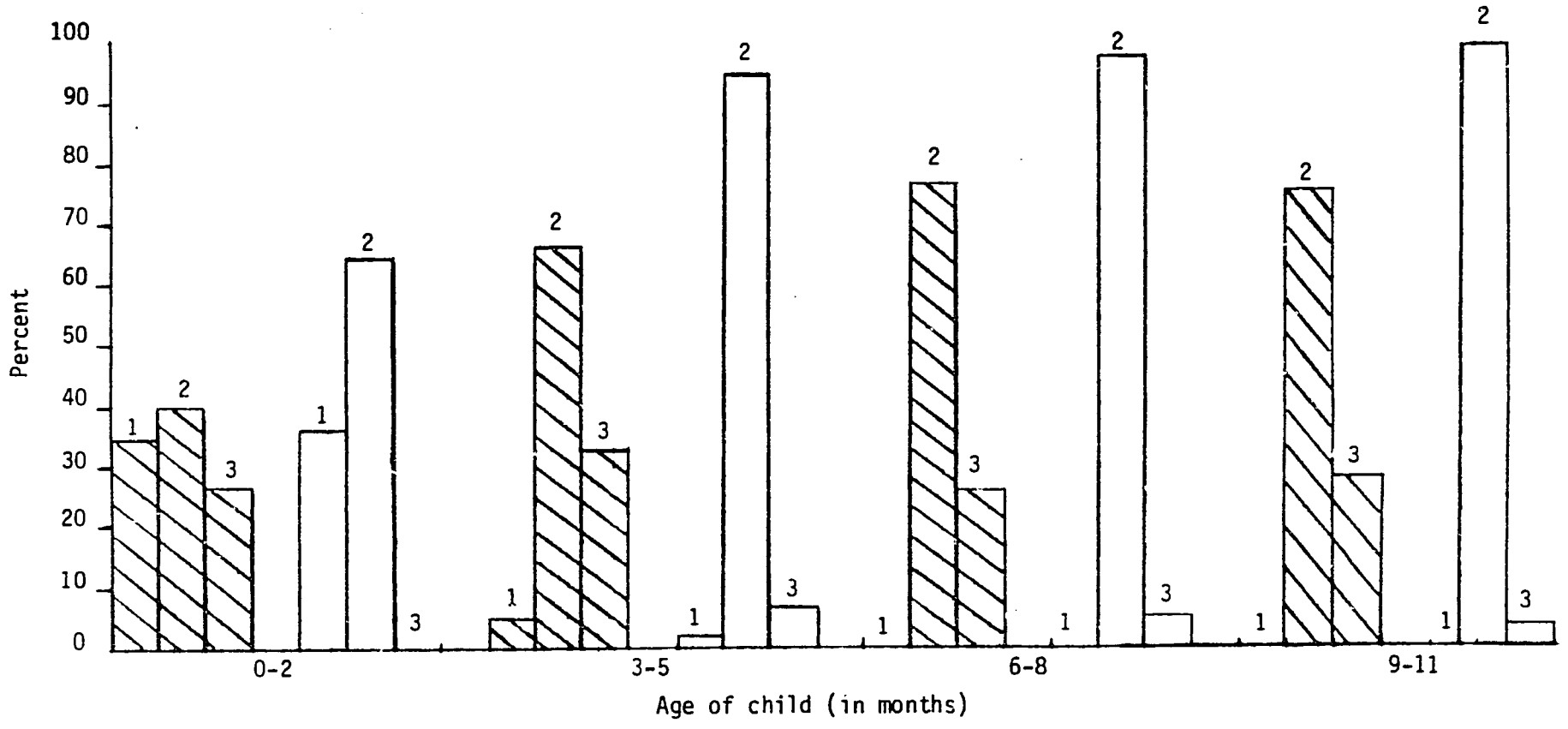


Figure 5-2

Pattern of Supplementation for Breastfed Children
Versus Non-Breastfed Children



Key:

1 = Breast milk substitute only

2 = Breast milk substitute and foods

3 = Foods only

Not breastfed

Breastfed

Figure 5-3

Percentage of Children Currently Bottle Fed and Consuming Other Foods by Age of Child

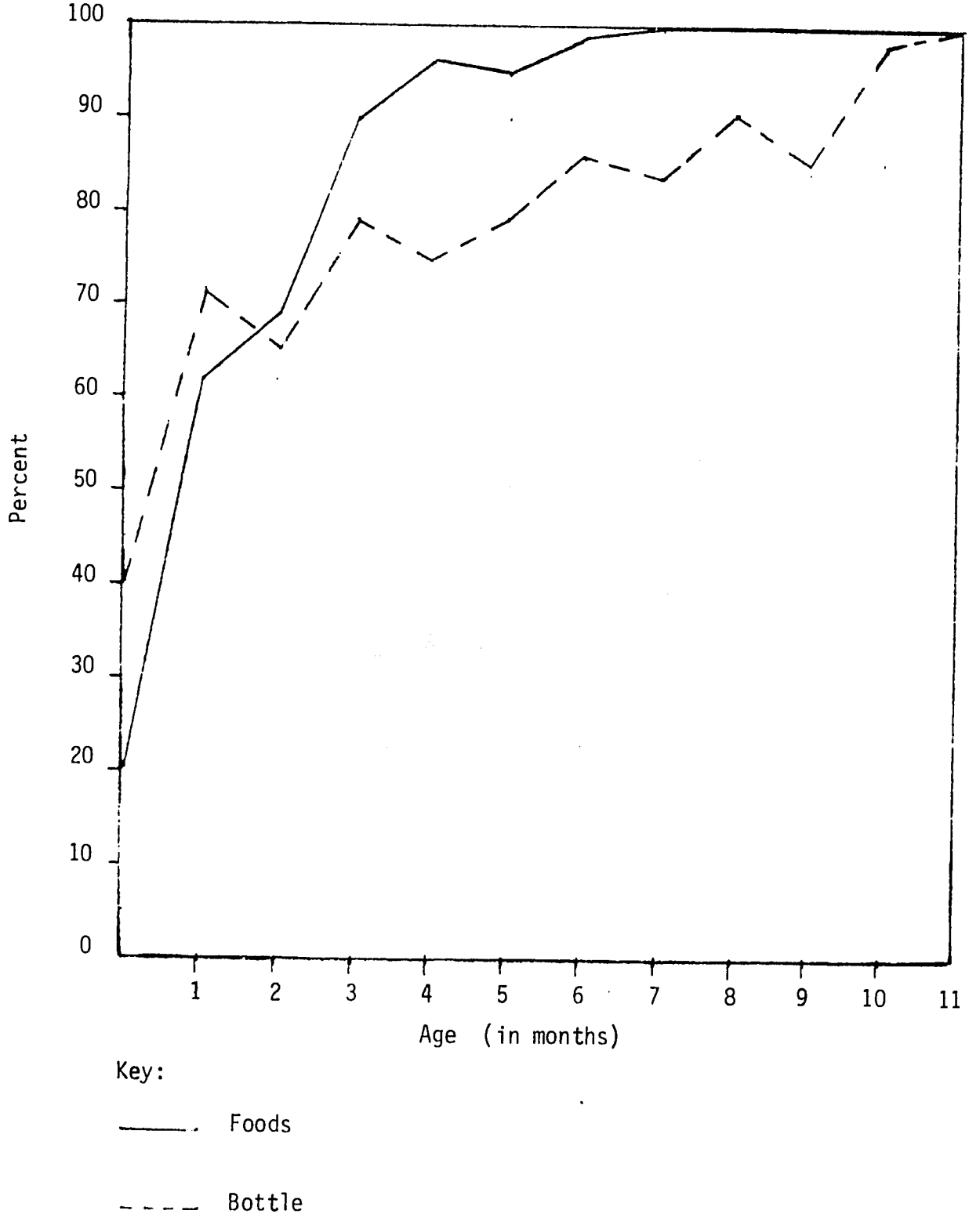
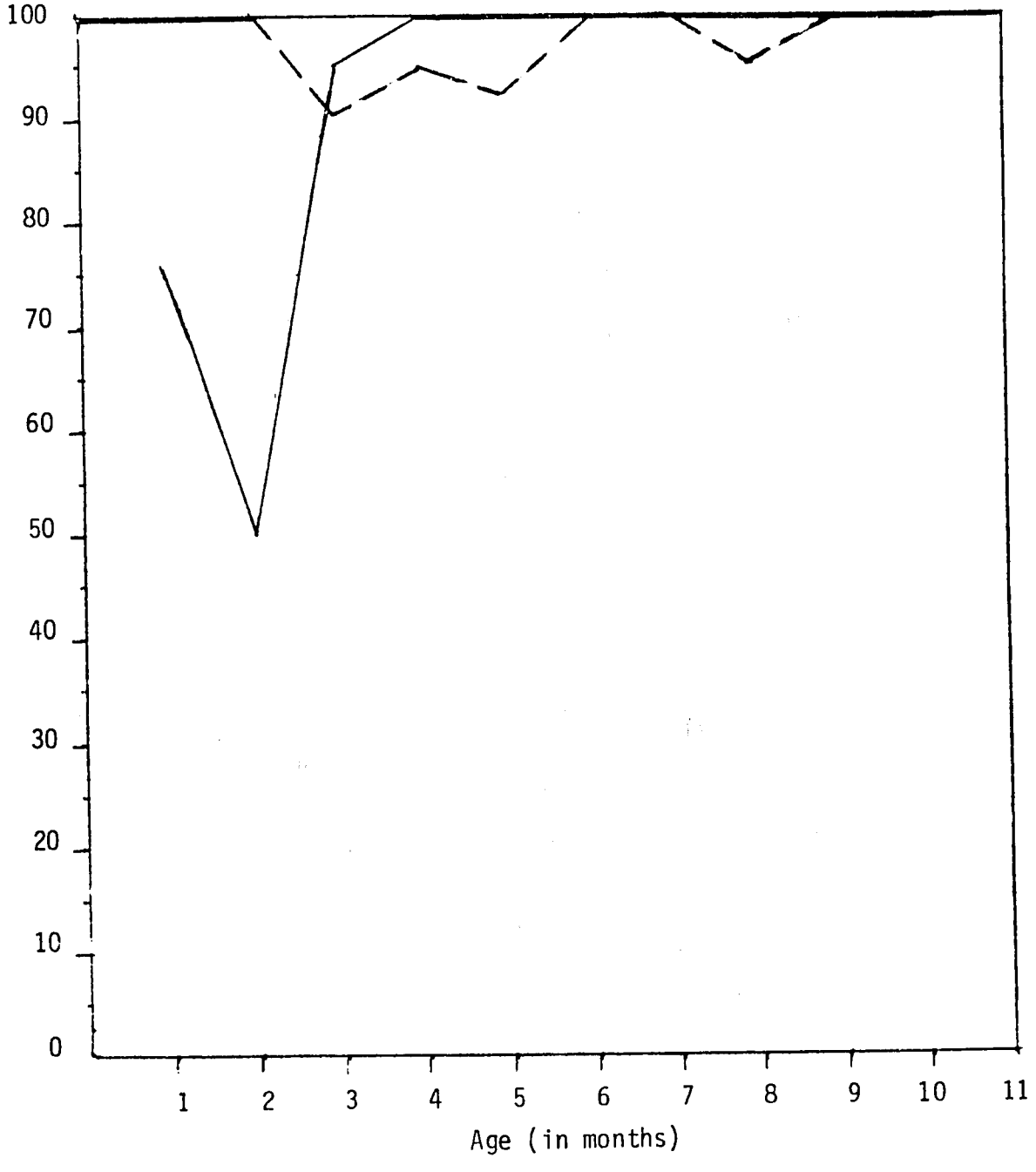


Figure 5-4

Current Use of Breastmilk Substitutes and Foods Among Ever Breastfed but Stopped Children by Age of Child



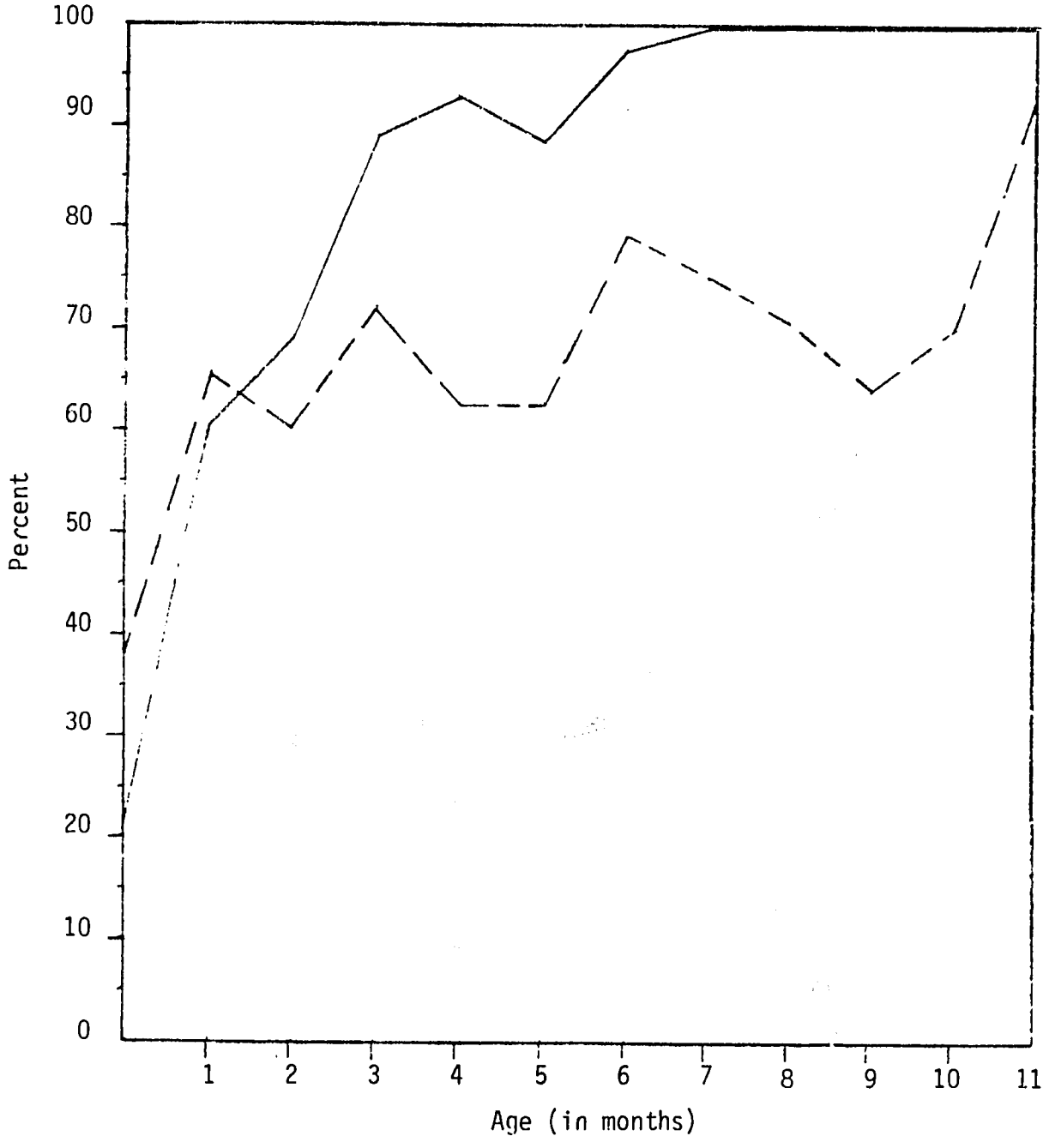
Key:

—— Foods

- - - - Bottle

Figure 5-5

Current Use of Breastmilk Substitute and Foods
Among Currently Breastfeeding Children by Age of Child



Key:

——— Foods

- - - - Bottle

Figure 5-6

Percentage of Children Receiving Varieties of Foods by Age of Child

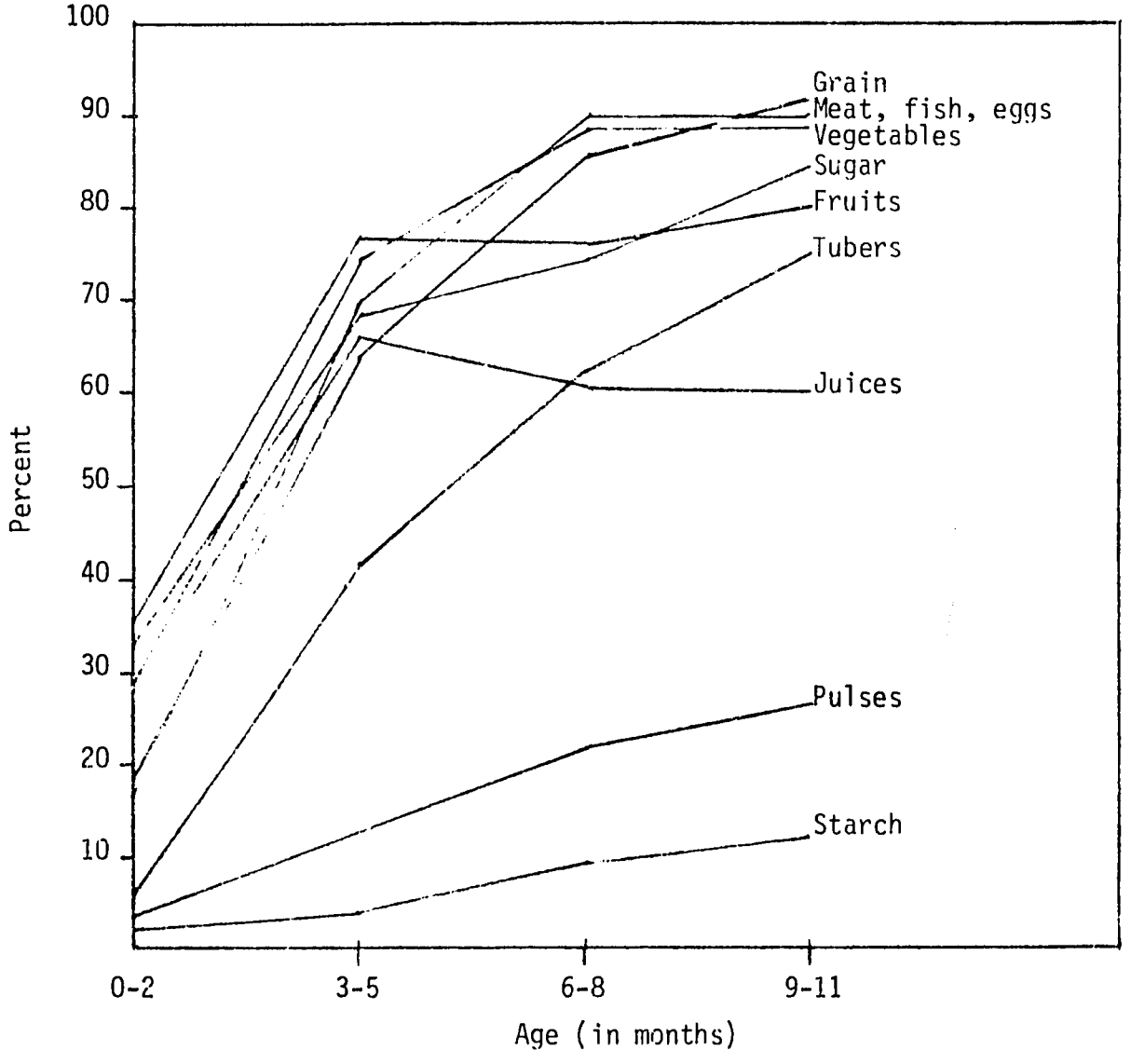
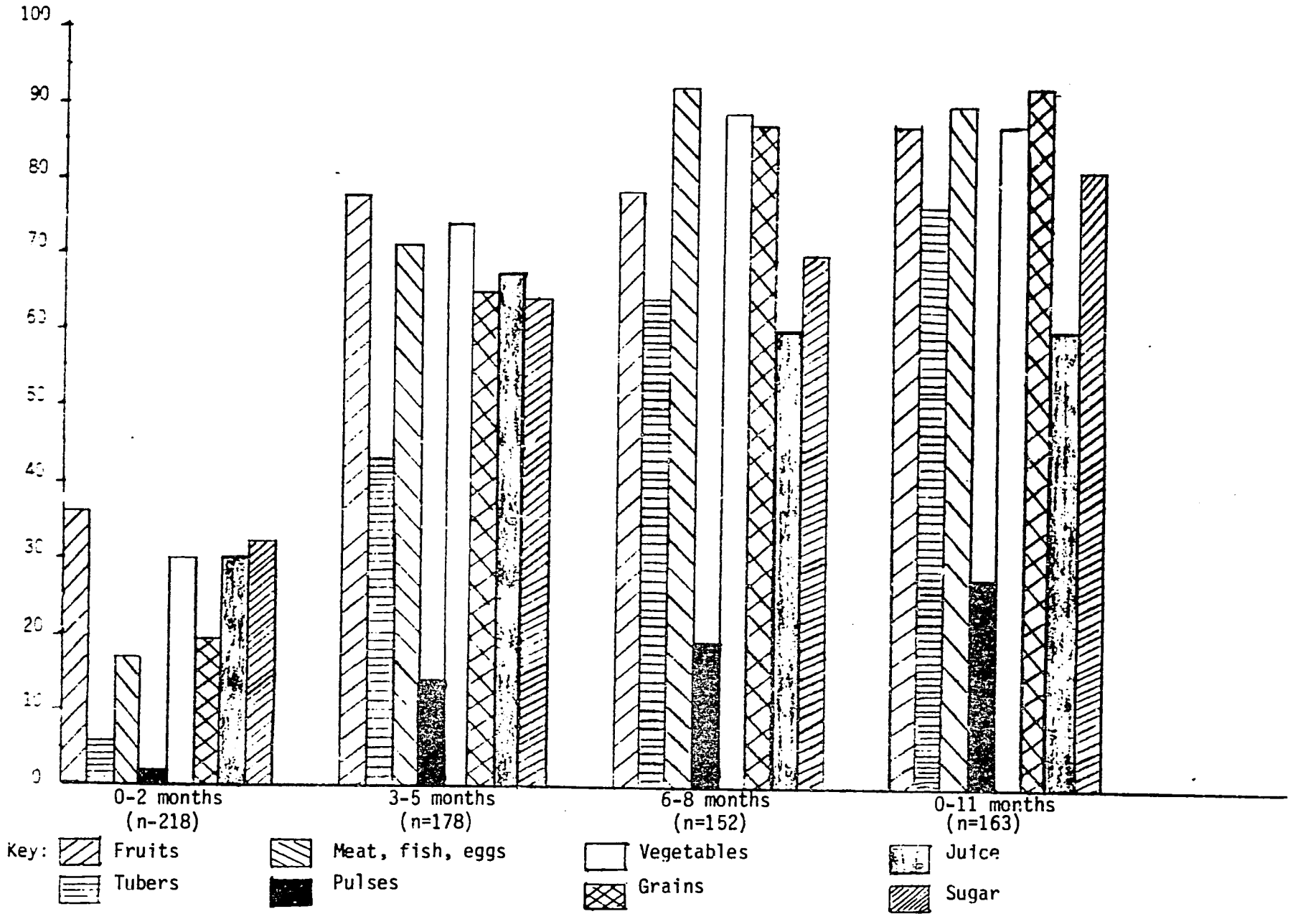


Figure 5-7

Percentage of Children Consuming Different Foods by Age Group



Chapter VI DETERMINANTS OF INFANT FEEDING PRACTICES: BACKGROUND VARIABLES

In order to present a picture of the importance of various determinants of infant feeding choices among Bogota mothers, this and subsequent sections of the Colombian report will explore the interaction of background socioeconomic variables and variables representing health services, women's employment and commercial marketing. Logistic regression is used to evaluate the effect of the various independent variables on infant feeding behavior.

Two sets of dichotomous dependent variables were chosen to represent infant feeding outcomes in the Bogota sample. They represent breastfeeding duration and age at initiation of bottle feeding (use of a breast milk substitute). The breastfeeding duration variables include whether a woman did or did not initiate breastfeeding (Ever Breastfed) and whether breastfeeding did or did not continue through the third, sixth, and ninth months' of the infant's life. Those infants who had not reached the specified age at the time of the survey were not included in the calculations, and so, do not affect the results of the regression analyses.

Bottlefeeding behavior is represented by two variables: introduction of bottlefeeding by one completed month of age and introduction of bottlefeeding by two completed months. These intervals (1 and 2 months) represent the introduction of early use of breastmilk substitutes. The two bottle feeding variables were chosen to maximize their predictive power in the case of early weaning and to examine whether early bottlefeeding is associated with maternal complaints of insufficiency of breastmilk.

The independent variables used in the analysis fall into three groups. Since prior infant feeding research has shown the importance of general socioeconomic characteristics on infant feeding behavior, a set of background socioeconomic variables is first examined and a regression model fitted. The next two sections deal with the effects commercial marketing, maternal employment and health services have on infant feeding choices.

Five variables indicative of the general socioeconomic backgrounds of each of the index mothers were chosen: mother's age, parity (defined as the birth order of the index child), mother's birthplace, years of schooling, and family income. Mother's birthplace was chosen to serve as an indicator of the type of background from which the mother came. This choice was thought to offer a measure of the degree of urban orientation of the mother, in-so-far as less urban birthplace might tend to be associated with more traditional infant feeding. Table 6-1

presents variations of infant feeding choices according to these five socioeconomic categories.

The Ever-breastfed category in Table 6-1 does not exhibit any systematic trend with socioeconomic variables. Breastfeeding is almost a universal practice in Bogota (approximately 90% in all strata), however, and none of the socioeconomic categories have more than a limited effect on initiation of breastfeeding.

The cross-tabulations in Table 6-1 suggest a need for further analysis of the role of mother's education in infant feeding. A change is discernable at 11-12+ years of education where such mothers appear less likely to introduce early bottle and more likely to breastfeed longer durations. This is in contrast to findings in other developing countries, and more similar to patterns seen in Western Europe and North America. It may reflect a high level of concern about nutrition in Colombia over the last decades, or the reflection of trends in developed countries among higher socioeconomic groups in Bogota. The data on mother's place of birth suggest there may be less differences in feeding behavior than expected. The notion that migrants hold more traditional values (i.e. should bottlefeed less and breastfeed more) is not substantiated. Migrants to Bogota, however, come from other cities or towns and, generally, not from the countryside. The use of bottles for non-milk liquid foods is widespread, except among the older generation, and may be already accepted by these migrant women before they arrived in the capital.

Increasing family income appears to be, in general, inversely associated with breastfeeding duration. Women of the highest parity appear to breastfeed longer than other women. Bottlefeeding is prevalent in all categories, however, with about one third using bottles by the end of the first month and almost half using bottles by the end of the second month. From the data presented in Table 6-1, parity, increased schooling of the mother, and family income appear to be good candidates for predicting feeding outcomes in the study population.

Although the indicators breastfed 3, 6 and 9 months can be used to assess the numbers of children who have breastfed for 3 specific durations, additional information about breastfeeding duration can be obtained from the analysis of lifetables. Figures 6-1 through 6-5 contain the results of such survival analyses, grouped separately for each of the preceding socioeconomic variables. Separate plots are presented for each category of each variable, indicating the proportion of children in that sub-group still breastfeeding at each month. The median duration of breastfeeding, expressed in months, is also shown for each sub-group.

The data indicate that greater family income (Figure 6-1) is associated at nearly every age with a lower percentage of infants breastfeeding with median duration increasing successively in each higher income group. The lifetable of mother's place of birth (Figure 6-2) shows, for each age group, that Bogota-born mothers breastfeed for slightly shorter durations than migrants to Bogota. In the lifetable of mother's schooling (Figure 6-3), beyond the 3rd month, the few women with 13 years or more years of education show consistently longer durations of breastfeeding than most other groups. It is also apparent from Figure 6-3 that fewer women in the 2nd highest education group continue to breastfeed than mothers in all the other categories after the fourth month of life. Median durations are quite similar in all groups except the highest and lowest, where they are longer.

Figure 6-4 is a lifetable by age of mother and shows no consistent trend by age, although the very oldest mothers tend to breastfeed for the longest. The life table 6-5 for parity also shows no consistent trend.

The preceding cross-tabulations and lifetable analyses give an indication of the existence of associations between infant feeding behavior and a set of socioeconomic variables. To evaluate the individual effect of these variables on specific infant feeding outcomes, while controlling for interaction among the predictors, it is necessary to use a form of multivariate analysis; logistic regression. The dichotomous dependent variables used in the models reflect 6 infant feeding outcomes of interest. The logistic regression procedure permits evaluation of the effects of individual predictor variables in each of the models.

Table 6-2 shows six separate models in which the dichotomous infant feeding variables are the <u>dependent variables.</u> The set of beta coefficients and associated chi-square test provide an indication of which of the predictors exert a significant effect on the probability of the infant feeding outcome under consideration. None of the individual predictors by themselves is significantly related to the dependent variable Everbreastfed. This lack of effect is consistent with the fact that virtually all mothers in Bogota initiate breastfeeding. The duration variables for three and nine months also have no significantly associated background variables, however, duration of nine months is associated with lower family income. These results are consistent with ethnographic data which indicates that many lower income women live on credit, have little (if any) disposable cash, and tend not to rely on purchased "bottle" milks as the sole source of their child's milk. Moreover, lower income women have minimal contact with the formal health sector and may, therefore, be less exposed to external tendencies promoting early cessation of breastfeeding in favor of artificial milks. Some of

these factors will be discussed in the health services and commercial marketing sections of this report, below.

The model of the determinants of bottlefeeding by 1 and 2 months shows that the predictors exert a greater effect on these outcomes than on breastfeeding durations. Within each model, introduction of bottlefeeding is negatively related to mothers education, signifying mothers with more years of schooling are less likely to bottlefeed early. This may mean that more educated women may have greater access to information available in Bogota regarding the advantages of early, exclusive breastfeeding. Lower parity and higher maternal age both increase the likelihood of introducing an early bottle, since the model controls for all other variables when assessing the effects of each predictor. This finding may imply that women who postpone childbirth (older women with fewer previous children) are more likely to introduce bottlefeeding by one month of age. This was corroborated by examination of the group of women over age 35, with one child: 81% of this subgroup introduced a bottle by 2 months as compared with 47% of all other women.

Since interpretation of the magnitude of effect represented by beta coefficients is not readily apparent, the preferred method of quantifying and comparing the effects of the predictor variables is to calculate the adjusted risk odds ratio (RoR) for each significant predictor. This ratio represents, for each variable, the probability of a given outcome divided by the probability of the alternative. Table 6-3 shows RoRs and 95% confidence intervals for each of the predictor variables of significance in the preceding table.

Although some predictor variables are dichotomous (e.g., mother's birthplace, i.e. born in Bogota or elsewhere), others are arranged on an ordinal scale (e.g. mother's age, income etc.) and grouped. For those continuous predictor variables, a series of representative odds ratios are presented. In each of these instances, comparisons are made between a reference category and other representative categories for the variable under consideration. We chose the modal category (i.e. the group with the greatest frequency) as the reference category for each of the continuous or ordinal variables.

From Table 6-3, women in the modal category for income are only 31% as likely to breastfeed to 9 months as women in the lowest income category, and the highest-income women are 31% as likely to breastfeed for 9 months as women in the modal income category. In the models bottle by 1 and 2 months, women in the modal category, with 5 to 7 years of education, are 81% and 75% as likely to introduce a bottle by 1 and 2 months, respectively, as mothers with 1 to 4 years of schooling. The RoRs for the other significant variables in the models are interpreted similarly.

Earlier, it was calculated that in Bogota weaning intervals are generally less than two months. This means that the time of introduction of supplements to the child's diet should be a good predictor of breastfeeding behavior in subsequent months. While bottlefeeding variables were used as dependent variables in the preceding multivariate analysis, they may also serve as independent predictors of breastfeeding duration. The lifetable, Figure 6-6 supports this contention. Early bottlefeeding has the consistent effect of lowering the percentage of children in a given age cohort who are breastfed. Moreover, it has a fairly uniform effect across all age categories. Figure 6-6 reveals similar effects for introduction of bottlefeeding by the second month.

Since early introduction of bottlefeeding may be an independent determinant of breastfeeding duration, it was decided to expand the socioeconomic predictors to include use of bottle by one month as one of the variables predicting the probability of breastfeeding for the three durations. The results of this addition (Table 6-4), show that early bottlefeeding is a significant predictor of the dependent variables breastfed 3 and 6 months with a significance level greater at three months than at six. Comparing Tables 6-2 and 6-4, introduction of bottle by 1 month somewhat increases the significance and magnitude of income on breastfed at 9 months, but otherwise affects the models very little. These results, for the introduction of bottle by 1 month, indicate that early introduction of a bottle probably has its greatest impact on the percentage of mothers who are still breastfeeding at the earliest reported period. Table 6-5 shows that women who introduce a bottle by 1 month are 29% as likely to be breastfeeding at 3 months in comparison to women who do not introduce a bottle by 1 month. However, by 6 months women who introduce a bottle by 1 month are fully 90% as likely to be breastfeeding at this duration as women who do not introduce a very early bottle supplement.

The question remains whether early introduction of the bottle in fact represents a conscious intention to wean on the part of the mother, in which case it inevitably would be associated with shorter breastfeeding. One way to test this is to create a second model, evaluating the effects of bottle by 1 month and the other background variables on the probability of breastfeeding for as long as six months. This was performed using a subset of the sample, consisting only of those children who <u>did</u> breastfeed for as long as three months (Table 6-5) to test the proposition that bottles by one month have an independent effect on probabilities of breastfeeding to 6 months even for those children who are not weaned immediately after introductions of bottles. When this analysis was performed, no significant effects were realized for any of the predictor variables, including bottle by one month. This shows that introduction of a bottle by 1 month is associated with the

category of children who were not breastfed after 3 months. It also suggests that the impact of bottles by 1 month on breastfed for 6 months is through the number of children who do not breastfeed for 3 months. Whether introduction of a bottle by 1 month was the cause for cessation or part of a maternal weaning strategy cannot be determined from the data.

It should be noted, however, that in the companion studies for Nairobi and Semarang, introduction of an early bottlefeeding variable did have a significant independent effect on the probability of breastfeeding for as long as six months. Therefore, the potential that introduction of early bottlefeeding could significantly influence longer breastfeeding durations does exist. As we saw in the details of breastfeeding section, the ethnographers documented instances where introduction of bottlefeeding was directly associated with subsequent unintended termination of breastfeeding. This confirms the need to consider early bottlefeeding as a feeding outcome and as a possible independent variable as well. This two-stage analysis involving bottle by 1 month will be employed again in a later section when development of an overall predictive model is considered.

Table 6-1(a) Initiation and Duration of Breastfeeding, and Introduction of Bottlefeeding According to Socio-economic Factors

	EVER BREASTFED		BREASTFED 3 MONTHS		BREASTFED 6 MONTHS		BREASTFED 9 MONTHS		BOTTLE BY 1 MONTH		BOTTLE BY 2 MONTHS	
	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%
Mother's Education												
None	14	87.5	9	90.2	6	100.0	1	50.0	5	35.7	6	46.2
1-4 years	145	98.0	60	71.4	31	59.6	9	37.5	48	38.1	58	50.9
5-7	256	97.0	116	75.8	53	54.1	15	32.6	75	32.6	104	50.5
8-10	159	98.8	66	68.7	27	50.9	8	29.6	46	31.5	66	50.4
11-12	81	93.1	41	82.0	18	50.0	8	47.1	23	29.5	27	39.7
13+	22	95.7	10	83.3	7	70.0	2	40.0	6	31.6	4	25.0
Family Income (pesos)												
Lo - 6000	129	97.0	57	79.2	30	71.4	12	60.0	35	30.2	48	48.0
6001 - 9800	127	96.9	58	77.3	30	60.0	8	40.0	41	35.3	45	44.6
9801 - 14900	160	98.2	65	69.9	29	48.3	9	28.1	50	34.5	75	55.6
14901 - 29000	145	96.0	72	80.0	29	52.7	6	25.0	40	31.5	50	44.2
29001 - Hi	71	97.3	27	65.9	14	48.3	4	25.0	25	37.9	31	52.5

Table 6-1(b) Initiation and Duration of Breastfeeding, and Introduction of Bottlefeeding According to Socio-economic Factors

	EVER BREASTFED (N)	%	BREASTFED 3 MONTHS (N)	%	BREASTFED 6 MONTHS (N)	%	BREASTFED 9 MONTHS (N)	%	BOTTLE BY 1 MONTH (N)	%	BOTTLE BY 2 MONTHS (N)	%
Mother's Age												
12-17 years	27	96.4	10	62.5	5	71.4	1	50.0	7	25.9	12	52.2
18-19	69	93.2	30	71.4	17	58.6	5	55.6	26	40.6	32	53.3
20-24	246	97.2	119	77.3	54	56.8	19	37.3	59	26.7	87	43.7
25-29	167	96.5	69	72.6	30	46.9	10	28.6	46	31.3	58	43.6
30-34	109	98.2	47	71.1	22	52.4	6	37.5	37	37.4	47	54.7
35-39	43	100.0	18	81.8	7	70.0	1	20.0	21	53.8	20	62.5
40-	19	94.7	10	90.9	8	88.9	2	50.0	8	47.1	9	60.0
Parity												
1	251	95.4	103	74.6	43	53.8	11	32.4	84	36.8	111	55.0
2-3	313	97.5	144	73.8	72	56.7	24	36.9	88	31.2	113	44.5
4-5	87	97.8	42	75.0	20	56.6	6	33.3	22	28.6	31	44.9
6-12+	20	95.2	11	91.6	5	62.5	1	50.0	7	36.8	7	41.2
Mother's Birthplace												
Elsewhere (migrant)	430	97.9	189	75.3	91	55.5	27	34.2	135	34.9	176	51.5
Bogota	236	95.5	107	72.8	46	54.1	14	35.9	66	30.6	84	42.9

Table 6-2 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Background Socioeconomic Variables.

Model	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Intercept	3.5767 [1](6.63)**	1.0406 (2.41)	0.8331 (1.24)	1.0543 (0.69)	-1.3596 (7.32)**	0.0033 (0.0)
Mother's Education	0.13998 (0.29)	0.1904 (2.02)	-0.0628 (0.17)	0.3486 (1.97)	-0.2062 (4.29)**	-0.2865 (8.10)**
Mother's Age	0.01532 (0.08)	-0.0022 (0.01)	0.0077 (0.06)	-0.0444 (0.78)	0.06604 (12.65)***	0.0532 (7.63)**
Family Income	-0.2294 (1.07)	-0.1533 (1.98)	-0.2061 (2.63)	-0.5807 (7.76)**	0.6177 (0.57)	0.0709 (0.74)
Mother's Birthplace	-0.9193 (3.04)	-0.2937 (1.21)	-0.-100 (0.00)	-0.1924 (0.16)	0.0020 (0.00)	-0.2128 (1.14)
Parity	0.2205 (0.28)	0.1333 (0.41)	-0.0418 (0.03)	0.1766 (0.19)	-0.4605 (10.15)**	-0.5273 (12.88)***
Model X^2 r	5.40 0.0	3.66 0.0	4.98 0.0	9.85 0.0	19.45** 0.116	22.74 0.137

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 6-3 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models with Background Variables as Predictors.

	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Mother's Education					
5-7* vs 1-4 years	NS	NS	NS	0.814 (0.669,0.989)	0.751 (0.616,0.915)
13+ vs 5-7*	NS	NS	NS	0.940 (0.773,1.143)	0.423 (0.345,0.586)
Age					
20-24* vs 18-19	NS	NS	NS	1.068 (1.030,1.108)	1.055 (1.016,1.095)
30-34 vs 20-24*	NS	NS	NS	1.141 (1.100,1.183)	1.112 (1.071,1.155)
40+ vs 20-24*	NS	NS	NS	1.302 (1.256,1.351)	1.237 (1.191,1.285)
Income					
9801*-14900 vs Lo-6000	NS	NS	0.313 (0.208,0.471)	NS	NS
29000-Hi vs 9801-14900*	NS	NS	0.313 (0.208,0.471)	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS
Parity					
2-3* vs 1	NS	NS	NS	0.631 (0.475,0.838)	0.590 (0.442,0.787)
6+ vs 2-3*	NS	NS	NS	0.398 (0.300,0.528)	0.348 (0.261,0.464)

*Modal Category

Table 6-4 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Background Socioeconomic Variables & Bottle by 1 Month Predictors

Model	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Intercept	1.1229 (2.57)[1]	0.7379 (0.93)	1.435 (1.20)
Mother's Education	0.1200 (0.74)	-0.0552 (0.13)	0.3771 (2.22)
Mother's Age	0.0314 (1.26)	0.0273 (0.71)	-0.0579 (1.24)
Family Income	-0.1727 (2.31)	-0.2360 (3.25)	-0.6138 (8.22)***
Mother's Birthplace	-0.3528 (1.63)	-0.0847 (0.08)	-0.2850 (0.34)
Parity	-0.0510 (0.05)	-0.11561 (0.21)	0.1641 (0.16)
Bottle by 1 Month	-1.2468 (20.34)***	-0.7525 (5.28)**	0.4490 (0.75)
Model X^2 r	25.27*** 0.177	11.06 0.0	11.16 0.00

*Significant .05 level; ** <.01 level; *** <.001 level.

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 6-5 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models with Background Variables and Bottle By One Month used as Predictors.

	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Mother's Education	NS	NS	NS
Mother's Age	NS	NS	NS
Family Income			
9801-14900* vs Lo-6000	NS	NS	0.293 (0.192,0.446)
2900-Hi vs 9801-14900*	NS	NS	0.293 (0.192,0.446)
Mother's Birthplace	NS	NS	NS
Parity	NS	NS	NS
Bottle by 1 Month	0.287 (0.167,0.494)	0.895 (0.248,0.895)	NS

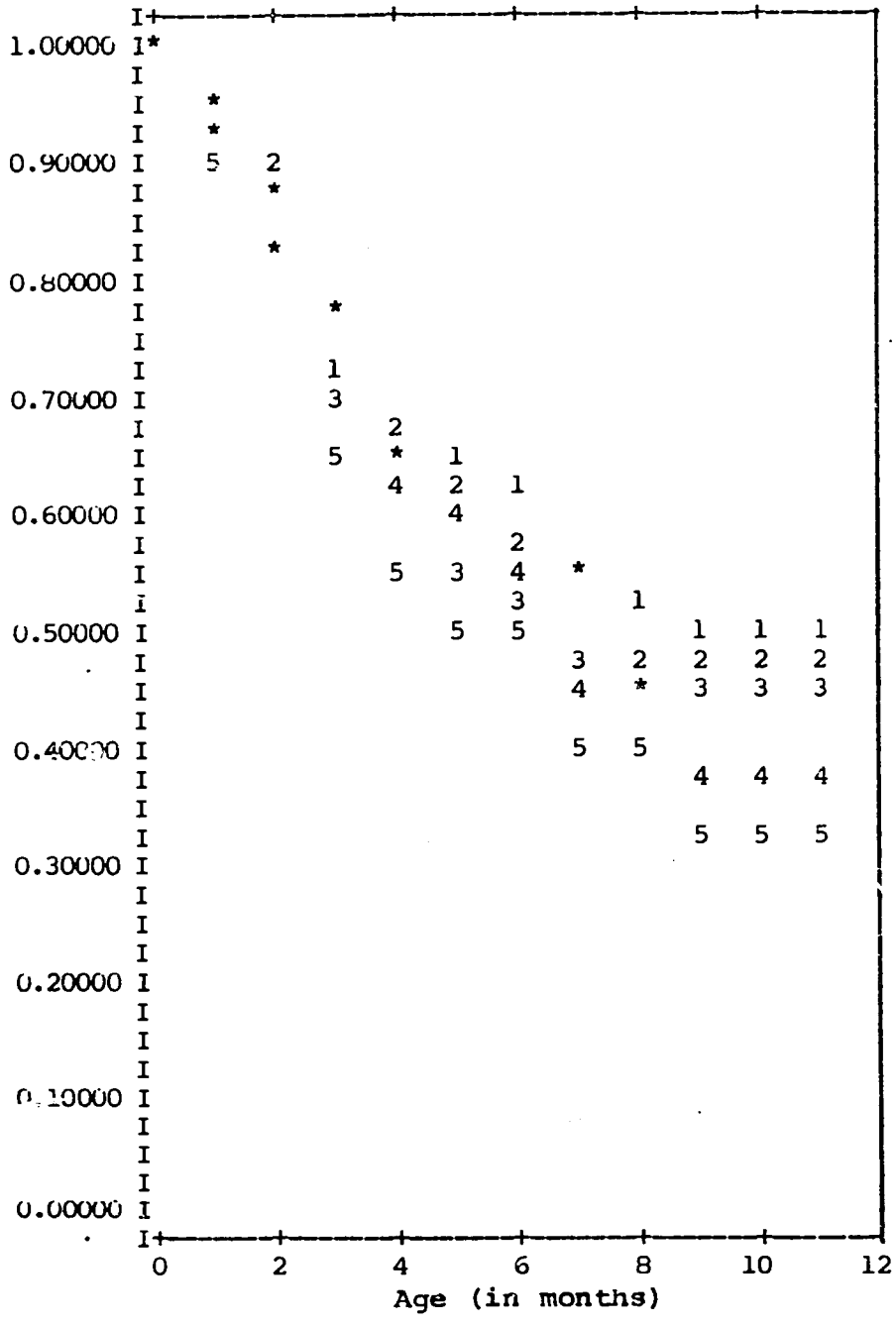
*Modal Category

Table 6-6 Logistic Regression Model for Breastfeeding to 6 months (excluding children not Breastfed to 3months) using Background and Bottle By 1 month as Predictor Variables.

	Beta	Chi^2
Intercept	1.9964	3.58
Education of Mother	-0.3010	2.16
Age of Mother	0.0379	0.70
Income	-0.1211	0.44
Mother's Birthplace	0.0799	0.04
Parity	-.4209	1.45
Bottle By 1 Month	0.1520	0.09
Model Chi^2		6.00 (0.0)

Figure 6-1

Duration of Breastfeeding by Family Income



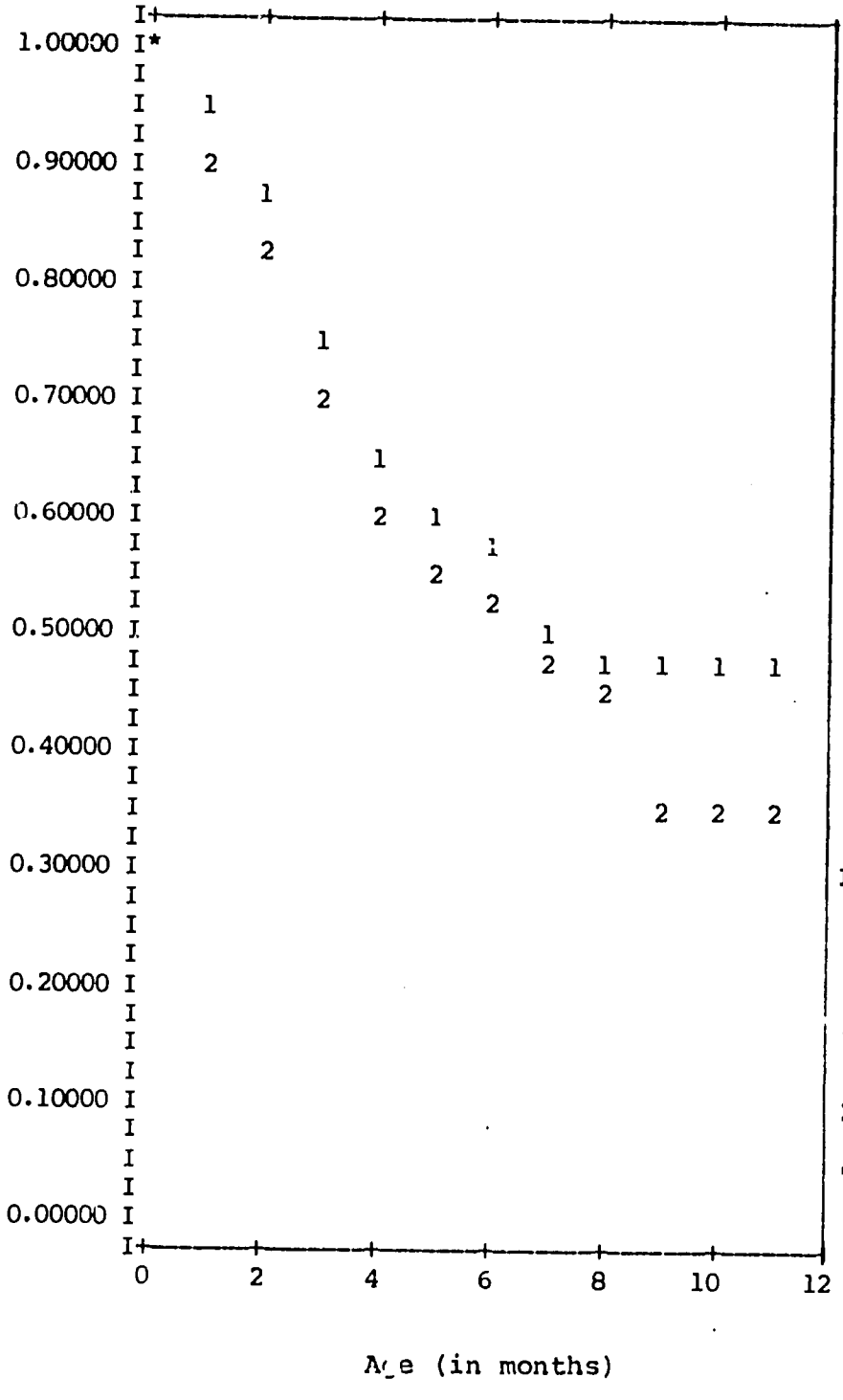
Key:

		N	Median Survival
1	low-6000 pesos	119	8.68
2	6001-9800	117	7.70
3	9801-14900	145	6.56
4	14901-29000	141	6.45
5	29001-60000	63	6.09

* = more than one group

Figure 6-2

Duration of Breastfeeding by Mother's Birthplace



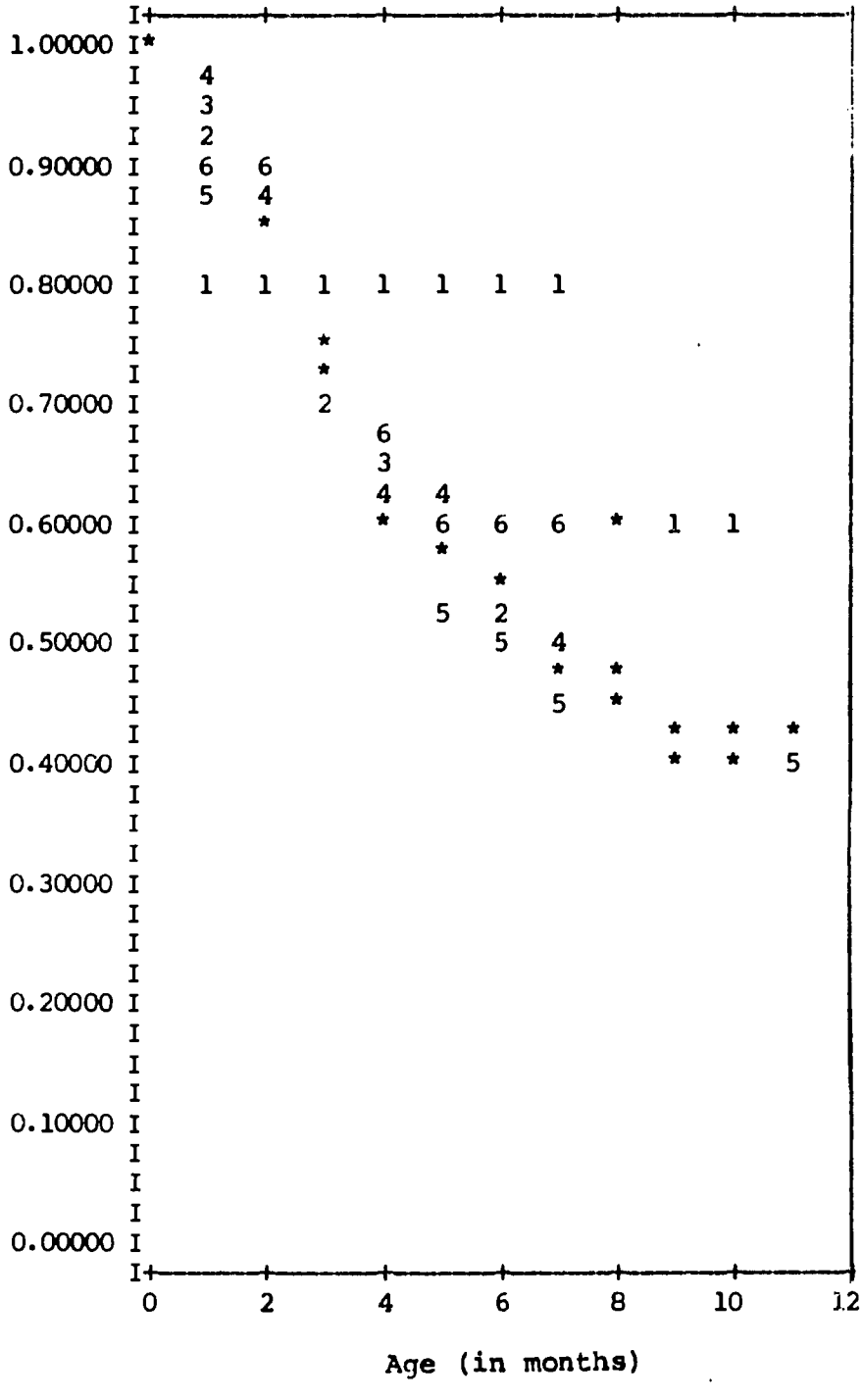
Key:

	N	Median Survival
1 Born Outside of Bogota	390	7.31
2 Bogota-born	229	6.42

* = more than one group

Figure 6-3

Duration of Breastfeeding by Mother's Education



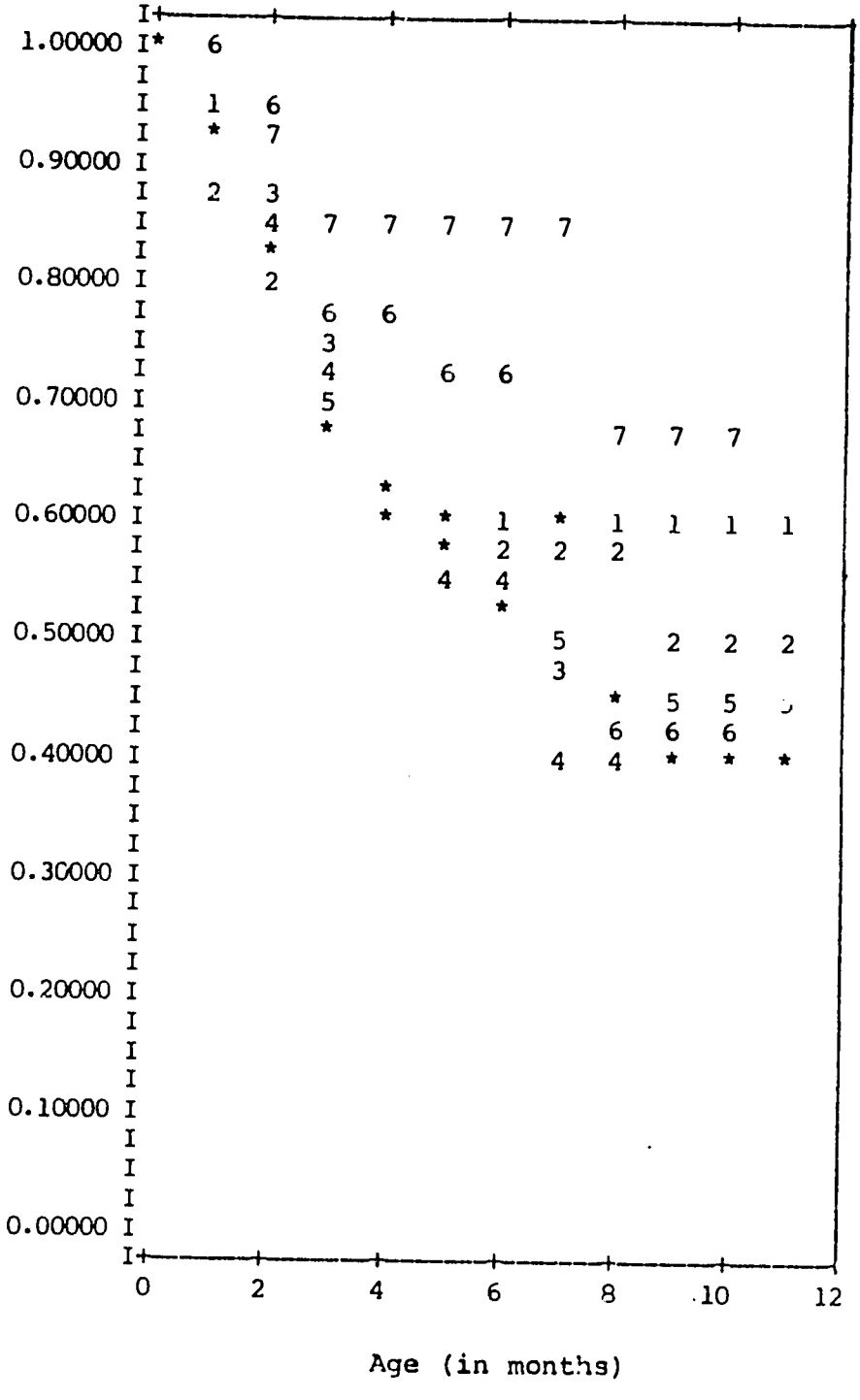
Key:

	N	Median Survival
1 = None	15	10.0
2 = 1-4	130	6.56
3 = 5-7	241	6.81
4 = 8-10	145	6.89
5 = 11-12	80	6.08
6 = 13+	20	8.45

* = more than one group

Figure 6-4

Duration of Breastfeeding by Mother's Age



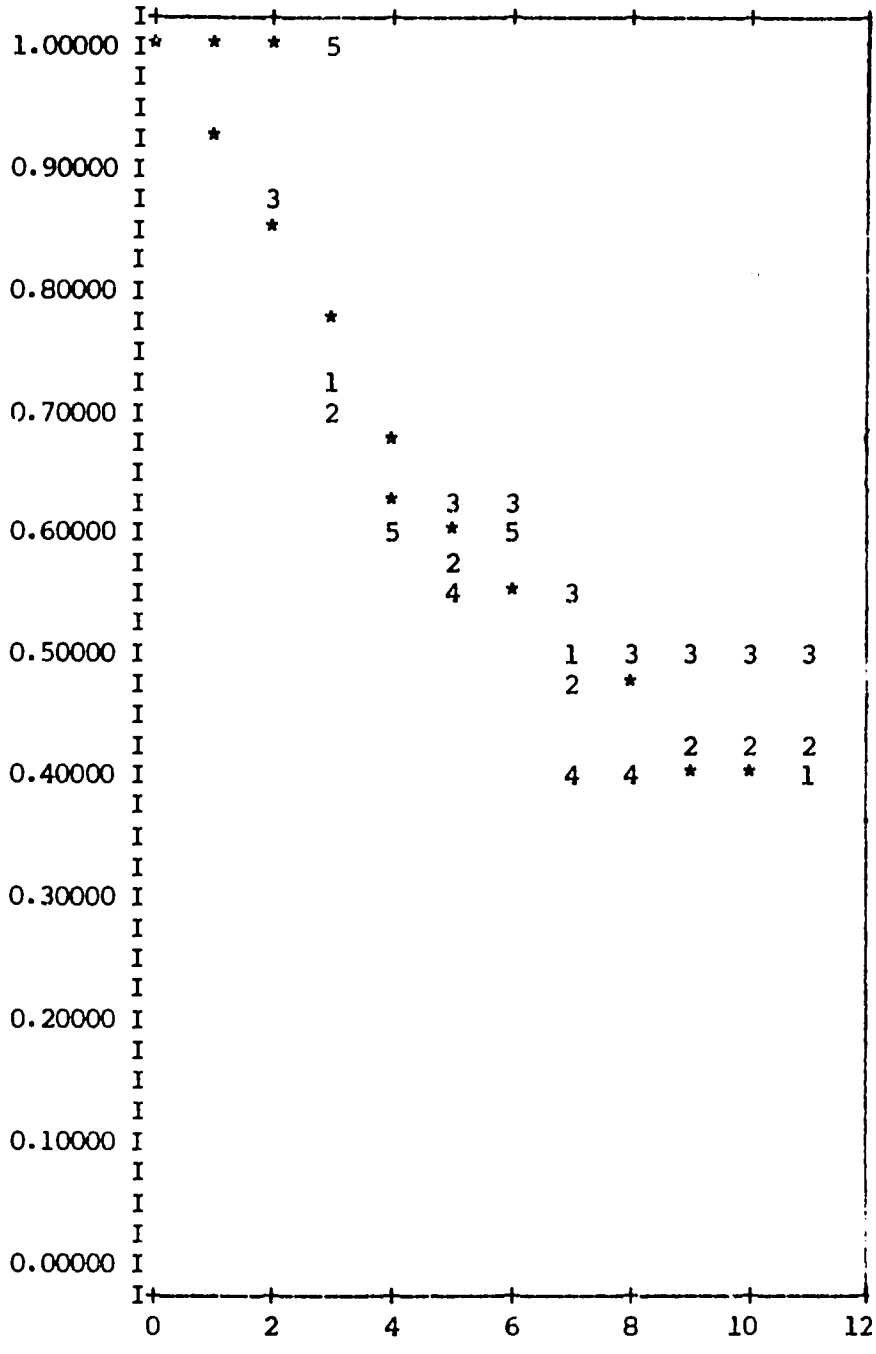
Key:

	N	Median Survival
1 = 12-17	27	11.0
2 = 18-19	65	8.97
3 = 20-24	228	6.57
4 = 25-29	156	6.28
5 = 30-34	102	6.72
6 = 35-39	40	7.64
7 = 40 years or more	15	10.0

* = more than one group

Figure 6-5

Duration of Breastfeeding by Parity



Age (in months)

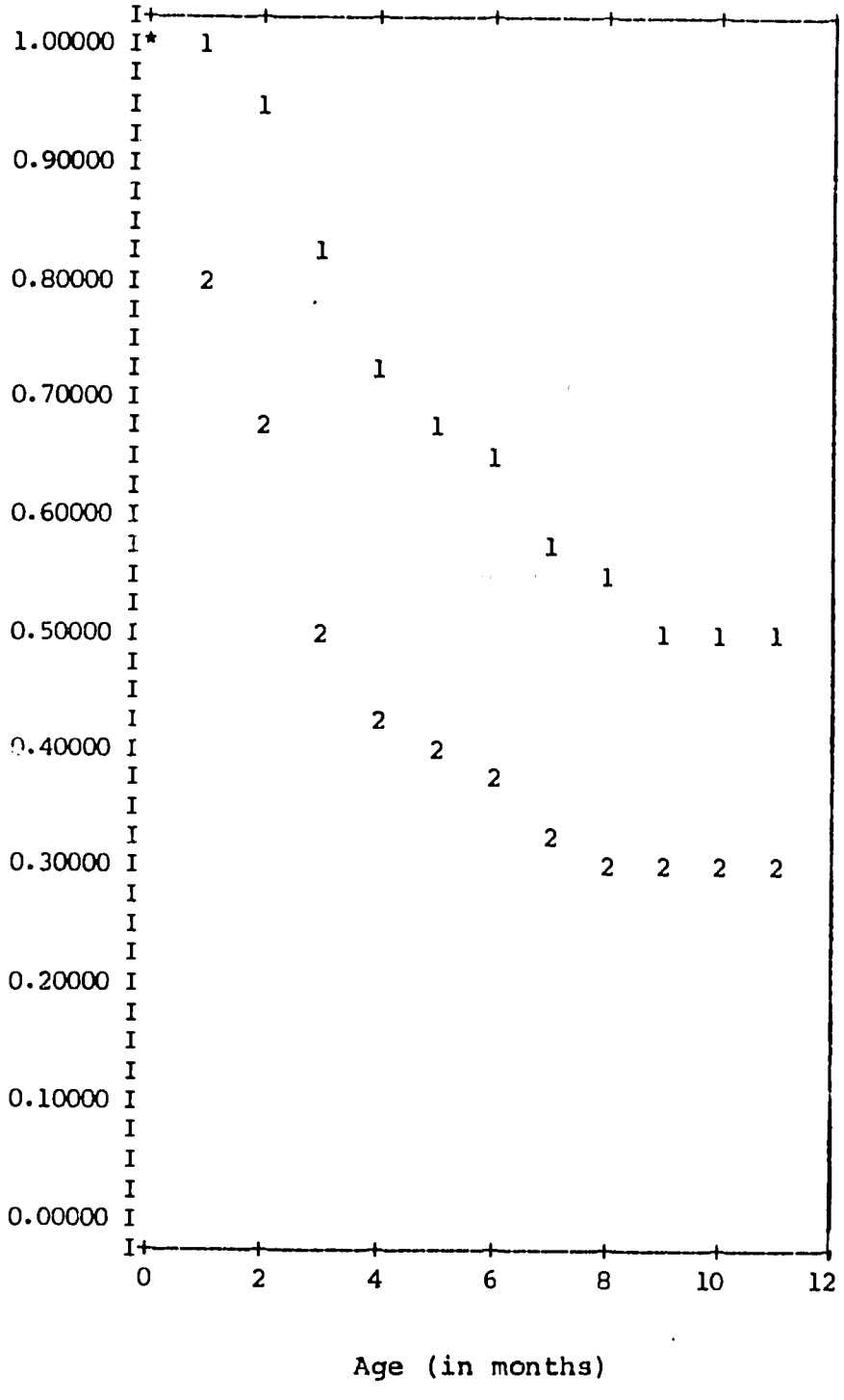
Key:

	N	Median Survival
1 = 1	234	7.13
2 = 2-3	288	6.65
3 = 4-5	83	7.84
4 = 6-7	16	6.32
5 = 8-9	4	6.00
6 = 10-12+	1	2.50

* = more than one group

Figure 6-6

Duration of Breastfeeding by Introduction of a Bottle by 1 Month



Key:

		N	Median Survival
1	No	374	8.89
2	Yes	174	3.01

* = more than one group

CHAPTER VII DETERMINANTS OF INFANT FEEDING PRACTICES: INFANT FOODS MARKETING

Methodology

The general objective of the marketing studies was to examine the role of infant food marketing and distribution strategies on infant feeding behavior. Because commercial marketing strategies and practices are developed, or refined, on a country-by-country basis, and because no prior marketing research studies of infant food marketing had been undertaken in the participating countries, much of the marketing research was descriptive and exploratory in nature. Five research questions guided the researchers:

1. What current practices and strategies characterize the infant food marketing in each nation?
2. What factors account, in whole or in part, for the current marketing environment?
3. What is the intensity of current promotional activity by infant food sellers to mothers, health care workers, and others who influence infant feeding choices?
4. What effects, if any, do the marketing practices and policies of infant food sellers have on infant feeding behavior of mothers?
5. What effects, if any, do the marketing practices and strategies of the infant food sellers have on the behavior of health care providers?

Three specific approaches were used to answer these questions: a retail market study; a study of the state of the industry; and a consumer behavior study.

The retail market substudy explored the distribution of breast milk substitutes by examining the number, variety, and prices of products in a sample of sales outlets (food stores, shops, pharmacies). Preliminary market investigations and ethnographic field research on the commercial products actually used to feed infants were employed to develop a list of products in current use in each country.

The state of the industry substudy provided information about the production, distribution, and advertising policies and practices of infant food wholesalers and retailers. Trade policies and regulations of national governments were analyzed to determine their influence on the production, distribution, and advertising practices of producers and sellers. Information was collected through secondary data analysis and interviews with appropriate industry, government, and health personnel. Specific

practices such as the distribution of free samples and promotion to the medical profession were also examined as part of other subsidies.

The consumer behavior substudy, administered as a segment of the cross-sectional survey in infant feeding practices, provided data on the demand for breast milk substitutes. The decisions to buy and use breastmilk substitutes are manifested in two distinct types of behavior, namely, purchase of a commercial breastmilk substitute and the actual feeding of such a product to the baby. Purchasing behavior was elicited through survey questions on commercial products fed to infants as well as through observation of retail practices. Feeding behavior was explored in the cross-sectional survey.

Research questions 1, 2, and 3 were studied through the retail audit and state of the industry analysis in each country. This research provided a baseline of information about commercial infant foods marketing which is currently unavailable in each site. The retail audit analysis consisted of collection and analysis of price, product, and promotional data from retail shops and outlets in each field site. These data were collected by local subcontractors on site. All subcontractors were trained or certified as to professional qualifications by Trost Associates Incorporated of Norwalk, Connecticut, the Consortium's marketing subcontractor. Retail audit reports were tabulated and analyzed by Trost Associates prior to submission to the Consortium. The state of the industry analysis consisted of secondary research about the development and size of the infant foods industry; direct observations of industry activity by Consortium staff, consultants, or subcontractors; and interviews of infant food company executives and employees, other businessmen directly involved with the industry, and health providers possessing first-hand information about industry actions.

Research question 4 addresses the "consumer behavior" of mothers. To examine maternal decision making, questions of such topics as product awareness, brand awareness, past feeding behavior, and hospital practices (e.g., receipt of samples) were included in the cross-sectional survey instrument.

Research question 5 was addressed through interviews with health care personnel, infant food company representatives, and through direct observation by Consortium staff, consultants, or subcontractors.

In Bogota, the retail market and state of the industry substudies were carried out by Dr. Adela Morales De Look, an anthropologist and member of the Javeriana University research team. Dr. Morales received specialized market research training in the United States from Trost Associates, Inc., to complement

her research skills. The state of the industry interviews and data collection were conducted by Dr. Morales in Bogota, according to a protocol developed by Trost Associates. Reports were forwarded to Trost Associates on all facets of the state of the industry and retail audit sub-studies.

The retail audits of Bogota establishments were conducted in two phases, an approach that was unique among the four sites studied in this project. The absence of reliable retail census data for Bogota required an initial pilot study. This phase of the research developed a typology of retail outlets that carry infant foods. Preliminary ethnographic information indicated that some foods fed to infants are not promoted by manufacturers for that use, but may be promoted at the retail level as appropriate infant foods. For this reason, it was also necessary to insure that the retail audit include outlets which carried the many types of foods expected to be mentioned by mothers in the cross-sectional survey.

At the end of Phase I, a sampling frame was constructed by the Javeriana research team (and approved by Trost Associates). It included six types of retail outlets that carried at least some of the basic foods. Data were collected in each of six socioeconomic strata of the city, as defined by DANE, the Columbia Bureau of Census. In Phase II of the study, a random sample of 173 stores was selected for study (Table 7-1). Approximately 70 percent of the outlets surveyed were in Strata I through III, and the remaining 30 percent were in Strata IV through VI. The proportion of shops falling into these two clusters corresponds roughly to the relative proportions of households in Bogota when grouped by socioeconomic strata.

The collection of data was conducted and supervised by Dr. Morales and forwarded to Trost Associates for tabulation and analysis. Trost Associates, Inc., prepared the detailed audit report for the consortium which integrated survey data, and the retailer interview data, collected in Phase I.

Four categories of data were collected for the state of the industry substudy: general information (name of companies, past history, local versus multinational firms); competitive environment (market share, pricing patterns, promotional activities, medical relationships); channels of retail distribution and health care system contact; and government regulatory activities. Data were collected from multiple primary and secondary research sources for each category.

Data for the consumer behavior substudy were drawn from the cross-sectional survey of mothers in Bogota. Questions were developed in such areas as products used, awareness of past and present advertising, product and brand awareness, and advice received from various sources, including health care providers,

friends, and relatives. The consumer behavior analysis has utilized these data, and data from other sections of the survey, to assess the influence of marketing on maternal decisions to use breastmilk substitutes and to purchase particular products.

Retail Availability

Commercial infant foods are widely available in Bogota and found in all types of retail outlets serving most socioeconomic strata of the population. In the retail audit study, an effort was made to collect data on the availability of infant formulas, liquid and powdered milks, cereals, grains and starches, soups, pureed jar food, and PAN products. PAN is the government sponsored Plan for Applied Nutrition; its products are sold for infant feeding and widely used for that purpose. In addition, the ethnographic research identified a number of products used for infant feeding in Bogota that are not intended by manufacturers for that purpose, including powdered milk, liquid milks, flours and starches, and panela.

Table 7-2 shows the availability of commercial infant foods by type of outlet and socioeconomic stratum. The number of cells in this table is so large that the actual number of shops carrying different brands is shown, rather than percentages. Infant formula products were found in 75 percent of the outlets sampled. In terms of outlet type, formulas were less available in tiendas-PAN and general tiendas (38% and 58%, respectively). They were somewhat more available in neighborhood drugstores (79%) and had their greatest availability in chain drugstores, chain supermarkets, and subsidized supermarkets (>90%).

Nestle, the largest producer of infant formula in Columbia, sells six brands of infant milks in Bogota. These products were found in 68 percent of outlets sampled, ranging across the five highest socioeconomic strata (II-VI), and in each of the different types of retail outlets audited. Wyeth Laboratories, which sells two brands of infant milks in Bogota, also has broad distribution of its products. Sixty-one percent of the outlets surveyed carried one or more of the Wyeth formulas. These outlets were found in socioeconomic strata II-V, and, like the Nestle products, were available in stores of all types. Abbott Laboratories, which imports only one brand of formula (a so-called "therapeutic formula"), had only a 25% penetration among the outlets studied, with no representation in either the tiendas-PAN or general tiendas categories. The outlets which carry Abbott formula are located only in Strata III, IV, and V.

Cereals marketed for infant feeding are available in 59 percent of the audited stores. The percentage of outlets

carrying such cereals increase with the increasing socioeconomic level of the stratum. In stratum II, for example, only 50 percent of the outlets carry cereals, while in V, 75 percent of the outlets surveyed carried these products.

Flours and starches are in relatively high supply in stores and supermarkets in Bogota. Although products are used for purposes other than infant feeding, it was determined that such products are used by consumers as infant foods and are offered for sale by retailers as baby foods. Purees and soups are also sometimes used for feeding babies. Purees are generally sold at supermarkets (42 percent of all outlets studied) while commercially prepared soups had lower overall availability in Bogota (only 13 percent of outlets). Four types of PAN products were classified as infant foods and were found at 95 percent of the audited outlets eligible to carry such products.

Among the most widely available products were powdered milks and liquid milks. Powdered milks, suitable for adults and children, were available in 74 percent of the outlets audited, with sales especially high in supermarkets, grocery stores, and neighborhood drugstores. Fifteen different brands were identified in Bogota, some of which were skim or semi-skim milk. Liquid milk is sold primarily at grocery stores in Bogota, although day-to-day availability fluctuates because of delivery and transportation. Liquid milks are labelled by their distributors or sellers; fifteen brands were identified in the retail study.

Table 7-3 shows the relative volume of each manufacturer's product within outlets in different socioeconomic strata. In every category, Nestle products represent the largest proportion of total volume of formula in the stores. In all outlets, infant foods are displayed prominently. In supermarkets and self-service stores, the products are usually near disposable diapers, nipples, and bottles. In tiendas, consumer visibility determines location.

Price

An analysis of price variations among comparable products in the retail study disclosed significant variations across socio-economic strata and type of retail outlet. Bogota appears to have little uniformity in the pricing of products, a situation that results from the interplay between distribution costs (and hence costs to sellers), neighborhood retail competition, and consumer elasticity (the price the consumer can bear). An analysis of nine infant milk products (Nestogeno-1, Nestogeno-2, Pelargon, Lactogeno, Nan, AL-110, SMA, S-26 and Isomil) showed that the lowest consumer prices for 5 of the 9 products were found in the subsidized supermarkets and the highest prices in the neighborhood drugstores in Strata II, III, and IV.

With the exception of Nestogeno-1 and Isomil, individual products had prices which varied by between 21 and 51 pesos. Isomil had a range of 83 pesos, and Nestogeno-1 had a range of 120 pesos. Indeed, there was little similarity in the price of brands regardless of the type of outlet, or the socioeconomic strata where it is sold. Likewise, similar products showed price diversity regardless of socioeconomic strata or outlet type. A similar finding of pricing diversity was evident in an examination of cereal prices. Again, there were significant variances in prices across type of outlet and socioeconomic strata. These data strongly support a conclusion of intense retail-level competition.

PAN products provide an important exception to the analysis of pricing variations. PAN products were found to have no significant variations at Strata II and III where the survey sites were located. Importantly, however, although PAN was created to meet the needs of poorest sector of the population, it was not possible to locate any PAN participating site in Strata I (the poorest strata). It is unclear whether this absence occurred because participants in the program did not actually live in Strata I or whether they shopped closer to the place where they obtained the PAN coupons (presumably in Strata II). These questions are intriguing for several reasons, including the fact that one of the surveyed sites was ready to discontinue the program and, in order to sell off the remaining inventory, was selling one product (PAN oatmeal) without requiring coupons. Also, we noted that another PAN product, Duryea cornstarch, was off the market by the time the survey was conducted in November, 1981. We are not able to determine whether the marketing of the PAN program is an important influence on infant feeding practices in Bogota. According to retailers, Colombian consumers are very brand-conscious. Thus, brand loyalty is cultivated wherever possible by producers. Brand consciousness has led both Nestle (Cicolac) and Wyeth to promote their brands through health workers and health facilities. Additionally, in the perception

of retailers, early acquaintance with these brands, if favorable, is believed to create a loyal consumer.

It was noted that in Strata I-IV, consumers do tend to make purchases relatively more frequently in tiendas despite a slightly higher price for products. Results from the ethnography suggest that this behavior stems from the willingness of tienda operators to extend credit to local customers, a benefit they can not obtain in the larger stores and supermarkets.

Competitive Structure

Bogota is a concentrated market, with Nestle and Wyeth sharing nearly all infant formula sales. Abbott accounts for a very small share of sales with its soy-based formula, Isomil.

Price competition is limited among the large manufacturers, with neither Nestle nor Wyeth anxious to begin a price war. Competition is more likely to occur through expanded retail availability and product promotion. Interviewees indicated that mass advertising was once a popular means of competing, but since the government's ban (Decree 1220; 1980) none has been seen. Instead, promotion is now focused on hospitals and health professionals. Both major infant formula companies supply educational materials, gifts, product samples, and free supplies to health workers and institutions.

Products not covered by the W.H.O. Code (i.e., food other than breastmilk substitutes) continue to be advertised in Bogota. Numerous advertisements for powdered milks, cereals, flours and other products were observed. At the time of this study, the Colombian economy was in a recessionary period, and retailers indicated that a consumer shift was underway from the high priced humanized formulas toward lower priced milk products. However, no time series data was available to confirm these reports.

For many of the products used to feed infants, there exists competition between multinational firms and local producers. This is especially true in flour/starch group of products. According to industry, retailer, and government officials, quality control is a serious problem with locally produced products. The multinational companies are widely believed to excel in this area of product performance, and consumers who are able to afford products produced by the multinational firms will be inclined to purchase them rather than local products.

In the broad commercial foods industry, public and government concern for product quality have led to regulatory actions. However, there continues to be abuses, including an influx of contraband milk. Data are limited, but the Javeriana

research team was certain that the illegal entry of liquid milk from Venezuela into the Bogota market, coupled with the domestic price control system (keeping local prices stable) and the economic recession, all combined to produce an increased use of contraband milk to feed infants as well as adults.

Various channels of distribution are used by manufacturers in Bogota. The variety of store types, and Bogota's complex geography require manufacturers to employ multiple channels to distribute products efficiently. Direct distribution is of two types:

```
                 Supermarket Distribution          Retail
          |-----> Central Supply          -------> Branch
          |
          |
Producer  |
(Nestle)--
(Wyeth)   |
          |      Drugstore Distribution          Retail
          |-----> Central Supply         --------> Branch

Producer
(Wyeth)  --------------> Retailer (Neighborhood Drug Stores)
```

Intermediaries are also used:

```
Producer ------------> Wholesaler ---------> Retailer (Store)
(Nestle)
(Wyeth)

Producer -------> Wholesaler/ --------> Retailer -----> Branches
(Nestle)          Distributors          (Central Store)
```

Government Regulation

The National government has actively attempted to influence the behavior of the infant foods industry. Mass media advertising has been banned since before the W.H.O. Code, and none was noted in this study. Product quality, and quality control procedures, has been an important area of regulatory concern. Decree 1220 (1980) also addresses Labelling requirements. Some product labels were found which apparently violated these requirements. It is important to recognize that

the Ministry of Health has more recently acted to implement labelling provisions of the W.H.O. Code.

The existence of contraband milk in Bogota exacerbates issues of quality, Labelling, and consumer safety. At the time of this study, government initiatives were underway to curb contraband milk sales.

Medical Promotion

Interviews, direct observations by Consortium staff, and survey data confirm the efforts of infant food companies to communicate directly with health workers and indirectly with mothers. Nestle (Cicolac), Wyeth, and Abbott provide educational materials, posters, product samples, and free supplies to health facilities. According to health workers and industry personnel, gifts have occasionally been given to health workers, and hospitals (e.g., pediatric equipment).

Commercial Influences and Consumer Behavior

A marketing analysis of infant feeding patterns should focus on factors that affect the supply and demand for commercial infant foods, here specifically formula and non-formula milks. Factors that affect the supply have already been discussed, i.e. the availability of formula and non-formula milks in retail outlets, the number and diversity of products, and the relationship between producers and the State. Factors relevant to the demand for commercial infant foods include those experiences and circumstances that have direct bearing on the mother and her child, i.e., the receipt of a promotional sample of infant formula, problems with breastfeeding, or labor force participation. Less direct influences are those that result from previous experience, or encounters, such as recommendations about infant feeding from relatives, neighbors, or health workers.

Information about consumer behavior and influences in Bogota is available from two sources. The research team in Bogota included questions in the cross-sectional survey on the receipt of free samples, brand endorsement from physicians, and the recollection of mass market advertising. Information on more subjective dimensions of the use of commercial infant foods, such as knowledge and attitudes are available from the ethnographic studies. Data from the cross-sectional survey will be addressed first, specifically, the receipt of free samples of infant formula, recall of advertising, and report of physician endorsement of specific formula brands. Discussions of those

findings will be augmented with information from the ethnography, and additional information relative to consumer behavior will be taken from the ethnography.

Samples

Only 6.2 percent of the women interviewed in Bogota reported receiving a free sample of infant formula (Table 4). There appears to be no pattern of distribution by income, years of schooling, age, or parity. As seen in Table 7-4, however, women who are working at the time of the interview were more likely to report receiving a sample than women who were not currently working. The absence of rooming-in was significantly associated with receiving a sample ($p<.01$) and, in particular, delivery in one of the Social Security hospitals was significantly associated with receiving a sample ($p<.01$). These associations may all be explained by the facts that (1) working women may be more likely to be covered by the Social Security medical system and (2) the Social Security Hospitals do not generally offer rooming-in arrangements for mothers and babies.

Overall, the distribution of free samples does not appear to be widespread. According to interviews with health care professionals, free samples are routinely given to physicians in 200 gram tins with the label "Medical Sample--Not For Resale." According to those interviewed, companies only provide samples on request from the hospital, or individual physician samples of formula are kept with the other samples of products that have been provided. It was interesting to note in the report on industry-medical relations that both drug samples and infant formula samples are sometimes given to the "volunteer ladies" for distribution on a charitable basis to those with no access to health services. This practice may account for the finding that some women who had their baby at home reported receiving free samples.

Even though the number of women who reported receiving a free sample was small, we sought to determine whether or not receiving a free sample of infant formula had an effect on infant feeding patterns. Regression analysis did not show any independent effect of receiving a free sample with the duration of breastfeeding or the early introduction of bottlefeeding.

Recall of Advertising

Approximately one-half of the Bogota sample recalled mass market advertising of commercial infant foods (Table 7-5). Women with higher educational attainment are more likely to report recollection of advertising ($p<.001$). Likewise women with higher family income were more likely to remember this type of promotion ($p<.001$). There is no noteworthy difference between primiparous and multiparous women in this regard; comparisons by age do not reveal any overall trend.

Endorsement of Formula by a Physician

One in four women reported that they used a particular brand of formula on the recommendation of a physician (Table 7-6). The higher a woman's family income and education the more likely she was to receive this kind of endorsement; delivery in a private hospital was also strongly associated with brand endorsement by physician. In addition, women who received a free sample of infant formula was more likely to report this kind of endorsement than those who did not receive a free sample.

The ethnography provides some corroborating evidence for these findings, and suggest several interpretations. Physicians who work in the public h[illegible]tals and Social Security hospitals have fewer opportuni[illegible] interact with patients than physicians who work in [illegible]e hospitals. The average length of time a mother spends [illegible] public hospital or Social Security hospital is shorter than [illegible]e private hospitals, and the case load for physicians in t[illegible] public and Social Security hospitals is much greater. Thus, one can not conclude with any certainty that health workers in public hospitals and Social Security hospitals are any less likely to endorse specific brands, only that mothers who deliver in those two settings are less likely to <u>receive</u> such an endorsement.

The ethnography also reported that the practice of writing prescriptions for formula, and leaving these instructions with the head nurse was common in the private hospitals. This practice of prescription writing in the private hospitals is in anticipation that the mother may request formula for her baby. If the nurses have a prepared prescription, it will not be necessary to contact the physician for approval. In this instance, the physician specifies a particular brand. Health workers that were interviewed indicated that they do recommend particular brands and that mother's are highly likely to continue feeding the formula that was endorsed.

Summary

There is broad availability of commercial infant foods in Bogota. The available infant formulas and cereals are produced by multinational companies, while flours, starches, and other foods being fed to infants are produced locally. Distribution networks for all these foods are highly developed and extensive so that, with the exception of drugstores, the full spectrum of products is usually present in most outlets selling any infant foods. The retail audit revealed that some of these locally produced products were of low quality and showed evidence of mislabelling. Labelling problems included labels in English, misstatements of nutritional value, and misrepresentation of the products suitable as an infant food.

The price competition between infant formulas and cereals is limited, probably because the market is dominated by two companies, Nestle and Wyeth. Price competition among other products (non-formula milks, grains, starches, etc.) was more evident, a situation which exacerbates problems of quality and mislabelling. In an economic climate of greater competition, there is little incentive to improve quality and hence increase production costs.

The promotion of commercial infant foods through mass market advertising has virtually disappeared in Bogota, and has led producers to promote their products through regular contact with the health sector. The ethnography points to regular visits to hospitals by company representatives, and both the ethnography and cross-sectional survey of mothers confirm that brand endorsement by health workers is routine. Health workers also indicated that the outcome of this endorsement would be brand loyalty, and evidence from the cross-sectional survey supports this conclusion. A more subtle kind of promotion, but important under advertising restrictions, is simply brand visibility. The wide availability of many different infant foods is consistent with this marketing practice. Finally, the distribution of free samples to mothers does not appear to be widespread.

A distinctive feature in Bogota is the extent to which mothers use many different foods, and combinations of foods, to feed their babies. These patterns are both the result of cultural beliefs and economic conditions that constrain the ability to purchase higher quality infant foods. These conditions mean that brand endorsement by physicians must be considered in the light of two possible explanations -- the physicians are expressing their own loyalty to a particular company, and/or they want to be sure the first breastmilk substitute is appropriate for infant feeding.

From a policy standpoint the fact that the infant formula market is dominated by two companies means that the government could go further to limit promotion via the health sector. In

addition, solving problems of poor quality control of non-formula infant foods (including foods not intended for infants), and eliminating deceptive and inappropriate labelling would be an important step. To the extent that some health sector brand endorsement may be precautionary, education for professionals on the management of successful lactation might encourage the health professionals to concentrate their recommendations on breastfeeding.

Table 7-1 Stores Sampled in Retail Audit by Census Area

Points of Sale:	Socioeconomic Strata						Total
	I	II	III	IV	V	VI	
Tiendas--PAN	--	9	12	--	--	--	21
General Tiendas	15	12	19	5	3	1	55
Neighborhood Drugstores	--	2	23	9	--	--	34
Chain Drugstores	--	--	7	16	--	--	
Chain Supermarkets	--	1	11	11	1	--	24
Subsidized	---	---	10	6	--	---	16
TOTAL OUTLETS	15	24	82	47	4	1	173
Percent of Sample	8.7	13.9	47.4	27.2	2.3	<1.0	100%
Percent of households within each stratum*	6.48	32.83	37.27	14.10	6.96	2.35	100%

*Census of Population Data, 1972.

Table 7-2. Availability of Infant Foods by Type of Outlet

	Tiendas--PAN		General Tiendas						Neighborhood Drugstores			Chain Drug-stores		Chain Supermarkets				Subsidized Super-markets		Total
	II	III	I	II	III	IV	V	VI	II	III	IV	III	IV	II	III	IV	V	III	IV	I-VI
	(9)	(12)	(15)	(12)	(19)	(5)	(3)	(1)	(2)	(23)	(9)	(7)	(16)	(1)	(11)	(11)	(1)	(10)	(6)	(173)
	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
Formulas (Net)	6	2	--	10	14	4	3	1	1	19	7	7	16	1	11	10	1	9	6	130
Nestle	6	1	--	9	12	2	3	1	1	18	5	7	16	1	10	10	1	9	6	118
Wyeth	4	1	--	5	11	4	--	--	1	18	6	6	16	1	7	9	1	9	6	105
Abbot	--	--	--	--	--	--	--	--	--	12	3	6	12	--	2	4	1	1	2	43
Milks (Net)	7	9	--	12	18	4	3	1	--	15	4	6	16	1	11	11	1	10	6	136
Liquids	6	8	--	8	10	4	2	1	--	--	--	--	--	--	5	7	1	3	3	58
Powdered	5	4	--	12	17	4	3	1	--	15	4	6	16	1	11	11	1	10	6	128
Cereals	4	--	--	8	15	4	2	1	--	9	5	4	11	1	11	11	1	10	5	102
Grains and starches	5	9	--	10	19	4	2	1	--	--	--	--	1	1	9	11	1	9	6	88
Soups	3	--	--	--	--	--	1	--	--	--	--	--	--	--	3	7	1	4	3	22
Jarred foods	3	2	--	6	15	4	2	1	--	--	--	--	1	--	11	10	1	10	6	72
PAN products	8	12	--	2	--	--	--	--	--	--	--	--	--	--	1	--	1	1	--	25
Nothing	--	--	15	--	--	--	--	--	1	5	2	--	--	--	--	1	--	--	--	24

Table 7-3. Brand Shares of Formula Volume

	Socioeconomic Strata						
	I	II	III	IV	V	VI	Total
Tiendas - PAN							
Nestlé	—	57%	82%	—	—	—	60%
Wyeth	—	43	18	—	—	—	40
Abbott	—	0	0	—	—	—	0
General Tiendas							
Nestlé	0%	85	74	85%	100%	100%	83
Wyeth	0	15	26	15	0	0	17
Abbott	0	0	0	0	0	0	0
Neighborhood Drugstores							
Nestlé	—	100	61	32	—	—	55
Wyeth	—	0	34	64	—	—	40
Abbott	—	0	5	4	—	—	5
Chain Drugstores							
Nestlé	—	—	63	—	—	—	63
Wyeth	—	—	31	—	—	—	31
Abbott	—	—	6	—	—	—	6
Chain Supermarkets							
Nestlé	—	100	75	74	71	—	75
Wyeth	—	0	24	24	19	—	23
Abbott	—	0	1	2	10	—	2
Subsidied Supermarkets							
Nestlé	—	—	80	66	—	—	75
Wyeth	—	—	18	32	—	—	23
Abbott	—	—	2	2	—	—	2
Total							
Nestlé		81	75	68	81	100	72
Wyeth	0	19	23	29	12	—	25
Abbott	0	0	2	3	7	—	3

Table 7-4 Select Respondent Characteristics and Receipt of Sample of Infant Formula (n = 711)

TOTAL	%
Family Income*	6.2
<6001	4.5
6001 - 9800	7.6
9801 - 14900	6.1
14901 - 29000	5.3
29001 +	6.8
Education	
0 - 4	5.4
5 - 7	4.9
8 - 10	8.1
11 +	8.1
Age	
<20	4.0
20 - 24	6.3
25 - 29	7.5
30 - 34	7.3
35 +	4.8
Parity	
Primiporous	6.0
multiparous	6.3
Currently working	
NO	5.2
YES	9.7
Place of Delivery	
Home	2.7
Public Hospital	4.5
Social Security Hospital	12.3
Private Hospital	5.5
Rooming IN	
NO	12.9
YES	5.2

*54 pesos = U.S. $1.00

Table 7-5 Select Respondent Characteristics and Recall Of Advertising of Commercial Infant Foods (n = 711)

	%
TOTAL	44.7
<u>Family Income*</u>	
<6001	32.3
6001 - 9800	35.6
9801 - 14900	45.1
14901 - 29000	56.7
29001 +	58.9
<u>Education</u>	
0 - 4	24.5
5 - 7	44.1
8 - 10	52.8
11 +	63.3
<u>Age</u>	
< 19	45.5
20 - 24	48.6
25 - 29	42.7
30 - 34	42.7
35 +	35.5
<u>Parity</u>	
primiparous	49.8
multiparous	41.8

*54 pesos = U.S. $1.00

Table 7-6 Select Respondent Characteristics and Report of Physician Endorsement of Specific Brand of Infant Formula (n = 314)*

	%	
TOTAL	25.0	
Family Income**		
< 6001	15.2	
6001 - 9800	13.0	
9801 - 1490	22.7	
14901 - 29000	32.4	
29001 +	48.5	
Education		
0 - 4	13.6	
5 7	22.2	
8 - 10	31.5	
11 +	38.6	
Place of Delivery		
Home	7.7	
Public Hospital	21.3	
Social Security Hospital	24.2	
Private Hospital	43.8	(n = 46)
Rooming IN		
NO	40.8	
YES	22.3	
Receipt of Infant Formula Sample		
NO	24.0	
YES	42.1	
Currently Working		
NO	26.6	
YES	21.6	

*54 pesos = U.S. $1.00
**This question was asked only of women bottlefeeding at the time of the interview. The analysis is of those women who were bottlefeeding at the time of the interview and who responded to the question, "Why do you use this particular brand?"

CHAPTER VIII DETERMINANTS OF INFANT FEEDING PRACTICES: MATERNAL EMPLOYMENT

A major hypothesis of this study is that particular aspects of maternal employment influence women's decisions regarding infant feeding. The following section will explore this hypothesis by evaluating how maternal employment can shape decisions regarding the initiation and length of breastfeeding as well as supplementation with bottle milks.

At the time of the survey, 25% (175) of the women were engaged in some form of income-generating activity (Table 8-1). Types of occupations were listed in an earlier section of this report (Table 2-23). No women reported working at home, therefore, no distinction was made between those who work in and work out in this analysis. In contrast to the employment pattern of the sample mothers at the time of the survey, Table 8-2 shows the distribution of work status of the mothers prior to the birth of the child. Thirty-six percent of the sample worked during their pregnancy as compared with 25% who are working at the time of the survey, i.e., postpartum. Prenatal work is compared with current work status for women with children 6 months or younger and those with children over 6 months of age (Table 8-3). We see that 81% of working women with children under 6 months of age also worked during pregnancy (77% of all workers). More interesting is the group of women who stated they did not work during the prenatal period, yet are now working with infants under 6 months of age. There is no indication of how many women retained the same job after the birth of their children or whether there were changes in travel time, work hours or income. It is also unclear how many women received maternity leave or how long such leave may have been.

Tables 8-4 through 8-8 present a composite of salient characteristics of women who work. Almost fifty percent of the employed women had only one child. Seventy-three percent were under 30 years old. Thus, mothers in the labor force are younger women of relatively low parity (Tables 8-4 and 8-5). In terms of education, women with 13+ years of education were employed much more frequently than other women, but they represent only 7.4% of the sample female labor force because they are such a small fraction of the study sample. Family income (Table 8-7) demonstrates that a greater number of employed women are from households from the two middle income groups, and reveals that women from the two highest income categories are more likely than the average to be employed at the time of the survey.

The pattern of postnatal employment is more sharply seen in data presented in Figure 8-1, which gives percentages of women who work for income by age of child compared with women who work

as housewives only. As expected, very few mothers with newborns returned to work immediately after the birth of their child. Not until two months do working mothers constitute 15% of the population (which, not incidentally corresponds to the usual period allowed for maternity leave). The prevalence of work plateaus at three months at just over 20% and remains steady through the sixth month then rises to over 35% at seven months of age. Of the one-quarter of the sample employed at the time of the survey, the majority (82%) spent eight or more hours per day away from home (Table 8-8).

It is assumed that the type and location of childcare, and the degree to which the particular arrangement encourages or inhibits contact between mother and child might also influence infant feeding behavior. Table 8-9 indicates that 85% of working mothers do not take their children to work with them, suggesting that the majority of women are separated from their children for long periods of working hours each day. It is also assumed that lengthy separations can compromise extended breastfeeding and encourage too early introduction of bottles.

An interesting pattern is revealed by comparison of occupations of mothers by ages of children. The largest category of women who returned to work two months postpartum are domestic workers (32%), followed by factory workers (27%), and teachers (14%). According to Colombian labor legislation, factory workers and teachers should be entitled to paid maternity leave of eight weeks. Domestic workers are not regulated under this legislation. The largest group of children left with older siblings had mothers who were domestics. Thus, one would assume that factory workers and teachers might have greater access to day care centers. Yet, this latter arrangement is not necessarily considered an ideal option by Bogota mothers who must work. In fact, the ethnographers indicate that many women fear the poor treatment their children may receive at day care centers. In addition, the fact that the centers are most often located near a women's residence and not convenient to employment also has a negative impact on continued breastfeeding of infants.

This, naturally, leads to the question of breastfeeding breaks for women with young infants. The 1967 Labor Law authorized two thirty-minute daily rest periods for breastfeeding mothers. Of course, if the child remains at home or in a day care center in another part of the city, the legal right to breastfeeding is irrelevant. According to the ethnographers, most Bogota mothers use the time to arrive later and leave earlier in order to have more time at both ends of the workday with their children. On-site day care centers would overcome some of these hindrances to breastfeeding during the day. The ethnographers mention that high quality nurseries allow some mothers to spend the income received from their own employment on food for other siblings. For example,

"...the little bit of money that the mother is able to obtain (or food given to her) goes almost exclusively for the feeding of her infant twins. She considers the older child to have been well fed because in the San Jose nursery they give him sufficient food to eat. Therefore, at night she feeds him when she has the money, and if not, the food only goes to the (infant) twins. Feeding varies totally according to whether she has worked or been given food..."

Table 8-10 depicts how maternal employment patterns are associated with infant feeding behavior. Current work status has little effect on breastfeeding initiation, but it has a strong effect on breastfeeding duration at all measured intervals. Breastfeeding at nine months is two and a half times as frequent for women who do not work as for those who do. This is evident in the lifetable of breastfeeding for working and non working women (Figure 8-2). The median duration is much longer for women who are housewives (8.45 months) than for those who also hold other jobs (4.52 months).

According to Table 8-10, bottlefeeding behavior does not appear to be strongly influenced by work status per se. Working women seem to be only slightly more likely to bottlefeed their children at an early age. The differences are much greater in the entire group of children from 0-6 months of age. As Table 8-11 demonstrates, there is a greater tendency for working women to have weaned their children. That is, 82% of these women with children over 7 months or older have weaned, compared with 66% of housewives. Accordingly, there is greater likelihood that breastmilk will be eliminated after six months of age by working women (82%) than for non working women (66%). For mothers who work with very young infants (before the usual end of maternity leave), many more appear to use bottles early than for all working women: eighty-two percent of employed women with babies 0-2 months reported use of the bottle (Table 8-12).

The full impact of maternal work on the infant feeding outcomes can be seen by examining a set of logistic regression models which build upon those presented earlier in the background socioeconomic variables section of this report. The results of these new analyses are presented in Tables 8-13 and 8-14 which show the effect of adding a new predictor variable, WORKNOW, representing current working status, to the set of predictor variables presented earlier.

There appears to be no significant difference in breastfeeding initiation according to whether a woman is or is not working during the postnatal period. The results of the

other models (durations and early bottlefeedings) differ from initiation of breastfeeding. In the three breastfeeding durations, Working Now has a significant effect on the probability of the three outcomes. The magnitude and direction of the beta coefficients (Table 8-15) indicate that working reduces the likelihood that the child will be breastfed for longer durations, with a particularly strong association for three months' duration. Other significant relationships for education, parity, family income, and age of mothers remain unchanged from the socioeconomic model above.

Bottle feeding, interestingly, is unaffected by work status in these models. With the addition of the maternal employment variable, three additional models along with bottle by 1 month now present significant overall predictive profiles. These models are: 1) breastfeeding three months and 2) breastfeeding nine months, and 3) bottle by 2 months. This suggests that maternal employment exerts a considerable influence on infant feeding behavior in Bogota.

Once again, the adjusted risk odds ratios for each of the significant relationships were calculated. These are presented in Table 8-14. The same background variables remain significant and the odds ratios for these five variables are virtually unchanged. The effect of maternal employment is clearly important, reducing the probability of breastfeeding 3 months by about one-half.

Working and non-working mothers were analyzed separately by means of models with and without Bottle By 1 month as a predictor (see Tables 8-15 through 8-22). It is quite interesting that, for non-working mothers, birthplace exerts an influence on initiation of breastfeeding and early bottlefeeding. A mother born in Bogota is more likely not to breastfeed than a woman born elsewhere and has greater odds of <u>not</u> introducing a bottle by 2 months. For non-workers, family income is highly significantly associated with 6 and 9 months of breastfeeding. The addition of bottle by one month as an independent variable (Table 8-17) does not change the relationship of the other variables.

For working women, mother's education is a significant negative predictor of 6 months of breastfeeding. This may reflect the fact that very highly educated women constitute a higher percentage of the subsample of working women than of the non-working women. Nothing else, except mothers age (for 6 months) is significantly associated with breastfeeding duration in this group of women (Table 8-19). Bottle by 1 month as a predictor negatively affects breastfeeding durations significantly at 3 and 6 months for non-workers but at the 3 month duration only for workers (Table 8-21). There is a perplexing positive effect of early bottles on 9 months of breastfeeding. This may reflect sub-categories of workers who

are not in the formal labor force and, although use bottles, also have the opportunity to breastfeed their babies or come from socioeconomic backgrounds more likely to be associated with longer breastfeeding.

The ethnographic cases vividly illustrate the relationship between maternal employment and infant feeding behavior. Of the in-depth cases in sector I, those mothers who work outside of the home indicate that they replace the midday breastfeeding with a bottle of artificial or canned milk with starch. Usually, these prepared bottles are made at one single time for an entire day's use. One pharmacist indicated that he knew of cases where poor working women express their milk, and leave it with an older child of six or seven years. The older child drinks the milk because of his/her own hunger, and the infant goes without food. This pharmacist advises the women to use NAN or KLM or S-26 as complete milks. He says the women should leave this milk for both the infant and older children. These examples illustrate the complicated problems rooted in the poverty of these working women, where they often have no alternative but to leave infants in the care of small children in order to earn income.

One should, however, bear in mind that at the present time only 25% of Bogota women returned to work postnatally. To the degree that greater numbers of Bogota women begin to work in the future, the potentially negative effects may well become more common. Among those who do work, the impact on infant feeding patterns is primarily that of shorter breastfeeding durations. The impact on breastfeeding initiation is negligible because many employed women either receive maternity leave or they quit their jobs temporarily or permanently, immediately after birth. Breastfeeding is a universal value among all Bogota women, accounting for high initiation rates of even working women. The impact of early bottlefeeding is not so noticeable because of the prevalence of this practice throughout the population. The impact on shortening breastfeeding does not appear to be primarily via early bottlefeeding.

On the other hand, the ethnographic descriptions of the lives of those women who work suggest strongly that poor women who can earn some money have an advantage over those who depend solely on their husbands' incomes. Women who earn money can supplement their children's nutrition with more and higher quality foods. This alone must be a great incentive for women to return to work. As one mother poignantly stated:

> "...One day that I do not work is a day that I do not give soup to the children. When I have money I make them soup with a lot of bones, and always I try to give them vegetables, lentils, and beans, but one week that the children do not eat well is sufficient time for them to become malnourished...sometimes on weekends I

make them chicken soup, but that is the same as having chicks and giving them corn only once a week; it is not the same as giving it to them every day...also, if I have to work away from home, it is my fourteen-year-old son who makes the soup any which way he can..."

Full-time employment creates a dilemma for these mothers as well. Depending on the location of the child and the nature of the mother's work, women are often forced to spend their own income on bottle milks and cannot breastfeed during the day. Leaving young babies for long hours in the care of others can endanger a child's health and does not appear to allow for optimal nutrition. Thus, for some women working can become a vicious cycle where mothers earn income at the expense of leaving their children too early in life and, in turn, spend a good part of that income on bottle milk for feeding the child left at home. Of course, superior nurseries and higher minimum wages for all workers, extended to the informal sector, would alleviate some of these problems.

There may be high costs to the infant, to its mother and family, and to society for women to work under the conditions described by these women. The psychological benefits of intense and continued interactions for infants, and the physiological and nutritional value of breastfeeding early in life have been well documented. Optimal care and feeding cannot be maintained under the described working environment of the women in our sample. If a society is to successfully reproduce itself then, it must invest in its future workers through adequate nurturance and education, assuring the health and well being of its children.

The findings of this study suggest that poor women would benefit from state-supported supplementary income, and better if this were in the form of culturally-acceptable, nutritious foods for all members of the families, <u>not</u> coupons redeemable for bottle formulas. This might enable some mothers of newborns to continue breastfeeding for longer durations, and unequivocably upgrade the nutrition of all poor children. For those who must work early in the infant's life, at the very least, high quality day care centers close to work sites should be established, with guaranteed frequent breastfeeding breaks. Additionally, a public health campaign is needed to educate the informal health professionals, such as pharmacists and druggists, as to why the early use of bottle milks can compromise the nutritional status of poorer children.

This section documented cases of poor working women who were influenced in their decisions to bottle feed their infants by informal health personnel. This leads to the following section of the report, where aspects of health services, that appear to affect infant feeding behavior of the Bogota mothers, are further explored.

Table 8-1 Current Employment Status of Mother

	N	%
Working Now	175	25
Housewife	525	75
Total	700	100%

(11 missing information)

Table 8-2 Did Mother Work During Pregnancy

	N	%
Yes	253	36.2
No	446	63.8
Total	699	100.0%

Table 8-3 Association of Prenatal Employment and Current Employment of Mothers with Children ≤ 6 Months of Age

Prenatal Work	Work Now No (N)	%	Yes (N)	%
No	263	75	16	19
Yes	87	25	67	81
Total = 433	350	100%	83	100%

Age of 7 Months or Older

Prenatal Work	Work Now No N	%	Yes N	%
No	14.3	82	24	26
Yes	31	18	68	74
Total = 266	174	100%	92	100%

Table 8-4 Maternal Employment by Parity

	Worknow		Parity							
			1		2-3		4-5		6+	
	N	%	N	%	N	%	N	%	N	%
Yes	172	25	84	32	65	20	19	22	4	19
No	517	75	178	68	255	80	67	78	17	81

Table 8-5 Maternal Employment by Age of Mother

	A G E											
	12-17		18-19		20-24		25-29		30-34		35+	
Employment Status	N	%	N	%	N	%	N	%	N	%	N	%
(N=175) Yes	8	30	13	18	60	39	47	27	32	29	15	24
(N=524) No	19	70	61	82	192	61	126	73	78	71	48	76
Total												699

Table 8-6 Maternal Employment and Years of Schooling

	None		01-04		05-07		08-10		11-12		13 +		Total
	n	%	n	%	n	%	n	%	n	%	n	%	
(25%) Yes:	04	25	33	22	58	22	44	27	23	26	13	57	175
(75%) No:	12	75	114	78	206	78	117	73	64	74	10	43	523
TOTAL:	16		147		264		161		87		23		698

Table 8-7 Family Income by Maternal Employment

Income (Pesos)	Work Now			
	Yes		No	
	N	%	N	%
Lo-6000	30	23	102	77
6001-9800	23	18	108	82
9801-14000	41	25	121	75
14001-29000	45	30	106	70
29001-60000	28	38	45	62
Total	167		649	

Table 8-8 Hours Per Day Spent Away From Home by Working Women

Hours	N	%
1-3	1	0.4
4-5	10	7.6
6-7	13	9.8
8-9	52	39.4
10-12	46	34.8
13+	10	7.6
Total	132	100.0%

Table 8-9 Does Mother Take Child to Work

	N	%
Yes	26	14.9
No	148	85.1
Total	174	100.0%

Table 8-10 Maternal Employment Independent Variables by Breastfeeding Durations and Early Bottle Use (Infant Feeding Outcomes)

	EVER BREASTFED		BREASTFED 3 MONTHS		BREASTFED 6 MONTHS		BREASTFED 9 MONTHS		BOTTLE BY 1 MONTH		BOTTLY BY 2 MONTHS	
	N	%	N	%	N	%	N	%	N	%	N	%
Work Status												
No	511	97.5	241	80.6	113	63.8	45	51.7	183	32.8	146	47.2
Yes	166	94.9	84	65.1	45	47.9	12	25.0	83	34.1	58	51.6
Away From Home (Hours)												
1 - 5	10	90.0	5	71.4	4	57.1	0	0.0	3	27.3	3	30.0
6 - 7	12	92.3	6	66.7	4	66.7	1	25.0	7	53.8	9	69.2
8 - 9	51	98.1	24	60.0	9	33.3	1	8.3	15	29.4	26	54.2
10 - 12	43	93.5	22	64.7	10	43.5	3	27.3	16	36.4	24	58.5
13	42	95.5	24	72.7	16	64.0	6	40.0	10	27.8	11	32.4

Table 8-11 Bottle Use by Age of Child According to Maternal Employment

	0-06 Months				07-12 Months			
	Work		No Work		Work		No Work	
	N	%*	N	%	N	%	N	%
Breast and Bottle	07	9.0	41	18.0	0	0	0	0
Bottle Only	--	--	11	03.1	--	--	0	0
Breast, Bottle Foods	34	45.0	105	45.0	14	18.0	48	34.0
Bottle and Foods	34	45.0	77	33.0	65	82.0	94	66.0
	75		234		79		142	

Work N = 172
Non Work N = 515

Total N = 687

* Percent is total of working versus non working mothers whose children are being fed in a particular pattern according to the age of the child.

Table 8-12 Maternal Employment for Women With Infants 0-2 Months According to Bottle Use Now

Employment	Bottle Now			
	Yes		No	
	N	%	N	%
Yes (N = 28)	23	82	5	18
No (N = 189)	104	55	85	45

Total 217 children 0-2 Months

Table 8-13 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Socio-Economic and Maternal Employment Variables.

Model	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Intercept	3.6006 [1](6.88)**	1.0093 (2.26)	1.0063 (1.76)	1.4952 (1.24)	-1.3570 (7.28)**	-0.0027 (0.00)
Mother's Education	0.14677 (0.32)	0.1789 (1.72)	-0.0898 (0.34)	0.2892 (1.30)	-0.2066 (4.31)**	-0.2853 (8.01)***
Mother's Age	0.0238 (0.19)	0.0076 (0.08)	0.0065 (0.04)	-0.0428 (0.69)	0.0666 (12.71)***	0.0519 (7.16)**
Family Income	-0.2157 (0.93)	-0.1048 (0.89)	-0.1624 (1.57)	-0.5471 (6.55)**	0.0642 (0.61)	0.0659 (0.63)
Mother's Birthplace	-0.87212 (2.73)	-0.1633 (0.36)	0.0667 (0.05)	-0.0547 (0.01)	0.0069 (0.00)	-0.2234 (1.24)
Parity	0.1518 (0.13)	0.0775 (0.14)	-0.0556 (0.05)	0.0849 (0.04)	-0.4658 (10.19)**	-0.5156 (12.09)***
Worknow	-0.6462 (1.58)	-0.8276 (9.97)**	-0.5446 (3.56)*	-0.9671 (3.83)*	-0.0566 (0.78)	0.1180 (0.33)
Model X^2 r	7.05 (0.0)	13.91** (0.06)	8.51 (0.0)	13.20** (0.13)	19.53** (0.10)	23.05*** (0.13)

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 8-14 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socio-economic and Maternal Employment Variables.

	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Mother's Education					
5-7* vs none	NS	NS	NS	0.661 (0.544,0.804)	0.565 (0.464,0.689)
13+ vs 5-7*	NS	NS	NS	0.538 (0.443,0.6547)	0.425 (0.349,0.518)
Age of Mother					
20-24* vs 18-19	NS	NS	NS	1.068 (0.741,1.541)	1.053 (1.014,1.094)
30-34 vs 20-24*	NS	NS	NS	1.302 (0.903,1.879)	1.109 (1.068,1.152)
40+ vs 20-24*	NS	NS	NS	1.695 (1.176,2.447)	1.231 (1.185,1.279)
Income					
9801-14900* vs Lo-6000	NS	NS	0.335 (0.218,0.513)	NS	NS
2900-Hi vs 9801-14900*	NS	NS	0.335 (0.218,0.513)	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS
Parity 2-3*vs 1	NS	NS	NS	0.628 (0.472,0.8357)	0.597 (0.446,0.477)
6+ vs 2-3				0.393 (0.296,0.524)	0.356 (0.267,0.477)
Worknow	.437 (.262,.730)	0.580 (0.329,1.026)	0.380 (0.144,1.001)	NS	NS

*Modal Category

Table 8-15 Logistic Regression Models for Different Infant Feeding Outcomes: Beta Coefficients for Socio-Economic Variables (Non-Workers Only)

	Ever Breast-fed	Breast-fed 3 Months	Breast-fed 6 Months	Breast-fed 9 Months	Bottle By 1 Month	Bottle By 2 Months
Intercept	5.1983 (716)**	-01165 (0.02)	-0.1500 (0.02)	1.6366 (0.95)	-0.8229 (1.84)	0.5607 (0.83)
Mother's Education	-0.0450 (0.20)	0.3774 (3.27)	-.2172 (1.16)	-.5658 (3.05)	-0.2137 (3.13)	-0.2356 *(3.67)
Mother's Age	-0.0055 (0.01)	0..0351 (0.99)	0.0475 (1.43)	-0.0431 (0.49)	10.050 (5.39)	0.0171 (0.71)
Family Income	-0.1248 (0.19)	-0.170 (1.38)	-0.3846 (4.83)**	-0.8021 (7.99)***	0.0632 (0.44)	0.0760 (0.60)
Mother's Birthplace	-1.5071 (4.21)**	0.1624 (0.19)	0.0250 (0.0)	-0.2930 (0.23)	-0.2851 (1.34)	-0.5935 (5.95)**
Parity	0.0129 (0.00)	0.1614 (0.31)	-0.0833 (0.06)	0.0584 (0.01)	-0.4598 (6.97)**	-0.3495 (4.00)**
Model X^2 R	5.96 (0.0)	6.15 (0.0)	6.53 (0.0)	10.19 (0.103)	14.36** (0.094)	15.05** (0.106)

* Significant at .05 level
** Significant at .01 level
*** Significant at .001 level

[1]Numbers in () are MLE X^2 (Wald Statistic) [2]P<.09 <Considered suggestive

Table 8-16 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models for Socioeconomic Predictor Variables

(Non Workers only)

	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Mother's Education						
5-7* vs 1-4 years	NS	NS	NS	NS	NS	0.634 (0.490,0.794)
13+ vs 5-7	NS	NS	NS	NS	NS	0.493 (0.387,0.628)
Mother's Age	NS	NS	NS	NS	NS	NS
Income						
9801*-14900 vs Lo-6000	NS	NS	0.463 (0.327,0.657)	0.201 (0.115,0.351)	NS	NS
2900-Hi vs 9801-14900	NS	NS	0.463 (0.327,0.657)	0.201 (0.115,0.351)		
Mother's Birthplace	0.221 (0.052,0.934)	NS	NS	NS	NS	0.549
Parity						
2-3* vs 1	NS	NS	NS	NS	0.631 (0.449,0.888)	0.705 (0.500,0.993)
6+ vs 2-3	NS	NS	NS	NS	0.399 (0.283,0.561)	0.497 (0.353,0.700)

*Modal Category

Table 8-17 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Background Socio-economic Variables and Bottle By 1 month.

NONWORKERS ONLY

Model	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Intercept	0.0175 (0.00)	-0.3028 (0.08)	1.6470 (0.96)
Mother's Education	0.2672 (1.97)	0.2201 (1.12)	0.5541 (2.92)
Mother's Age	0.0691 (1.97)	0.0695 (1.12)	-0.0360 (2.92)
Family Income	-0.1679 (1.21)	-03977** (4.80)	-0.8148 (8.05)**
Mother's Birthplace	-0.0237 (0.00)	-0.1114 (0.07)	-0.3225 (0.27)
Parity	-0.0154 (0.00)	-0.1331 (0.15)	0.0482 (0.01)
Bottle by 1 Month	-1.4487 (15.74)***	-0.9857** (5.29)	-0.2822 (0.20)
Model X^2 r	23.30** (0.207)	11.94 (0.055)	10.66 (0.0)

*Significant .05 level; ** <.01 level; *** <.001 level
[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

*Modal Category

Table 8-18 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socio-economic Variables and Bottle by 1 Month as a predictor.

NONWORKERS ONLY

	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Mother's Education	NS	NS	NS
Mother's Age	NS	NS	NS
Income			
9801*-14900 vs Lo-6000	NS	0.451 (0.316,0.644)	0.196 (0.112,0.344)
2900-Hi vs 9801-14900	NS	0.451 (0.316,0.644)	0.196 (0.112,0.344)
Mother's Birthplace	NS	NS	NS
Parity	NS	NS	NS
Bottle by 1 Month	0.234 (0.115,0.480)	0.373 (0.161,0.864)	NS

*Modal Category

Table 8-19 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Background Socio-economic Variables. Workers Only.

Model	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Intercept	1.2934 [1](0.39)	1.57855 (2.18)	2.6591 (4.05)*	0.1670 (0.00)	-2.7005 (7.76)**	-1.4250 (2.21)
Mother's Education	0.3633 (0.76)	-0.0291 (0.02)	-0.5666 (4.34)**	-0.4137 (0.67)	-0.2359 (1.66)	-0.5003 (6.69)**
Mother's Age	0.0548 (0.41)	-0.0250 (0.35)	-0.0970 (2.44)	-0.0505 (0.28)	0.1062 (8.24)***	0.1430 (11.49)***
Family Income	-0.3638 (0.91)	0.0371 (0.04)	0.3313 (2.06)	0.0605 (0.02)	0.0755 (0.21)	0.0884 (0.29)
Mother's Birthplace	-0.0939 (0.01)	-0.5241 (1.54)	0.1250 (0.06)	0.4584 (0.26)	0.6554 (3.10)	0.6158 (2.68)
Parity	0.4202 (0.37)	-0.618 (0.04)	0.0172 (0.00)	0.2093 (0.08)	-0.5053 (3.46)	-1.0203 (11.39)***
Model X^2 r	2.35 (0.0)	2.31 (0.0)	9.29 (0.0)	2.33 (0.0)	10.70* (0.060)	18.22** (0.217)

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 8-20 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models with Background Variables

	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Mother's Education						
5-7* vs None	NS	NS	0.322 (0.189,0.549)	NS	NS	0.368 (0.253,0.537)
13+ vs 5-7	NS	NS	0.183 (0.107,0.312)	NS	NS	0.223 (0.153,0.326)
Mother's Age						
20-24* vs 18-19	NS	NS	NS	NS	1.112 (1.034,1.196)	1.54 (1.062,1.253)
30-34 vs 20-24	NS	NS	NS	NS	1.237 (1.150,1.330)	1.331 (1.225,1.446)
40+ vs 20-24	NS	NS	NS	NS	1.530 (1.423,1.645)	1.772 (1.631,1.925)
Income	NS	NS	NS	NS	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS	NS
Parity						
2-3* vs 1	NS	NS	NS	NS	NS	0.360 (0.199,0.652)
5+ vs 2-3	NS	NS	NS	NS	NS	0.130 (0.072,0.235)

*Modal Category

Table 8-21 Logistic Regression Models for Different Infant Feeding Outcomes: Beta Coefficients for Background Socio-economic Variables, and Bottle By 1 Month as Predictors.

WORKERS ONLY

Model	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Intercept	1.2876 [1](1.40)	2.5127 (3.50)	2.8123 (0.94)
Mother's Education	-0.1035 (0.21)	-0.5402 (3.88)**	-0.4804 (0.71)
Mother's Age	0.0150 (0.10)	-0.0779 (1.46)	-0.1926 (2.29)
Family Income	0.0071 (0.00)	0.2799 (1.42)	0.1433 (0.09)
Mother's Birthplace	-0.3972 (0.84)	-.10577 (0.04)	-0.0084 (0.00)
Parity	-0.2567 (0.58)	-0.0642 (0.03)	0.5492 (0.39)
Bottle by 1 Month	-0.9240** (3.95)	-0.4249 (0.54)	2.3984 (4.15)**
Model X^2 r	6.12 (0.0)	8.52 (0.0)	7.73 (0.0)

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 8-22 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socio-economic and Bottle by 1 Month predictor variables.

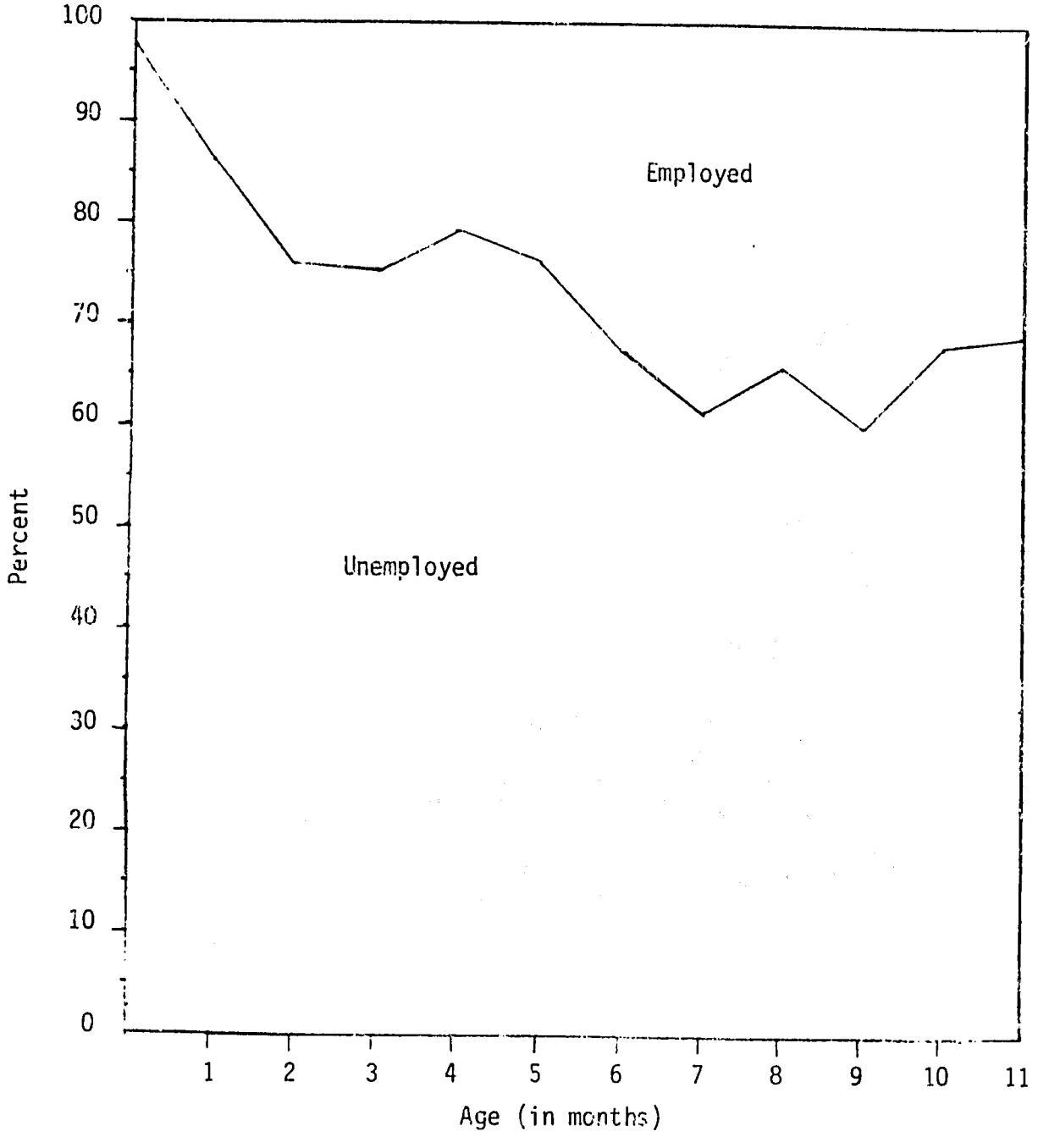
WORKERS ONLY

9 Months	Breastfed	Breastfed	Breastfed
Mother's Education			
5-7* vs None	NS	0.339 (0.198,0.581)	NS
13+ vs 5-7	NS	0.198 (0.116,0.338)	NS
Mother's Age	NS	NS	NS
Income	NS	NS	NS
Mother's Birthplace	NS	NS	NS
Parity	NS	NS	NS
Bottle by 1 Month	0.397 (0.159,0.988)	NS	11.007 (3.392,35.717)

*Modal Category

Figure 8-1

Percentage of Employed and Unemployed Women by Age of Child



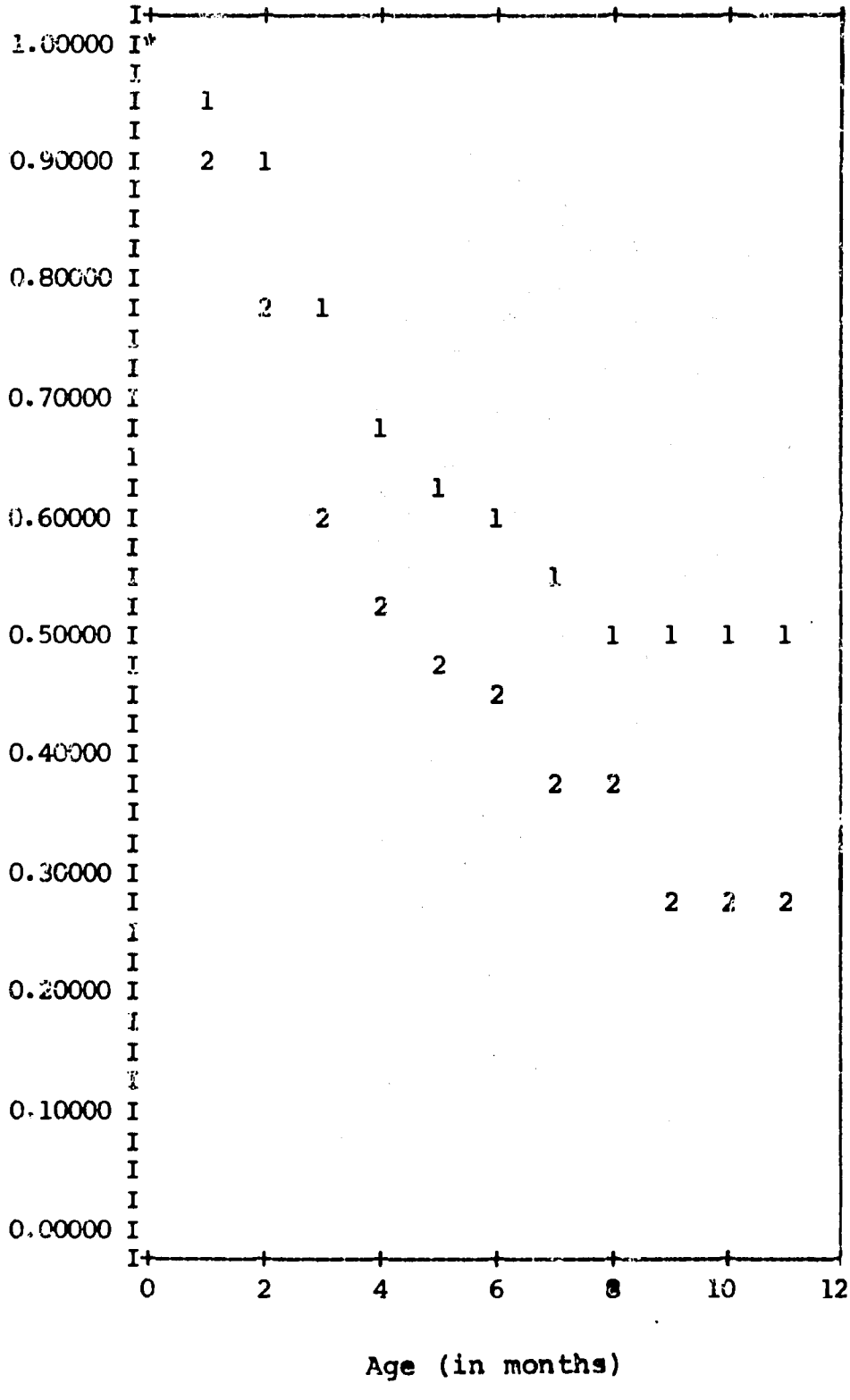
Key:

Unemployed (n = 525, 75%)

Employed (n = 175, 25%)

Figure 8-2

Duration of Breastfeeding by Current Work



Key:

		N	Median Survival
1	No	474	8.49
2	Yes	158	6.52

* = more than one group

Chapter IX DETERMINANTS OF INFANT FEEDING PRACTICES: HEALTH SERVICES

A major hypothesis of this work has been that the health care sector shapes women's decisions regarding infant feeding. This may happen either overtly, through services, care and recommendations given by health professionals and institutions, or by their implicit attitudes and values. Consequently, this section will appraise aspects of health services in Bogota to determine what effect they may have on initiation and duration of breastfeeding and early supplementation with bottle milks.

The health care system in Bogota consists of both government and private facilities and institutions. The public health sector provides services within the National Health Service (under the Ministry of Health) and the National Social Security System (under the Ministry of Labor). The latter consists of the Institute of Social Security (ISS), Caja Nacional (Cajanal) and Las Cajas de Compensacion. These three institutions serve different populations depending upon type of service and where the user is employed. The ISS serves private sector employees and families; Cajanal is for government workers. In both cases, services are provided by hospitals or clinics run by one of these two institutions. In comparison, workers who are not covered by these agencies or unemployed families are eligible for services provided through hospitals and centers run by the National Health Service.

The private health care sector includes both private practice medicine, the Office of Family Compensation (covering employees of private enterprises who subscribe) and non-physician practitioners such as midwives, druggists, pharmacists, healers and other non-licensed health care providers. Some pharmacists are un-licensed by the Ministry of Health. Poor families with heads of households who are unemployed or are in the informal economy most often utilize the non-physician practitioners even though they are eligible for services provided by the National Health Service.

The ethnography provides examples which indicate that understaffing at Government health care centers results in overcrowding and day-long waits for attention. For example,

> "...The new generations hardly use them, because you can waste an entire day trying to arrange an office visit and you have to take time off from work to do it. You must get there before 7 a.m. in order to get the blessed appointment, then you must wait for the doctor on duty who arrives at 9, 10, 11 or 12. It is better to go to the drug store. There they don't make

you wait, they only charge for the visit in special cases and their earnings are in the sale of the drug..."

Proximity, convenient hours and familiarity with neighborhood pharmacists, druggists and midwives most likely contribute to their use, while long hours and impersonal care are clearly disincentives to use public health services. Higher fees for private physicians are obstacles to use of their services for poor women...

"...We prefer the drugstore of Don Tomas because he attends us better, if you don't have money he won't charge you, and besides that we have faith in him..."

This last mothers' comment underscores what many studies of practitioner-utilization have shown, that is, that families who are eligible for free government health care may still choose informal practitioners. Reasons include the social status of the professional in question, (that is, he or she is closer to the user's class and, therefore, patients feel more comfortable) and a shared system of values and beliefs between the informal practitioners and their clients. In Bogota, pharmacists and druggists ascribe to the hot and cold theory of disease and health, they are aware of the difficulties of optimal care and nutrition for poor women and their families, and their prescriptions often reinforce and validate the women's attitudes and cultural responses to illness. To illustrate, one pharmacist advised some of the mothers not to give their children cold foods because "they could catch a cold in their stomach, but instead to give them something lukewarm..." The choice of an informal health care worker is an important cultural preference that should not be disregarded when considering health policies or educational campaigns directed at health workers from all sectors.

A distinctive feature of maternity health services in Bogota is that a majority of the women (88%) received some form of prenatal care (Table 9-1), and that 90% of the births occurred in hospitals (Table 2-25, above). Table 9-2 shows the distribution of prenatal care locations, with almost one half of the women attended by public health service professionals, 32% by other national health professionals and 22% by private practice physicians. Ethnographic information mentions that although most women ultimately received prenatal care, poor women often did not visit a physician or clinic until after the sixth month of pregnancy. Mothers were also asked if they had ever received advice on infant feeding from medical personnel during the pregnancy and prenatal period. Tables 9-3 through 9-5 present the results of these queries. Only 31% of the sample received such advice during pregnancy. Of these, 71% received advice from

physicians or public health professionals. Thus, despite reliance on the informal health workers, most of these mothers received maternity care and advice from medical professions.

Most of the prenatal advice concerned feeding of infants. Forty-four percent were recommended to breastfeed, 29% were told types and quantities of foods for children, and 9% were advised to use bottle milks (Table 9-5). Table 9-6 indicates that public health sector doctors more frequently suggested the use of formula to their pregnant clients than private physicians. Moreover, 67% of the private sector doctors recommended breastfeeding to their patients as compared with 52% of the public sector employees. Children of employees covered by benefits of the Institute of Social Security are eligible to receive "canned" milk for their babies up until six months of life. This "benefit" may encourage some public health workers to over-state the value of supplementation. This possibility will be discussed in later sections of this report.

Several aspects of mothers' experiences with institutional deliveries are described in Tables 9-7 through 9-13. Just over 10% of the women had Caesarean sections, and less than 5% were discharged from the hospital before their infants. Table 9-9 describes the range of medical problems in infants which resulted in these delayed discharges. Despite the fact that 90% of the children were born in hospitals, only 6.2% of the women received formula samples during their maternity stays (Table 9-10). Eighty-seven percent of the newborns remained in the same room with their mother in the hospital. The remainder (13%) were placed in the hospitals' nurseries (Table 9-11). It has been postulated that separation of the mother and child at birth could contribute to the failure of some women to initiate breastfeeding and, conversely, that rooming-in would encourage breastfeeding.

Women were also asked whether they received feeding advice immediately after the birth of their infant and, if so, from whom and the content of that advice. Tables 9-12 through 9-14 present the results of those questions. Only 27% of the sample reported receiving feeding advice in the first few postpartum days. Of those, almost half received advice from public health doctors or workers and 18% from a private physician. Sixty-five percent received advice regarding breastfeeding, 20% about formula use and 15% about foods (type and timing). When source of neonatal advice is cross-tabulated by type of advice (Table 9-15), a trend (not unlike that in Table 9-6 for prenatal advice) is seen. Although public health physicians offered 50% of all advice regarding breastfeeding, about one-quarter of the time they gave advice regarding formula use. An interesting change from pre to post natal advice appears here: whereas only 3% of prenatal advice had to do with formula use, 19% of the postpartum advice offered by private doctors had to do with bottlefeeding.

Advice given by particular physicians and health professionals often runs counter to accepted medical recommendations. For example, the ethnographers documented one mother who brought her child to a physician because the child was suffering serious diarrhea. When the doctor told her that the diarrhea was due to breastfeeding, the mother asked, "What, then, is all this propaganda promoting breastfeeding, if it causes diarrhea in babies?" The success of the educational campaign has, in this instance, been undermined by the individual physician's ignorance. In another case, a doctor advised a mother who had a cold to stop breastfeeding in order to protect the child. In a different incident, a physician recommended cessation of breastfeeding a child who was over 12 months of age because, as the mother stated, "he said it would finish me off."

There appears to be some underlying factor here encouraging some physicians to give inappropriate advice to the mothers of young children. We believe this goes beyond inadequate education, although clearly that is involved. In any event, the damage done by such advice can be far-reaching . Recommendations to cease breastfeeding convey the idea that breastfeeding can harm children. It is thus an intrinsic valuation or judgement of motherhood, of women's roles and, by extension, women's value. In other words, women who breastfeed are labelled as incompetent and in need of guidance in their role as producers and caretakers. In this sense, traditional female control over children becomes appropriated by the professional.

This attitude was seen in the section on Details of Breastfeeding, where numerous examples were provided of fathers and grandfathers who suggested cessation of breastfeeding for women with small infants. It appears here with the reinforced institutional power of western medicine. In previous chapters, women described a decline in their standard of living and in the quality of their lives. They mentioned that their younger children who were born in Bogota are more malnourished, smaller in stature and more frequently ill than older children born elsewhere. The data do not permit assessment of the accuracy of this statement. It appears, however, that these women are relating not only a decline in perceived standards of living, but in status and position as well.

By way of comparison, the following statement is from a midwife, who gives advice on infant feeding and care to women in her neighborhood.

> "...I tell people who ask me that during the first two months of their babies' lives they don't need to feed anything but breastmilk... but they should wash their hands before feeding the children and preparing food...There are some who are resistant to breastfeeding, they resist because maybe they want to

preserve their figure...I advise them that if they resist breastfeeding, the NAN formula seems good to me or Nestogeno. At times, mothers don't have the means to buy milk, then they dilute it...what can be done?"

This midwife understands the superior nutritional quality of breastfeeding, although she is not always able to communicate that knowledge to her clients. The implication here is that values regarding aesthetics (sexual appeal) entered into some women's decisions to wean their infants.

Table 9-16 presents cross tabulations of six infant feeding outcomes with four health service variables. The first health services variable is place of infants' birth (home and various institutions). Infant feeding practices appear to vary somewhat depending upon the location of birth. The prevalence of initiation is highest (99 and 98% respectively) among home and private hospital births. Public hospitals and social security hospitals have a lower prevalence (96%). The same trend is recognizable to a greater degree with respect to breastfeeding for three and six months' duration. There is an opposite trend for introduction of bottle feeding by one and two months; mothers with babies born in Social Security hospitals have a higher percentage of introducing a bottle at these two intervals. Lifetable analysis based on retrospective data corroborates these tendencies. As Figure 9-1 shows, Social Security hospitals have the lowest proportions of breastfeeders at all durations.

Clearly, then, infant feeding practices of children born in Bogota appear to differ depending on place of birth. Whether this is because of specific attributes of the health care institutions in question or if it is because of confounding with other maternal attributes must be examined. Among specific practices, rooming in, prenatal care and neonatal advice may exert some influence over mothers' decisions regarding feeding outcomes. Most clearly, rooming in appears to discourage early bottle feeding (Table 9-16). Lifetable analysis corroborates the association between contact in the hospital and breastfeeding durations. Figure 9-2 shows clearly that those who room-in have a higher proportion of breastfeeders at each age interval. The lifetable also highlights an apparently greater effect after four months of age. This suggests that a rooming-in policy and procedure in the first days of life may have a real impact on breastfeeding behavior for months afterwards.

Finally, receiving neonatal advice immediately after the birth of a child appears to have little effect on feeding outcomes except possibly to make more likely the introduction of early bottles. The lifetable shows very little difference in duration for those who did and did not receive advice. From the great variety of specific advice reported, it is not surprising that no particular trend emerges. The ethnography case study

mothers in sector II utilize CAFAM, IDUFAMILIAR, ICSS, Boyaca Health Centers, the Children's Hospital and private pediatricians for health care and appear to be at high risk of introducing bottle milks too early because of the advice of professional health workers. Private physicians in this sector have recommended S-26 to be given immediately after birth as well as Figuestomil and Ferrimison to enhance the child's appetite. Physicians have advised against night feeding because it caused indigestion. Physicians in other sectors have also recommended weaning with formula. The ethnography discusses how some mothers do not breastfeed most of the time because they do not trust the quality of their milk, a perception reinforced by health professionals. One mother states...

> "...the milk is very light or clear, it is not thick...the doctor from La Victoria told me that my milk is clear because it is not good..."

The commercial marketing section of this report has discussed the distribution of free bottle and can milks in general.

In an effort to determine the statistical significance of health services on various infant feeding outcomes, a logistic regression was again fit. In these analyses, the model is expanded to include one health service variable (rooming-in) as an additional predictor. Since other health service components appeared to influence outcomes (i.e., prenatal care, location of birth of child, receipt of a free formula sample, C-section, advice given postnatally) several other possibilities were explored. Most were either too rarely present in the population, or not clearly defined. None, except rooming-in, added to the explanatory power of the models. Since social security hospitals appeared in cross-tabulations and ethnographic data to affect breastfeeding durations negatively and, most importantly, increase the probability of early bottle, a number of experimental logistical analyses were also attempted for the location of birth. Birthplace proved not to be a statistically significant predictor of feeding outcomes when other socioeconomic variables were controlled.

The results of adding rooming-in to the logistic regression are presented in Tables 9-17 and 9-18. Tables 9-19 and 9-20 also include early bottle in the predictor group. All prior significant relationships remain stable (compare Table 9-20 with Table 7-2) after the addition of the new predictor. After controlling for the effect of the other variables, rooming-in does not have a significant relationship to any of the dependent variables. The addition of "rooming-in" to the model does, however, increase the overall model chi square for the dependent

variables. It also does not significantly change any of the adjusted risk odds ratios. In the regression using bottle by 1 month as a predictor variable (Table 9-19 and 9-20), bottle by 1 month is significant for the 3 and 6 month durations, but rooming-in remains statistically insignificant.

Finally, working and non-working women were analyzed separately by means of models with and without early bottles as predictors (Tables 9-21 through 9-26). Rooming-in yielded a highly significant beta coefficient for the 3 months model for non-workers only (Table 9-21), and for both 3 and 6 months in models when early bottles were controlled (Table 9-25 and 9-27). As Table 9-22 shows, a non-working woman who has roomed in is 4 times as likely to breastfeed at 6 months as one who was separated from her child at birth. This underscores the important influence of rooming-in for women who do not work. With respect to working women, they may curtail breastfeeding or introduce early bottles regardless of their birth experiences. Use of bottle by 1 month is clearly related to breastfeeding duration for both working and non-working mothers, but again, not nearly so much for the working as non-working mothers. It appears that women who work are so strongly pushed towards shorter breastfeeding that few other determinants act strongly upon them.

The interaction between aspects of health services, socioeconomic parameters, and infant feeding behavior may be much more complex than conventional regression techniques can assess. This is seen in part by the statistically significant outcome for one health services variable (rooming-in) only when working versus non-working mothers are analyzed separately. On the other hand, additional supporting evidence is provided by our qualitative data. The ethnographic detail enables an elucidation of the general pattern of causation and the possible arenas for development of policies for intervention. The ethnographic data, in fact, do provide suggestions as to what aspects of the health services experience may be influencing a tendency towards shortened duration of breastfeeding and early initiation of bottle feeding. As mentioned previously, most of the women in the sample had hospital births. Many of those in sector II, especially the middle and lower middle income women, continued to use government health centers, hospitals and private pediatricians postnatally. All women in the in-depth interviews from sector II experienced a period of separation from their infants at birth in the hospital, and their children were given either Dextrose or artificial milks. Many of the doctors affiliated with the health care facilities utilized by the case study mothers recommended milk brands to their clients such as Klin and Nestogeno. Private physicians recommended other items be given right after birth to enhance the child's appetite. Thus, the idea that breastmilk is not the most nutritious or

complete food is established at birth or shortly thereafter for these women and their infants.

Poorer mothers in sector III case studies who had hospital births were enrolled in a PAN coupon program, which meant that they had access to subsidized packaged foods through the national feeding plan. The ethnographers demonstrate a large influence of the professional health sector to introduction of early milk complements. For example, as one mother reports:

> "...When my baby girl was one and one-half months old, I took her to the dispensary for a routine check-up, and they told me that she was doing very well. They gave me two free cans of Pelargon milk and told me to start giving it to her when my milk started to dry off..."

This mother never really understood why they gave her the free milk or whether her milk supply was sufficient or if the baby's weight and height were correct for her age. In another instance a two month old infant had amoebic dysentery. The doctor recommended that the mother cease breastfeeding. He then suggested different milks:

> "...first, AL 110; then Isomil because the baby wouldn't assimilate sugars or fats well. But after the fourth month the baby refused this milk, so the doctor recommended S-26..."

Other examples can be presented. Although they may not provide a statistical basis to demonstrate causality between advice from medical personnel and diminished duration of breastfeeding, the data does capture the predilection of these professionals to recommend artificial milks too early in infants' lives. Indeed, the power of the medical professions to influence women to choose less than optimal nutritional regimes for their newborns cannot be dismissed. The ethnographers have identified several areas of misinformation viz., poor advice and bad practice. An educational campaign directed specifically at the professional health community might begin to reverse this tendency.

Table 9-1 Mother Received Prenatal Care

	(N)	%
Yes	613	88
No	86	12
Total	699	100%

Table 9-2 Location of Prenatal Care

	(N)	%
Public Health Service Professional	285	46
Social Security, Family Subsidy or Red Cross, etc. Professional	196	32
Private Physician or Clinic	133	22
Informal Practitioner	2	-
Total	616	100%

Table 9-3 Advice on Infant Feeding During Pregnancy

	(N)	%
Yes	218	31
No	480	69
Total	698	100%

Table 9-4 Who Gave Prenatal Advice

	(N)	%
Public Doctor or Health Professional	118	55
Relatives	48	22
Private Physician	34	16
Media	13	6
Informal Health Professionals	1	1
Total	214	100%

Table 9-5 Type of Advice

	(N)	%
Breastfeeding	92	44
Foods for Infants	61	29
Formula use	18	9
Other (health of mother, general baby care, etc).	38	18
Total	209	100%

Table 9-6 Type of Prenatal Advice According to Source of Advice

Advice	Private Physician		Public Physician		Media		Relations	
	(N)	%	(N)	%	(N)	%	(N)	%
Breast-feeding	20	67 (22%)*	48	52 (52%)	5	63 (5%)	18	46 (20%)
Formula	1	- (6%)	10	11 (59%)	2	25 (12%)	4	10 (24%)
Foods	9	30 (27%)	34	37 (29%)	1	12 (8%)	17	44 (35%)
Total	30	100	92	100	8	100	39	100

*Numbers in parentheses refer to percentage of total advice according to type.

Table 9-7 Caesarean Section

	N	%
Yes	71	10.2
No	627	89.8
Total	698	100.0%

Table 9-8 Child Left Hospital With Mother

	N	%
Yes	598	95.5
No	28	4.5
Total	626	100.0%

Table 9-9 Reason Child Did Not Leave Hospital With Mother

	N
Premature	7
Low birth weight, yellow color	5
Respiratory difficulties	4
Low birth weight	3
Blood transfusion	3
Illness of mother	2
"Mistreated" at birth	1
Blood tests	1
Spots	1
Total	27

Table 9-10 Mother Received Formula Sample from Hospital

	N	%
Yes	44	6.2
No	666	93.8
Total	710	100.0%

Table 9-11 Location of Infant After Birth

	(N)	%
Same Room as Mother	600	87
Hospital's Nursery	93	13
Total	693	100%

Table 9-12 Neonatal Advice

	(N)	%
Yes	188	27
No	510	73
Total	698	100%

Table 9-13 Source of Advice

	(N)	%
Private Physician/ Health Worker	89	47
Relations	59	32
Public Health Physician/ Worker	34	18
Midwife	4	2
Media	2	1
Total	188	100%

Table 9-14 Type of Neonatal Advice

Total	(N)	%
Breastfeeding	110	65
Formula	34	20
Foods	26	15
Total	170	100%

Table 9-15 Type of Neonatal Advice by Source of Advice

	Private Physician		Public Physician		Midwife		Media		Relations	
	(N)	%	(N)	%	(N)	%	(N)	%	(N)	%
Breastfeeding	24	(21.8) (77)*	55	(50.0) (66)	2	(1.8) (50)	1	(0.9) (100)	28	(25.5) (56%)
Formula	6	17.6 (19)	19	55.9 (23)	2	5.9 (50)	0	-	7	20.6 (14%)
Foods	1	3.8 (4)	10	38.5 (11)	0	-	0	-	15	57.7 (30)
Total	31	100%	84	(100)	4	100	1	(100)	50	(100)

* Percentage of Source Giving Advice N = 170

Table 9-16 Crosstabulations of Health Services Independent Variables with Dependent Variables

	Ever Breastfed		Breastfed 3 Months		Breastfed 6 Months		Breastfed 9 Months		Breastfed 1 Month		Bottle By 2 Months	
	N	%	N	%	N	%	N	%	N	%	N	%
Place of Birth:												
Public Hospital	319	96.1	140	73.3	74	59.7	25	39.7	89	30.6	119	45.4
Private Hospital	126	98.4	59	76.6	27	58.7	5	27.8	42	35.9	48	47.1
Home	72	98.6	38	80.9	18	56.2	5	38.5	20	30.3	29	48.3
Social Security Hospital	158	96.9	64	71.1	23	43.4	8	29.6	51	37.0	67	54.5
Room In												
No	28	94.6	40	71.4	14	41.2	4	26.7	33	39.3	43	56.6
Yes	583	97.2	259	75.3	127	58.3	39	36.8	170	32.4	220	47.1
Prenatal Care												
Yes	594	96.9	262	73.8	125	55.6	39	36.1	183	34.0	239	49.6
No	82	96.5	39	79.6	16	55.2	4	33.3	21	28.0	26	40.0
Neonatal Advice												
Yes	179	95.0	101	74.3	44	51.2	14	34.1	63	38.4	81	54.4
No	497	97.6	201	74.7	98	58.0	30	37.5	140	31.3	183	46.1

Table 9-17 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Socio-economic and Health Services Variables

Model	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Intercept	2.7280 (3.11)[1]	0.9099 (1.36)	0.3027 (0.12)	1.0063 (0.44)	-1.1396 (3.86)*	-0.4775 (0.66)
Mother's Education	0.1578 (0.37)	0.1723 (1.61)	-0.0742 (0.23)	0.3489 (1.97)	-0.2124 (4.49)**	-0.2958 (8.46)***
Mother's Age	0.0240 (0.20)	-0.0059 (0.05)	0.0100 (0.10)	-0.0439 (0.74)	0.0661 (12.36)***	0.0485 (6.22)**
Family Income	-0.2236 (1.02)	-0.1385 (1.59)	-0.1860 (2.04)	-0.5795 (7.66)**	.540 (0.43)	.593 (0.51)
Mother's Birthplace	-0.8867 (3.83)	-0.3140 (1.37)	-0.0422 (0.02)	-0.1905 (0.16)	-0.0080 (0.00)	-0.2343 (1.36)
Parity	0.1976 (0.23)	0.1402 (0.45)	-0.0714 (0.08)	-.1739 (0.18)	-0.4635 (10.19)**	-0.5112 (12.07)***
Rooming In	0.6961 (1.35)	0.2808 (0.67)	0.5985 (2.24)	0.0393 (0.00)	-0.2021 (0.61)	-0.3606 (1.81)
Model X^2 r	6.62 (0.0)	3.96 (0.0)	7.61 (0.0)	9.85 (0.0)	20.58 (0.111)**	23.69 (0.134)***

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 9-18 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models with Socio-economic and Health Services

	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Mother's Education						
5-7* vs 1-4 years	NS	NS	NS	NS	0.809 (0.664,0.984)	0.744 (0.672,0.824)
13+ vs 5-7	NS	NS	NS	NS	0.529 (0.434,0.643)	0.412 (0.337,0.502)
Age						
20-24* vs 18-19	NS	NS	NS	NS	1.068 (1.029,1.109)	1.050 (1.010,1.091)
30-34 vs 20-24	NS	NS	NS	NS	1.142 (1.100,1.184)	1.102 (1.061,1.450)
40+ vs 20-24	NS	NS	NS	NS	1.303 (1.256,1.352)	1.214 (1.169,1.262)
Income	NS	NS	NS	NS	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS	NS
Parity						
2-3* vs 1	NS	NS	NS	NS	0.629 (0.473,0.836)	0.560 (0.449,0.800)
6+ vs 2-3	NS	NS	NS	NS	0.396 (0.298,0.526)	0.359 (0.270,0.480)
Rooming In	NS	NS	NS	NS	NS	NS

*Modal Category

Table 9-19 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Socio-economic, Health Services, and Bottle by 1 Month as Predictors.

Model	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Intercept	0.9244 [1](1.28)	0.0578 (0.00)	1.3343 (0.75)
Mother's Education	0.0935 (0.43)	-0.0681 (0.19)	0.3781 (2.23)
Mother's Age	0.0305 (1.13)	0.0332 (1.00)	-0.0568 (1.16)
Family Income	-0.1564 (1.84)	-0.2130 (2.56)	-0.6114 (8.09)**
Mother's Birthplace	-0.3748 (1.80)	-0.1176 (0.14)	-0.2813 (0.33)
Parity	-0.0582 (0.07)	-0.1543 (0.37)	0.1579 (0.14)
Bottle by 1 Month	-1.3178 (22.90)***	-0.8821 (6.85)**	0.4481 (0.75)
Rooming In	0.3567 (1.00)	0.7146 (3.02)	0.0837 (0.02)
Model X^2	27.46***	15.33**	11.16
r	(0.179)	(0.075)	(0.0)

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 9-20 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Socio-economic, Health Services, and Bottle By 1 Month as Predictors.

	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Mother's Education	NS	NS	NS
Age	NS	NS	NS
Income			
9801*-14900 vs Lo-6000	NS	NS	0.294 (0.193,0.449)
2900-Hi vs 9801-14900	NS	NS	0.294 (0.193,0.449)
Mother's Birthplace	NS	NS	NS
Parity	NS	NS	NS
Bottle by 1 Month	0.268 (0.154,0.464)	0.414 (0.214,0.801)	NS
Rooming In	NS	NS	NS

*Modal Category

Table 9-21 Logistic Regression Models for Different Infant Feeding Outcomes: Socio-economic, and Health Services Variables for Non-Workers

Model	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Intercept	4.5693 (4.51)**[1]	-0.9118 (0.76)	-1.6534 (1.85)	1.1811 (0.39)	-0.5738 (0.70)	0.9133 (1.67)
Mother's Education	-0.0354 (0.01)	0.3201 (3.01)	0.2120 (1.04)	0.5601 (3.01)	-01.2130 (3.07)	-0.2296 (3.44)
Mother's Age	0.0009 (0.00)	0.0387 (1.14)	0.0615 (2.22)	-0.0377 (0.37)	0.0518 (5.46)**	0.0151 (0.44)
Family Income	-0.1282 (0.20)	-0.1577 (1.15)	-0.3696 (4.26)**	-0.7987 (7.87)**	0.0508 (0.28)	0.0594 (0.36)
Mother's Birthplace	-1.4810 (4.08)**	0.1555 (0.17)	-0.0668 (0.03)	-0.2873 (0.22)	-0.2904 (1.38)	-0.6105 (6.11)**
Parity	0.005 (0.00)	0.1656 (0.33)	-0.1357 (0.15)	0.0253 (0.00)	-0.4570 (6.79)**	-0.3167 (3.26)
Rooming In	0.5293 (0.42)	0.8078 (3.47)	1.4083 (6.26)**	0.4340 (0.28)	-0.2854 (0.85)	-0.3119 (0.91)
Model X^2 r	6.16 (0.0)	9.15 (0.0)	13.45** (0.098)	10.36 (0.0)	15.75 (0.087)**	15.13 (0.085)**

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 9-22 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models for Different Infant Feeding Outcomes: Socio-economic and Health Services Variables (Non Workers)

	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Mother's Education	NS	NS	NS	NS	NS	NS
Age						
20-24* vs 18-19	NS	NS	NS	NS	1.053 (1.008,1.101)	NS
30-34 vs 20-24	NS	NS	NS	NS	1.109 (1.062,1.159)	NS
40+ vs 20-24	NS	NS	NS	NS	1.230 (1.178,1.285)	NS
Income						
9801*-14900 vs Lo-6000	NS	NS	0.477 (0.336,0.678)	0.202 (1.116,0.354)	NS	NS
2900-Hi vs 9801-14900	NS	NS	0.477 (0.337,0.678)	0.202 (1.116,0.354)	NS	NS
Mother's Birthplace	.244 (0.058,1.027)	NS	NS	NS	NS	0.543 (0.335,0.881)
Parity						
2-3* vs 1	NS	NS	NS	NS	0.633 (0.449,0.893)	NS
6+ vs 2-3	NS	NS	NS	NS	0.401 (0.284,0.565)	NS
Rooming In	NS	NS	4.089 (1.356,12.327)	NS	NS	NS

*Modal Category

Table 9-23 Logistic Regression Models for Different Infant Feeding Outcomes: Socio-economic and Health Services Variables (Workers)

Model	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle By 1 Month	Bottle By 2 Months
Intercept	-0.3151 (0.02)[1]	2.8086 (4.52)**	4.3756** (6.53)*	0.9004 (0.10)	-2.6903** (5.61)	-0.6942 (0.37)
Mother's Education	0.4480 (1.07)	-0.1246 (0.31)	-0.7169** (6.01)	-0.4263 (0.71)	-0.2419 (1.73)	-0.5397 (7.54)*
Mother's Age	0.0701 (0.64)	-0.0373 (0.73)	-0.1239* (3.66)	-0.0520 (0.30)	0.1042** (7.82)	0.1360 (10.30)**
Family Income	-0.3383 (0.78)	0.0644 (0.12)	0.3859 (2.54)	0.0093 (0.00)	0.0827 (0.25)	0.0902 (0.30)
Mother's Birthplace	0.0346 (0.00)	-0.6094 (2.03)	-0.0122 (0.00)	0.3883 (0.18)	0.6451 (2.98)	0.5662 (2.24)
Parity	0.4528 (0.40)	-0.1035 (0.10)	0.0039 (0.00)	0.2475 (0.10)	-0.5058 (3.46)	-1.0368 (11.70)***
Rooming In	1.0270 (1.20)	-0.6917 (1.37)	-0.7915 (1.29)	-0.6294 (0.20)	010603 (0.02)	-0.4593 (0.87)
Model X^2 r	3.83 (0.0)	4.71 (0.0)	12.65* (0.114)	2.53 (0.0)	10.31 (0.0)	18.74** (0.202)

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 9-24 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models with Background Variables

	Ever Breastfed	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Bottle by 1 Month	Bottle By 2 Months
Mother's Education						
5-7* vs 1-4 years	NS	NS	0.488 (0.275,0.866)	NS	NS	0.583 (0.396,0.857)
13+ vs 5-7	NS	NS	0.116 (0.066,0.206)	NS	NS	0.198 (0.135,0.291)
Age						
20-24* vs 18-19	NS	NS	0.883 (0.778,1.003)	NS	1.110 (1.032,1.194)	1.146 (1.054,1.245)
30-34 vs 20-24	NS	NS	0.780 (0.687,0.886)	NS	1.232 (1,145,1.325)	1.313 (1.208,1.426)
40+ vs 20-24	NS	NS	0.609 (0.536,0.692)	NS	1.517 (1.410,1.632)	1.723 (1.586,1.872)
Income	NS	NS	NS	NS	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS	NS
Parity						
2-3* vs 1	NS	NS	NS	NS	NS	0.355 (1.95,0.64)
6+ vs 2-3	NS	NS	NS	NS	NS	0.126 (0.0720,0.227)
Rooming In	NS	NS	NS	NS	NS	NS

*Modal Category

Table 9-25 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Socio-economic, Health Services, and Bottle by 1 Month as Predictors. Non Workers.

Model	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Intercept	-0.9963 (0.78)	-2.3184 (3.15)	-.0480 (0.30)
Mother's Education	0.2482 [1](1.60)	0.2239 (1.01)	0.5454 (2.85)
Mother's Age	0.0780 (3.73)*	0.0969 (4.47)**	-0.0279 (0.19)
Family Income	-0.1518 (0.95)	-0.3934 (4.25)**	-0.8115 (7.91)**
Mother's Birthplace	-0.0197 (0.00)	-0.2515 (0.33)	-0.3101 (0.00)
Parity	-0.0176 (0.00)	-0.2095 (0.33)	0.009 (0.00)
Bottle by 1 Month	-1.5860 (17.72)***	-1.3888 (8.74)**	-0.3537 (0.30)
Rooming In	0.9958 (4.64)**	1.7793 (8.57)**	0.5581 (0.45)
Model X^2	28.61***	22.19**	10.96
r	(0.242)	(0.229)	(0.0)

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

Table 9-26 Logistic Regression Models for Different Infant Feeding Outcomes: Beta-Coefficients for Socioeconomic, Health Services, and Bottle by 1 Month as Predictors. (Workers)

Months	Breastfed 3 Mos	Breastfed 6 Mos	Breastfed 9 Mos
Intercept	2.5190 (3.58)*	4.1832 (5.97)**	2.7532 (.70)
Mother's Education	-0.1993 (0.73)[1]	-0.68778 (5.47)**	-0.4770 (0.68)
Mother's Age	0.0000 (0.0)	-0.68778 (2.42)	-0.4770 (2.27)
Family Income	0.0352 (0.03)	0.3372 (1.87)	0.1481 (0.09)
Mother's Birthplace	-0.4734 (1.14)	-0.0172 (0.00)	-0.0013 (0.00)
Parity	-0.3000 (0.77)	-0.0796 (0.04)	0.5477 (0.39)
Bottle by 1 Month	-0.9449 (4.02)*	-0.4519 (0.57)	2.4034 (4.12)**
Rooming In	-0.6924 (1.35)	-0.7710 (1.23)	0.0579 (0.00)
Model X^2 r	8.61 (0.0)	11.81 (0.0)	7.80 (0.0)

*Significant .05 level; ** <.01 level; *** <.001 level

[1]Numbers in parentheses are MLE chi squares (Wald Statistic).

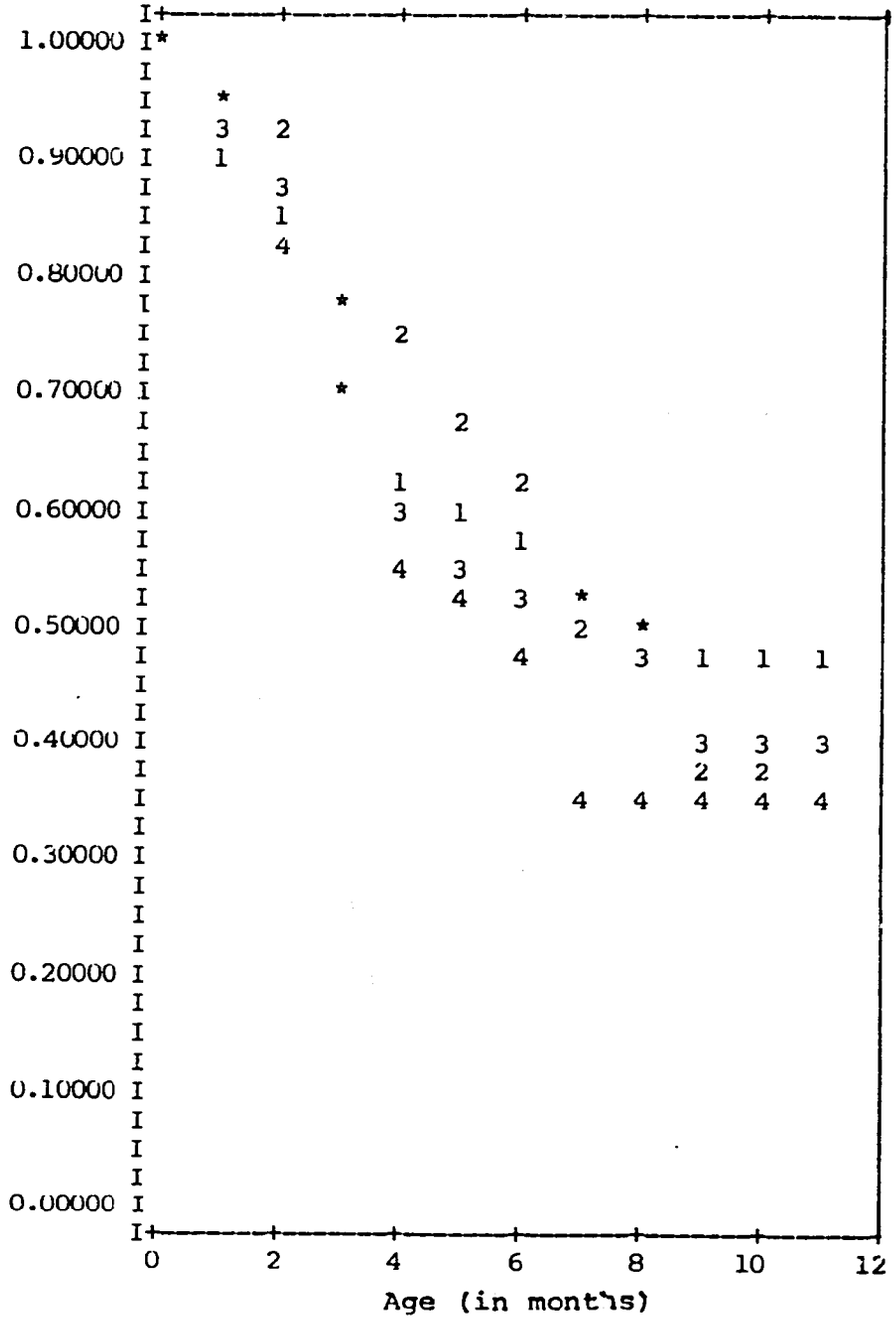
Table 9-27 Adjusted Risk Odds Ratios and 95% Confidence Intervals for Logistic Regression Models: Socioeconomic and Health Services and Introduction of a Bottle as a Predictor

	Non Workers			Workers		
	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months	Breastfed 3 Months	Breastfed 6 Months	Breastfed 9 Months
Mother's Education						
5-7* vs 1-4 years	NS	NS	NS	NS	0.503 (0.203, 0.894)	NS
13+ vs 5-7	NS	NS	NS	NS	0.127 (0.071,0.226)	NS
Age						
20-24* vs 18-19	1.081 (0.999,1.170)	1.102 (1.007,1.205)	NS	NS	NS	NS
30-34 vs 20-24	1.169 (1.080,1.265)	1.214 (1.110,1.328)	NS	NS	NS	NS
40+ vs 20-24	1.367 (1.263,1.479)	1.474 (1.347,1.612)	NS	NS	NS	NS
Income						
9801*-14900 vs Lo-6800	NS	0.455 (0.313,0.662)	0.197 (0.112,0.347)	NS	NS	NS
2900-Hi vs 9801-14900	NS	0.455 (0.313,0.662)	0.197 (0.112,0.347)	NS	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS	NS
Parity	NS	NS	NS	NS	NS	NS
Bottle by 1 Month	0.2047	0.249	NS	0.309	NS	11.062
Rooming In	2.707 (1.094,6.700)	5.926 (1.806,19.505)	NS	NS	NS	NS

*Modal Category

Figure 9-1

Duration of Breastfeeding by Location of Birth



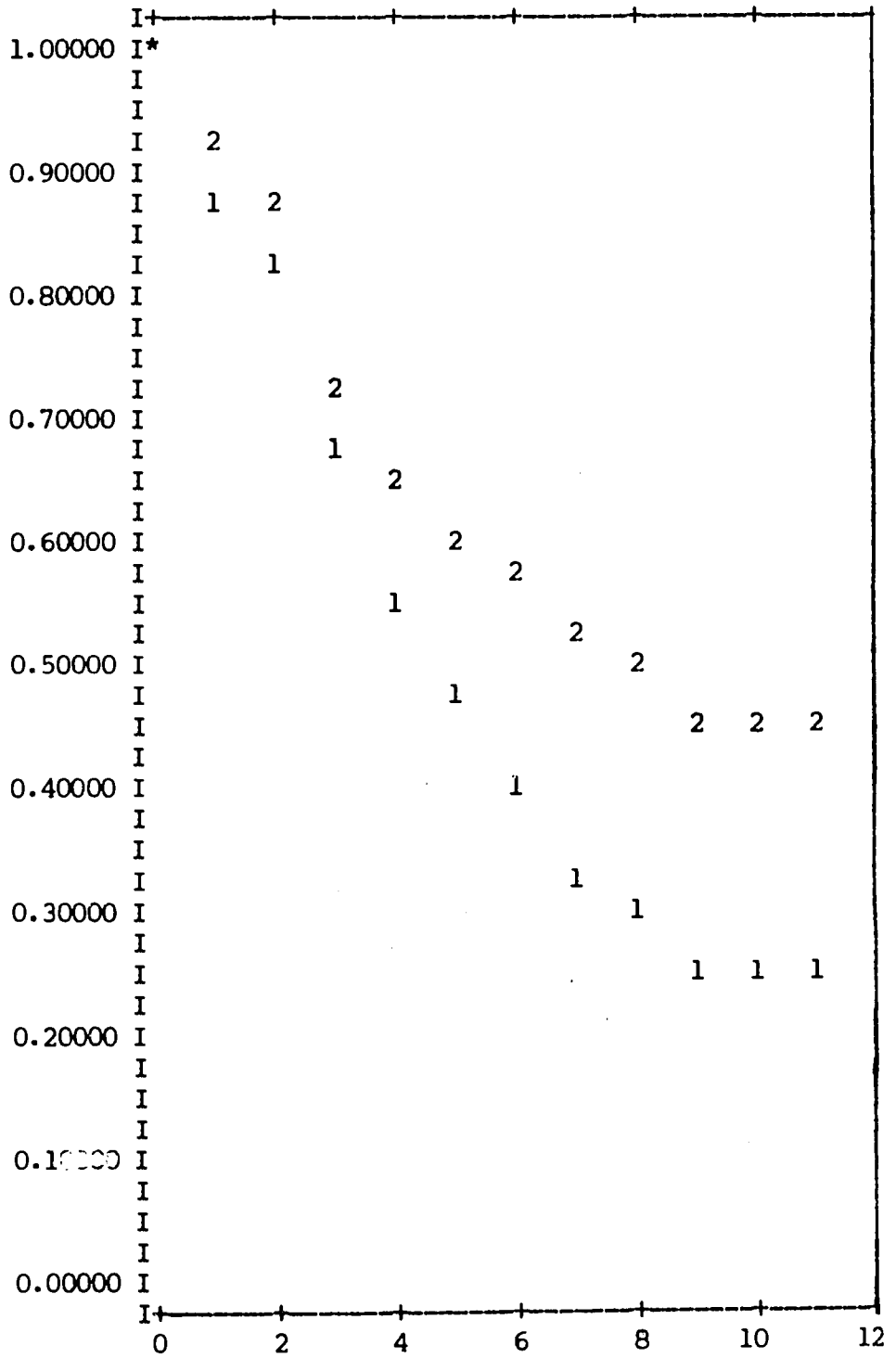
Key:

		N	Median Survival
1	Public Hospital	299	8.09
2	Private Hospital	112	6.97
3	Home Birth	64	7.47
4	Social Security Hospital	153	5.62

* = more than one group

Figure 9-2

Duration of Breastfeeding by Hospital Rooming-In



Age (in months)

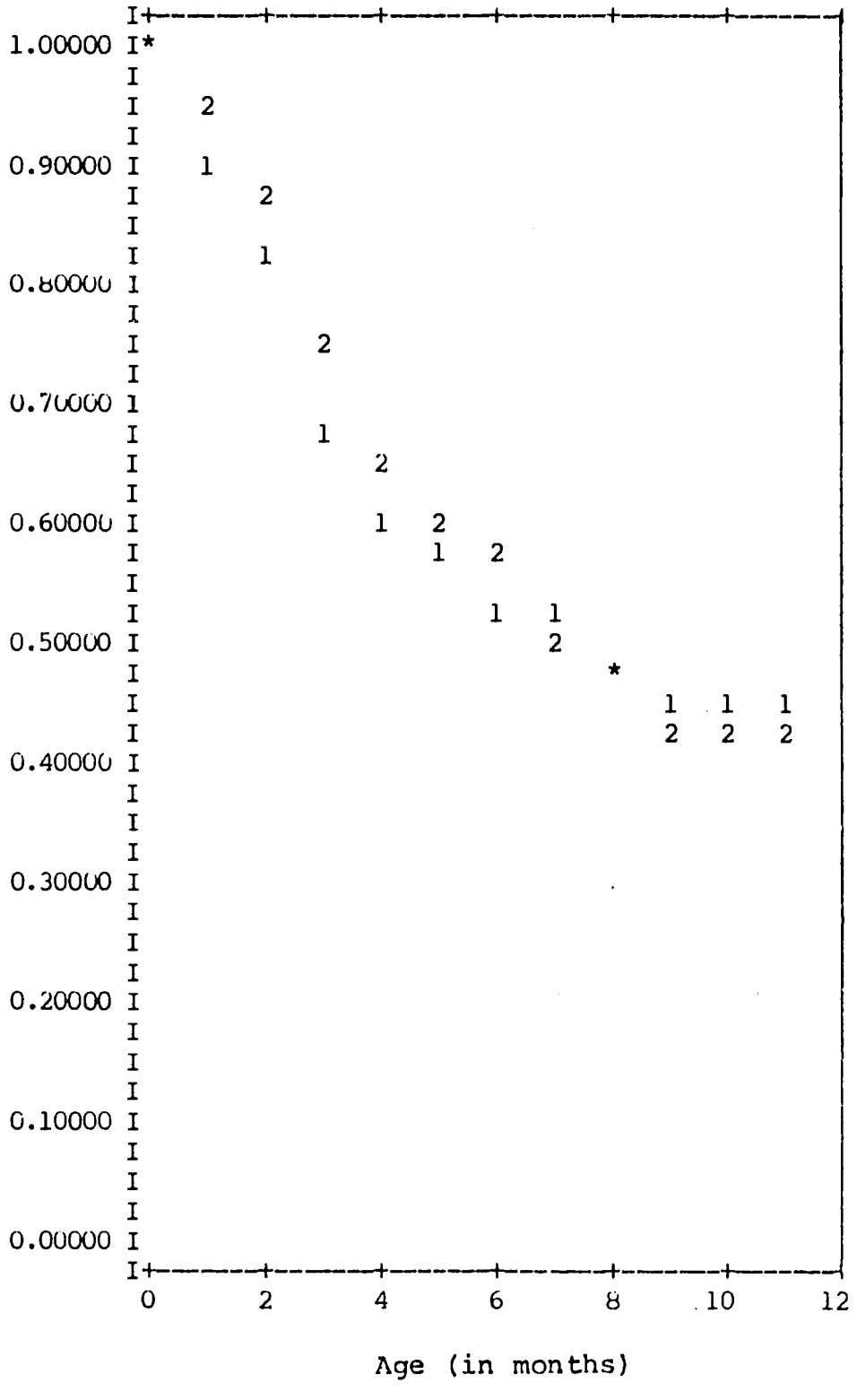
Key:

		N	Median Survival
1	No	86	4.67
2	Yes	540	7.78

* = more than one group

Figure 9-3

Duration of Breastfeeding by Neonatal Advice



Key:

		N	Median Survival
1	Yes	171	7.53
2	No	459	6.85

* = more than one group

Chapter X DETERMINANTS OF INFANT FEEDING PRACTICES: OVERALL MODEL

A separate appraisal of the impact of socioeconomic (background), maternal employment, and health service variables on the various infant feeding outcomes in Bogota was undertaken in an earlier section of this report. At this point a full set of predictor variables will be fit in a final logistic regression analysis in an effort to create an overall model of the determinants of infant feeding in Bogota. Tables 10-1 and 10-2 present the results of this procedure.

The variables assessed for their relationship to the various outcomes are: family income, mother's birthplace, mother's education, mother's age, parity and current employment, and rooming-in. Employment negatively affects breastfeeding duration at 3 and 9 months. The odds ratios for work now range from 0.450 at 3 months to 0.377 at 9 months. Thus, mothers who currently work are only 45% as likely to have breastfed for 3 months as non-working mothers. Again, family income decreases the likelihood of breastfeeding for 9 months. Mother's education also decreases the probability of introducing an early bottle, i.e., a woman with 13 or more years of education is less likely to introduce a bottle early than a woman with 5-7 years of school. Finally, higher parity decreases and older age increases the chances of introducing early bottles.

These general patterns are more or less consistent with ethnographic descriptions and cross-sectional data discussed in other sections of this report. The peculiar result that early bottlefeeding is positively correlated with mother's age yet inversely varies with parity may be explained by a subgroup of low parity, older mothers whose odds of introducing a bottle by one month are greater than the norm, i.e., older, high parity women.

Tables 10-3 and 10-4 present the results of evaluation of early bottles' relationship to breastfeeding duration. In these tables, employment status remains negatively correlated with breastfeeding 3 months, and family income and employment status also retain their significance for breastfeeding 9 months. Table 10-4 shows that a woman from a high income (29000-Hi pesos) is only 32% as likely as a woman from a lower income household to be breastfeeding at 9 months. A woman who introduces a bottle by one month is only 26% as likely to be breastfeeding at 3 months as a mother not using a bottle at that time.

No relationship is seen between introducing a bottle early and breastfeeding at 9 months, suggesting that early bottlefeeding has its greatest effect on the early breastfeeding durations and early weaning. To paraphrase: the decision to

breastfeed for long durations appears unrelated to introduction of the bottle by 1 month.

In a final analysis, working mothers and non-working mothers were separated and a logistic regression model fit for each group using all predictor variables and, later, the predictors including bottle by 1 month.

For non-workers, Tables 10-5 and 10-6 show that rooming-in is a significant predictor of breastfeeding for 6 months duration. A non working woman who experienced hospital rooming-in at the birth of her child is 4 times as likely as a woman who was separated from her child at birth to breastfeed to 6 months of age. Rooming-in does not affect the odds of breastfeeding for any duration for working women (see Tables 10-7 and 10-8). Mother's birthplace is significantly negatively related to both initiation of breastfeeding <u>and</u> introduction of a bottle by 2 months for non-working mothers (see Tables 10-5 and 10-6): a Bogota-born mother is 23% as likely to ever breastfeed but only 54% as likely to introduce a bottle by 2 months than a mother born outside Bogota.

Tables 10-9 and 10-10 show the results of final models including the bottle by 1 month variable as a predictor analyzed separately for working and non-working mothers. For workers, the only determinants are education and introduction of an early bottle. That is to say, education is a negative influence on the chances of breastfeeding at 6 months, and introducing a bottle by one month is negatively associated with breastfeeding at 3 months and remains paradoxically associated with greater likelihood of breastfeeding at 9 months. The models for non-working mothers, in comparison, demonstrate the significant association of age of the mother, family income, rooming-in, and introduction of an early bottle with breastfeeding durations. That is to say, older mothers are more likely to breastfeed at 3 and 6 months; women with higher family incomes are less likely to breastfeed to 6 and 9 months, and women who give early bottles are less likely to breastfeed at 3 and 6 months. Finally, rooming-in has a positive relationship to breastfeeding durations but only for non-working women.

In conclusion, older age, lower parity and higher income are related to the likelihood of introducing an early bottle while work and higher family income are associated with premature cessation of breastfeeding. Higher education decreases the chance of early bottle feeding. In general, for all mothers the introduction of an early bottle is highly detrimental for breastfeeding three months. In comparison, the positive relationship of rooming-in to breastfeeding duration is significant for non-working mothers only, and income retains its negative association for this group of mothers in all models.

Table 10-1
Overall Model

Logistic Regression Models: Socioeconomic, Maternal Employment, Health Services Predictor Variables

	Ever Breastfed	Breastfed 3 months	Breastfed 6 months	Breastfed 9 months	Bottle By 1 month	Bottle By 2 months
Intercept	2.756 (3.19)	0.8719 (1.23)	0.4887 (0.29)	1.3114 (0.69)	-1.1383 (3.85)*	0.4684 (0.63)
Mother's Education	0.1658 (0.40)	0.1641 (1.41)	-0.0098 (0.41)	0.2894 (1.31)	-0.2127 (4.50)**	-0.2946 (8.38)**
Mother's Age	0.0321 (0.35)	0.0041 (0.02)	0.0086 (0.08)	0.0407 (0.61)	0.0667 (12.39)***	0.0470 (5.73)**
Income	-0.2074 (0.86)	-0.0935 (0.69)	-0.1444 (1.21)	-0.5429 (6.40)**	0.0562 (0.46)	0.0541 (0.42)
Mother's Birthplace	-0.8387 (2.52)	-0.1865 (0.46)	0.0300 (0.01)	-0.0470 (0.01)	-0.0035 (0.00)	-0.2468 (1.50)
Parity	0.1334 (0.10)	0.0855 (0.16)	-0.0822 (0.11)	0.0749 (0.03)	-0.4683 (10.21)**	-0.4975 (11.21)***
Work Now	-0.6358 (1.52)	-0.7975 (9.09)**	-0.5135 (3.09)	-0.9757 (3.87)*	-0.0516 (0.06)	0.1372 (0.44)
Rooming In	0.6789 (1.27)	0.2700 (0.61)	0.5792 (2.04)	0.1526 (0.05)	-0.2020 (0.61)	-0.3575 (1.78)
Model Chi^2	8.25 (0.0)	13.27 (0.0)	10.62 (0.0)	13.22 (0.55)	20.65** (0.097)	24.10** (0.126)

Significant Pvalue *.05 level; ** .01; *** .001

Table 10-2 Adjusted Risk Odds Ratios - Overall Model

	EVER BREASTED	BREASTED 3 MONTHS	BREASTED 6 MONTHS	BREASTED 9 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS
Mother's Education (Years)						
5-7 vs 1-4	NS	NS	NS	NS	0.808 (0.664, 0.984)	0.745 (0.610, 0.909)
13 + vs 5-7	NS	NS	NS	NS	0.528 (0.434, 0.643)	0.413 (0.338, 0.504)
Mother's Age						
20-24 vs 18-19	NS	NS	NS	NS	1.069 (1.030, 1.109)	1.048 (1.009, 1.089)
30-34 vs 20-24	NS	NS	NS	NS	1.143 (1.101, 1.186)	1.099 (1,057, 1.142)
40+ vs 20-24	NS	NS	NS	NS	1.306 (1.258, 1.355)	1.207 (1.161, 1.254)
Income						
9801 - 14,700 vs 10-6000	NS	NS	NS	0.338 (0.222, 0.514)	NS	NS
29,000 - Hi vs 9801 - 14,700	NS	NS	NS	0.338 (0.222, 0.514)	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS	NS
Parity						
2-3 vs 1	NS	NS	NS	NS	0.626 (0.470, 0.834)	0.608 (0.454, 0.814)
Worknow	NS	0.450 (0.268, 0.796)	NS	0.377 (0.143, 0.996)	NS	NS
Rooming in	NS	NS	NS	NS	NS	NS

Table 10-3

Logistic Regression Overall Model Including
Bottle by 1 Month as a Predictor

	Breastfed 3 months	Breastfed 6 months	Breastfed 9 months
Intercept	0.8329 (1.01)	0.2302 (0.06)	1.5477 (0.95)
Mother's Education	0.0816 (0.32)	-0.0938 (0.34)	0.3192 (1.55)
Mother's Age	0.0452 (2.30)	0.0323 (0.93)	0.0509 (0.89)
Income	-0.1110 (0.89)	-0.1731 (1.63)	-0.5739 (6.91)**
Mother's Birthplace	-0.2081 (0.52)	-0.0427 (0.02)	-0.1429 (0.08)
Parity	-0.1294 (0.33)	-0.1632 (0.41)	0.0730 (0.03)
Work Now	-0.8965 (10.27)***	-0.5238 (3.04)	-0.8979 (3.21)
Rooming In	0.3398 (0.88)	0.6931 (2.77)	0.1677 (0.06)
Bottle By 1 Month	-1.3506 (22.14)***	-0.8888 (6.84)**	0.3907 (0.55)
Model Chi^2	37.30***	18.19**	13.91
r =	(0.231)	(0.096)	(0.00)

* - Significant Pvalue .05 level
** - .01 level
*** - .0001 level

Table 10-4
Adjusted Risk Ratios. Overall Model Indexing Bottle by 1 Month as Predictor Variable

	Breastfed 3 months	Breastfed 6 months	Breastfed 9 months
Education			
5-7 US 1-4	NS	NS	NS
13+ US 5-7	NS	NS	NS
Age			
20-24 US 18-15	NS	NS	NS
30-34 US 20-24	NS	NS	NS
Income			
9801-14900 vs. Lol-6000	NS	NS	0.317 (0.207, 0.487)
29000-Hi vs. 9801-14900			0.317 (0.207, 0.487)
Birthplace	NS	NS	NS
Parity			
2-3 vs. 1	NS		NS
6+ vs. 2-3		NS	
Bottle by 1 Month	0.259 (0.148, 0.456)	0.411 (0.211, 0.800)	
Working Now	0.408 (0.236, 0.706)	NS	
Rooming In	NS	NS	NS

Table 10-5
Logistic Regression: Overall Model (Non Workers)

	Ever Breastfed	Breastfed 3 months	Breastfed 6 months	Breastfed 9 months	Bottle By 1 month	Bottle By 2 months
Intercept	4.5693 (4.51)**	-0.9118 (0.76)	-1.6534 (1.85)	1.1811 (0.39)	-0.5738 (0.70)	0.9133 (1.67)
Mother's Education	-0.0354 (0.01)	0.3201 (3.01)	0.2120 (1.04)	0.560 (3.01)	-0.2130 (3.07)	-0.2296 (3.44)
Mother's Age	0.0009 (0.00)	0.0387 (1.14)	0.0615 (2.22)	-0.0377 (0.37)	0.0518 (5.46)**	0.0151 (0.44)
Income	-0.1282 (0.20)	-0.1577 (1.15)	-0.3696 (4.26)**	-0.7987 (7.87)**	0.0508 (0.28)	0.0594 (0.36)
Mother's Birthplace	-1.4810 (4.08)**	0.1555 (0.17)	-0.0668 (0.03)	-0.2873 (0.22)	-0.2904 (1.38)	-0.6105 (6.11)**
Parity	0.0005 (0.00)	0.1656 (0.33)	-0.1357 (0.15)	0.0253 (0.00)	-0.4570 (6.79)**	-0.3167 (3.26)
Rooming In	0.5293 (0.42)	0.8078 (3.47)	1.4083** (6.26)	0.4340 (0.28)	-0.2854 (0.85)	-0.3119 (0.91)
Model Chi^2	6.16	9.15	13.45**	10.36	15.69**	15.13**
r =	(0.0)	(0.0)	(0.098)	(0.0)	(0.087)	(0.085)

Significant Pvalue * .05; ** .01; ***.001

TABLE 10-6 Adjusted Risk Odds Ratios for Statistically Significant Predictors: Overall Model (Non-Workers)

	EVER BREASTED	BREASTED 3 MONTHS	BREASTED 6 MONTHS	BREASTED 9 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS
Mother's Education (Years)						
5-7 vs 1-4	NS	NS	NS	NS	NS	NS
13 + vs 5-7	NS	NS	NS	NS	NS	NS
Mother's Age						
20-24 vs 18-19	NS	NS	NS	NS	1.053 (1.008, 1.100)	NS
30-34 vs 20-24	NS	NS	NS	NS	1.109 (1.062, 1.567)	NS
40+ vs 20-24	NS	NS	NS	NS	1.231 (1.178, 1.285)	NS
Income						
9801 - 14,700 vs 10-6000	NS	NS	0.477 (0.336, 0.678)	0.202 (0.116, 0.353)	NS	NS
29,000 - Hi vs 9801 - 14,700	NS	NS	0.477 (0.336, 0.678)	0.202 (0.116, 0.353)	NS	NS
Mother's Birthplace	0.227 (0.054, 0.957)	NS	NS	NS	NS	0.543 (0.335, 0.881)
Parity						
2-3 vs 1	NS	NS	NS	NS	0.633 (0.449, 0.895)	NS
6+ vs 2-3	NS	NS	NS	NS	0.401	NS
Rooming in	NS	NS	4.089 (1.356, 12.327)	NS	NS	NS

Table 10-7.
Overall Model

WORKERS

	Ever Breastfed	Breastfed 3 months	Breastfed 6 months	Breastfed 9 months	Bottle By 1 month	Bottle By 2 months
Intercept	-0.3151 (0.02)	2.8086 (4.52)**	4.3756 (6.53)**	0.9004 (0.10)	-2.6903 (5.61)**	-0.6942 (0.37)
Mother's Education	0.4480 (1.07)	-0.1246 (0.31)	-0.7169 (6.01)**	-0.4263 (0.71)	-0.2419 (1.73)	-0.5397 (7.54)**
Age	0.0701 (0.64)	-0.0373 (0.73)	-0.1239 (3.66)*	-0.0520 (0.30)	0.1042 (7.82)**	0.1360 (10.30)***
Income	-0.3383 (0.78)	0.0644 (0.12)	0.3859 (2.54)	0.0093 (0.00)	0.0827 (0.25)	0.0902 (0.30)
Mother's Birthplace	0.0346 (0.00)	-0.6074 (2.03)	-0.0122 (0.00)	0.3883 (0.18)	0.6451 (2.98)	0.5662 (2.24)
Parity	0.4528 (0.40)	-0.1035 (0.10)	0.0039 (0.00)	0.2475 (0.10)	-0.5051 (3.46)	-1.0368 (11.70)***
Rooming In	1.0270 (1.20)	-0.6917 (1.37)	-0.7945 (1.29)	-0.6294 (0.20)	0.0603 (0.02)	-0.4593 (0.87)
Model Chi^2	3.83	4.71	12.65*	2.53	10.31	18.74**
r =	(0.0)	(0.0)	(0.114)	(0.0)	(0.0)	(0.202)

Table 10-8 Overall Model (Workers)

	EVER BREASTED	BREASTED 3 MONTHS	BREASTED 6 MONTHS	BREASTED 9 MONTHS	BOTTLE BY 1 MONTH	BOTTLE BY 2 MONTHS
Mother's Education (Years)						
5-7 vs 1-4	NS	NS	0.488 (0.275, 0.866)	NS	NS	0.583 (0.396, 0.857)
13 + vs 5-7	NS	NS	0.116 (0.066, 0.206)	NS	NS	0.198 (0.135, 0.291)
Mother's Age						
20-24 vs 18-19	NS	NS	0.883 (0.780, 1.003)	NS	1.110 (1.032, 1.194)	1.146 (1.054, 1.245)
30-34 vs 20-24	NS	NS	0.780 (0.687, 0.886)	NS	1.232 (1.145, 1.325)	1.313 (1,208, 1.426)
40+ vs 20-24	NS	NS	0.609 (0.536, 0.692)	NS	1.517 (1.410, 1.632)	1.723 (1.586, 1.872)
Income						
9801 - 14,700 vs 10-6000	NS	NS	NS	NS	NS	NS
29,000 - Hi vs 9801 - 14,700	NS	NS	NS	NS	NS	NS
Mother's Birthplace	NS	NS	NS	NS	NS	NS
Parity						
2-3 vs 1	NS	NS	NS	NS	NS	0.355 (0.196, 642)
6+ vs 2.3	NS	NS	NS	NS	NS	0.126 (0.069,0.228)
Worknow	NS	NS	NS	NS	NS	NS
Rooming in	NS	NS	NS	NS	NS	NS

Table 10-9

Logistic Regression Overall Model Including Bottle by 1 Month as a Predictor Variable

	WORKERS			NONWORKERS		
	Breastfed 3 months	Breastfed 6 months	Breastfed 9 months	Breastfed 3 months	Breastfed 6 months	Breastfed 9 months
Intercept	2.5190 (3.58)*	4.1833 (5.97)**	2.753 (0.70)	-0.9963 (0.78)	-2.3184 (3.15)	1.0480 (0.30)
Mother's Education	-0.19932 (.73)	-0.6877 (5.47)**	-0.4770 (0.68)	0.2482 (1.60)	0.2239 (1.01)	0.5454 (2.85)
Age	0.0030 (0.0)	-0.1046 (2.42)	-0.1931 (2.27)	0.0780 (3.73)*	0.0969 (4.47)**	-0.0279 (0.19)
Income	0.0352 (0.03)	0.3372 (1.87)	0.1481 (0.09)	-0.1518 (0.95)	-0.3934 (4.25)**	-0.8115 (7.99)**
Mother's Birthplace	-0.4734 (1.14)	-0.0172 (0.00)	-0.0013 (0.00)	-0.0197 (0.00)	-0.2515 (0.33)	-0.31012 (0.25)
Parity	-0.3000 (0.77)	-0.0796 (0.04)	0.5471 (0.39)	-0.0176 (0.00)	-0.2095 (0.33)	0.0091 (0.0)
Bottle By 1 Month	-0.9449 (4.02)**	-0.4519 (0.57)	2.4034** (4.12)	-1.58608 (17.72)***	-1.3888 (8.74)**	-0.3537 (0.30)
Rooming In	0.6924 (1.35)	-0.7710 (1.23)	0.0579 (0.00)	0.9598 (4.64)**	1.7793 (8.57)**	0.5581 (0.45)
Model Chi^2	8.61	11.81	7.80	28.61***	22.19**	10.94
r =	(0.0)	(0.0)	(0.0)	(0.242)	(0.229)	(0.0)

Table 10-10 Adjusted Risk Odds Ratios - Overall Model

	Workers			Non-Workers		
	BREASTED 3 MONTHS	BREASTED 6 MONTHS	BREASTED 9 MONTHS	BREASTED 3 MONTH	BREASTED 6 MONTHS	BREASTED 9 MONTHS
Mother's Education (Years)						
5-7 vs 1-4	NS	0.503 (0.283, 0.894)	NS	NS	NS	NS
13 + vs 5-7	NS	0.127 (0.071, 0.226)	NS	NS	NS	NS
Mother's Age						
20-24 vs 18-19	NS	NS	NS	1.0891 (0.999, 1.170)	1.1010 (1.007, 1.205)	NS
30-34 vs 20-24	NS	NS	NS	1.169 (0.080, 1.265)	1.214 (1,110, 1.328)	NS
40+ vs 20-24	NS	NS	NS	1.367 (1.263, 1.480)	1.474 (1.347, 1.612)	NS
Income						
9801 - 14,700 vs 10-6000	NS	NS	NS	NS	0.455 (0.313, 0.662)	0.197 (0.112, 0.347)
29,000 - Hi vs 9801 - 14,700	NS	NS	NS	NS	0.207 (0.143, 0.301)	0.039 (0.022, 0.069)
Mother's Birthplace	NS	NS	NS	NS	NS	NS
Parity						
2-3 vs 1		NS	NS	NS	NS	NS NS
6+ vs 2.3	NS	NS	NS	NS	NS	NS
Bottle by 1 Month	0.389 (0.154, 0.979)	NS	11.062 (1.085, 12.809)	0.205 (0.908, 0.428)	0.249 (0.101, 0.617)	NS
Rooming in	NS	NS	NS	2.707 (1.904, 6.700)	5.093 (1.57, 2.30)	NS

Figure 10-1

Determinants of Infant Feeding Practices

	Duration	Early Bottles
Mother's Education	0	-
Mother's Age	0	+
Family Income	-	0
Parity	-	-
Work Now	-	0
Rooming In	0	0
(Early Bottles	-	NA)

CHAPTER XI SUMMARY AND RECOMMENDATIONS

This examination of everyday life of low income, young families in Bogota, Colombia, demonstrates that the infants from these families appear often to be fed insufficient quantities of bottle milks, strongly diluted with panela water and starch rather than exclusively receiving their mother's breastmilk. In many ways, the difficulties of feeding infants for the women in this sample are an integral part of the crises of life in poverty. Un- and underemployment, substandard housing and sanitary facilities and related problems these women face emphasize the fact that infant feeding choices and maternal behavior in Bogota are part and parcel of the ongoing process of economic and social change in Colombia.

Although the belief that bottle milks are superior nutritionally has clearly penetrated Bogota households, their use in a mixed feeding regime (the predominant infant feeding pattern) can only be partially explained by this notion. The study identified many women with knowledge of appropriate infant weaning foods, who believed breastfeeding was superior nutritionally, who nonetheless faced structural and cognitive barriers to implementing such patterns in their own families. Decisions regarding the feeding of children appear to be also part of a larger tendency to devalue women's social roles. The common practice of weaning onto bottle formulas appears to be associated, in many instances, with the appropriation of infant feeding decisions by others, both family members and health professionals. In one sense, women appear to be internalizing the judgment of males who perceive breastmilk as inferior to bottle milk.

Thus, the "insufficient milk syndrome" is part of a complex change in women's status. The syndrome is inextricably related to utilization of hot and cold classifications of behavior and foods as well as the exertion of social control over women. The consequence can be lactation failure or unnecessary supplementation, which often lead to premature weaning. Perceptions of insufficient milk exist among new mothers worldwide, however, it is necessary to understand its cultural context in order to formulate approaches to the problem in particular nations.

The maternal behavior and attitudes which produce less than optimal feeding for infants in Bogota families are complex, and the urge for simplification must be resisted. Therefore, the following pages will briefly summarize the findings of this study and, in more precise terms, offer some fundamental policy recommendations. The recommendations are based upon understandings of this sample of Bogota women, and may offer some

opportunities to improve their families' nutrition, health and well-being.

Demographic Characteristics

The typical Bogota household consists of 4-5 people living on a median aggregate family monthly income of 10,000 pesos (US $185 at the time of the study). Obviously, disposable income is much lower. Fifty-four percent of the households live on less than 5000 pesos per month after food expenditures are deducted. Although the majority of the households reported access to electricity (97%), to running water (96%) and to a toilet (92%), these latter figures are compromised by the fact that almost one half of the families live in boarding house-type dwellings and share both toilets and running water with other families. Five percent have no facilities whatsoever. In situations where water facilities must be shared one cannot be assured that these families have a constant supply of clean water. At least 20% of the families stated that they stored water in buckets, pots, pails, large cans or drums --- containers that are easily contaminated. Finally, less than one-third of the cohort owned a refrigerator.

Sample mothers were young, 61% between the ages 20-29 years, with a median age of 24. More than half have completed less than 8 years of education. Two-thirds of the women were migrants and 36% were Bogota-born. Over 80% of the women had three children or less. One quarter of the women worked at outside jobs as well as having household responsibilities.

The median age of the index children is 5 months, with fairly equal numbers of boys and girls distributed over the first months of life. Almost 90% of the cohort children were born in a hospital, the rest in a midwife's house or their own home. Most children (97%) had been breastfed at some time during their life.

Infant Feeding Practice

Forty-six percent of the sample was exclusively breastfed in the first month of life, with precipitous declines to 10% and 3% at the second and third months, as food and breastmilk substitutes are added to the diets. Thus, the predominant feeding regime in Bogota is a reliance on a mixed pattern of breastmilk, supplementary foods and milk substitutes beyond the second month of life. The mixed pattern of breastmilk and foods does not appear to be new, although the use of formula supplements is. At

4 months, 100% of our cohort received food supplementations in combination with milk. Non-human milk and food as the typical choice becomes significant and steadily increases as breastfeeding declines. The median duration of breast feeding for the sample is 6-9 months.

The mean daily frequency of breastfeeding decreases from 8 per day at birth to 6 at one month and 4 at 6 months. This indicates the steadily increasing importance of breastmilk substitutes and foods throughout infancy, even among those who continue to breastfeed. Length and frequency of lactation have been associated with amenorrhea and, hence, natural contraception. It was found that when comparing high and low frequency breastfeeding, as expected, the proportion of amenorrheic women is higher for the former group. This finding suggests that women who wish to better space their pregnancies should be encouraged to exclusively breastfeed for longer durations.

The data suggest there may be differential feeding patterns between boy and girl infants. This may reflect a varying response of the mother to breastfeeding difficulties depending on sex of the child as well as differential pressure by fathers to cease breastfeeding, and introduce bottles for boy babies. Women may be responding with heightened anxiety to perceived milk problems (consistency, quantity) or to changes in the behavior of boy infants (less sucking, fussiness etc.) than in girls, resulting in the quicker introduction of artificial milks. Exclusive breastfeeding of boys in the first month of life may reflect a preference, greater care or a reluctance to leave them with others. Two-thirds of the mothers who stopped breastfeeding because of work had girls and only one-third had boys. On the other hand, one might speculate that there is greater anxiety produced by breastfeeding problems among mothers of boys, which causes them to seek advice more often from relatives and health professionals who in turn tend to recommend cessation of breastfeeding and introduction of bottle milks. The hypothesis of a male bias in infant feeding would benefit from further research.

These responses are associated with the larger question of "insufficient milk", and the appropriation of control over feeding of children by men. Other studies have indicated that in some cultures fathers are jealous of the emotional and physical relationship between boy infants and their breastfeeding mothers. Whether this contributes to men's suggestions to cease breastfeeding among Bogota fathers cannot by determined from our data. Indeed, there was no mention in the ethnography of feelings of shame or modesty regarding breast-feeding. Reference was made to the aesthetic destruction of the female form by breastfeeding, which does indicate a sexual rather than nurturant view of the breast.

Ethnographic data revealed major conflicts in the lives of Bogota women which have a bearing on how long they breastfeed. One conflict surrounds the fact that many women do not want to have as many children, or at least to have them so often, as their husbands do. They are under some pressure from their husbands not to use contraceptives. Extended breastfeeding would give women some control over the spacing of their pregnancies. We do not know whether it occurs in Bogota, but in Yemen it has been reported that men are aware of the conflict with women regarding what constitutes a completed family and may try to hasten weaning (and, hence, increase the chance of pregnancy) by purchasing bottles and formula milks.[1] The ethnography documents cases where husbands introduced women to bottle feeding with an initial purchase of formula. This dynamic is worthy of more specific analysis.

Almost 60% of the mothers of weaned children stated they weaned because of an inadequate milk supply. Very few women suggested that increasing breastfeeding might increase milk supply. Fifteen percent of the women with insufficient milk stated their milk dried up because of sun or heat. This belief arises from the hot-cold classification system. No antidote was noted to ward off or counterbalance these consequences. On the other hand, many women indicated that in Bogota they could no longer adhere to postnatal behaviors such as eating particular postpartum foods, having herbal massages and, especially, to the forty day rest period. Childbirth may be seen as placing a woman in a vulnerable position. Those who cannot take care of themselves by adhering to dietary codes and rest may feel they cannot control their physical condition and perceive their milk as inadequate.

Poor women state that they are living and working under increasingly more difficult conditions than in the past (i.e., as compared with their mothers) or when they lived elsewhere. They claim that lower and unstable incomes lead to poor nourishment and health in their children who were born in Bogota. Grandmothers corroborate this, saying that their own children ate a better and a wider variety of foods, were breastfed for longer durations and, consequently, were healthier than their grandchildren born and raised in Bogota.

The combined pressure of men who suggest that women stop breastfeeding, the availability of bottle milks at local drug stores who extend credit, at health clinics and hospitals and through governmental supplemental programs like PAN, all contribute to the early cessation of breastfeeding and the introduction

---

[1]Ted Greiner and Latham, M.C. "Pilot Project to Investigate Methods to Increase Breastfeeding in the Yemen Arab Republic." Report to the Rockefeller Foundation, June 20, 1981.

of bottle formulas. This is a powerful cumulative set of influences especially for women who cannot participate in postbirth rituals, which would validate their role as mothers and provide some communal respect.

If the cultural predisposition to expect insufficient milk or lactation failure is high, then mothers might feel they can control their child's nutrition by introducing bottles where they have limited control over the quality of their own milk supply. It would be useful to question older women as to whether insufficient milk was common among their peers and whether cows' milk was the typical replacement. If so, there may be a cultural precedence, so to speak, which would provide another component to the explanation of why women might be quick to introduce bottle milks. Examination of this phenomena might suggest whether policies which restrict formula milk sales would result in a greater dependence on breastmilk or on semi-solid foods, cow's milk, and other liquids.

Use of bottle milks is related to early weaning, and 30% of the women feed it to their infants immediately before or after breastfeeding. This pattern can condition an infant to expect bottle milks, causing a reduction in breastfeeding and, in fact, in milk supply. Weaning would follow whether conscious or not. Weaning, on the average took place less than 2 months after the introduction of the bottle. According to the grandmothers interviewed, weaning of their own children consisted of introducing appropriate amounts and mixtures of local foods including grains, vegetables, and fruits in liquid or soup form. Thus, mixed feeding appears to be a well established pattern among Colombian mothers, using breastmilk and foods. Use of foods is more common at all ages than the bottle, except in the first and second months. At seven months, children are expected to eat "anything."

The ethnography and cross sectional data demonstrate that most women are aware of the varieties of good weaning foods and how to prepare them. Use of food supplements is near universal among Bogota mothers. The type and timing is embedded in a developmental theory of child growth and consistent with hot and cold beliefs. The only women who appear not to have this cultural knowledge are very young women who live more isolated lives, far from their own mothers. These younger women most often use bottle milks to wean. This is a group in need of special help, education, and intervention in terms of advice on infant foods preparation, the numerous advantages to breastfeeding, and help with everyday infant care.

Dilution of milk is an important issue and falls into three major categories: 1) Liquids, sugar water, herb or vegetable water; 2) more water than advised; 3) replacement of part of powdered milk with flours or cornstarch. Such additives can

compromise the nutrition of bottle fed children. According to pharmacists interviewed in several sectors, dilution is a widespread cause of malnutrition. Closely associated with dilution of milks is the reported lack of cleanliness of bottles. A quarter of the sample indicated they washed out their babies' bottles only once or twice a day. Methods varied from boiled water, no soap, and rinsing in any available water. The use of panela water in milk undoubtedly makes the milk much sweeter than breastmilk. Use of panela water in bottles may lead to severe dental caries, a common problem in exclusive bottlefeeding cultures.

There are high levels of adulteration, toxicity and contamination in panela, which is produced using toxic chemicals with no quality control. Although panela use is high and clearly culturally preferred, the widespread knowledge of a whole range of infant foods indicates that women are aware of their superior nutritional qualities. Enabling women to increase the purchase of good food might decrease their use of panela, which is cheap. Its level of use appears closely linked to cost and availability.

So far, commercially processed foods do not appear to be widespread in Bogota. In sector II, however, commercial foods are used by poor women who were introduced to them by government programs. They are also used by middle class women attending health centers and hospitals and on private physicians' advice.

Of the women who never initiated breastfeeding in this study, it is clear that mothers of low birth weight and premature infants need encouragement in the hospitals to breastfeed (or express milk until they can).

Socioeconomic Factors

Breastfeeding duration is affected to varying degrees by mother's age, education, parity and family income. Older women are at greater risk of introducing an early bottle, whereas mothers with more years of education and higher parity are less likely to do so. Higher family income discourages breastfeeding for longer durations. The negative relationship between education and introduction of a bottle is interesting and in contrast to findings in other developing countries. It may reflect a high level of concern about nutrition in Colombia in recent years or the extent to which educated women in Colombia are influenced by trends in Western Europe and North America.

Introduction of a bottle by one month clearly is associated with lower odds of breastfeeding to 3 or 6 months. Higher income

women, in addition to being better able to afford proper use of bottle milks, have more access to postnatal hospital care, health clinics and private physicians, who may be a major influence in the decision to wean.

Finally, early bottle feeding had the consistent effect of lowering the percentage of children in a given age cohort who are breastfed. This effect was fairly uniform across all categories. Introduction of a bottle by 1 month is a powerful predictor of the chances of not breastfeeding to 3 months, but there is no way to separate those mothers for whom the bottle represents an intent to wean from those for whom it is associated with unintended termination of breastfeeding.

Marketing

The marketing component of this study revealed that commercial infant foods were widely available in Bogota. These included infant formulas produced by multinational companies and infant foods produced locally. The retail audit also revealed that some locally produced products were of low quality and showed evidence of mislabeling, including labels in English, misstatements of nutritional value, and misrepresentation of the product's suitability as an infant food. It was determined that some products, not intended by their manufacturers as infant foods, are sometimes promoted as such by retailers. Mass market advertising was not observed, in keeping with recent WHO Code restrictions, although approximately one-half of the sample recalled advertising of infant formulas. Evidence indicates that promotional activities are now focused on hospitals and health professionals. The distribution of free samples of infant formula was not widespread (6.2%), but approximately 25% of those currently bottlefeeding indicated that they were currently using the brand their physician endorsed. Interviews with health care workers also indicated that brand endorsement was routine and had a high probability of establishing brand loyalty. As was mentioned, a distinctive feature of Bogota is the extent to which mothers use many different foods and combinations of foods to feed their babies. In a climate where price competition exacerbates problems of quality and mislabeling, and where economic conditions can lead consumers to shift from higher priced humanized formulas to lower priced milk products, it is especially important for health professionals to concentrate their recommendations on breastfeeding.

Maternal Employment

Only 25% of the women in our study were engaged in income generating activities at the time of the survey. This compares with 36% of the sample who worked prenatally. The group of mothers who work is composed of young (20-34 years), low parity (50% had 1 child) women. Few mothers with newborns return to work immediately after the birth of their child. Not until 2 months does the prevalence rise to 15% and to the mid-20% at 3 months. This corresponds to the length of maternity leave.

Most women were away from home eight or more hours per day. Eighty-five percent do not take their children to work with them. The largest occupational category is domestic workers, followed by factory workers and teachers. The latter two groups are legally covered by labor regulations, allowing for paid maternity leaves and breastfeeding breaks, whereas the former is not.

Maternal work has a clear impact on breastfeeding duration. The median durations of breastfeeding are longer for unemployed women. There is no evidence that work alone is related to introduction of bottles by two months, but working women with children 6 months or younger were more likely to have introduced bottles in a mixed feeding regimen than non-working women. The cross sectional and ethnographic data suggest that most women who work are employed far enough from home so that they cannot take advantage of the breastfeeding breaks mandated by law.

Health Services

Although most women received some form of prenatal care, many were not seen by a health worker until after the 6th month of pregnancy. Ninety percent of the births were in hospitals. The survey data show that public health sector professionals were more likely during a prenatal visit to recommend the use of bottle milks than workers in other health facilities. Families of employees covered by the Social Security Institute's benefits were eligible to receive canned milk up until 6 months of life, which may predispose some workers to exaggerate the nutritional value of such products. On the other hand, postnatally, private physicians appeared to recommend the use of artificial milks to a much greater extent than they did during prenatal visits. The medical profession appears to be uninformed about the benefits of breastfeeding ill children, about the efficacious methods of increasing mothers' milk, and that cessation of breastfeeding for women with mild illnesses is not necessary. The negative recommendations of physicians introduces the belief that

breastmilk can be harmful and bottle varieties superior. Cumulatively, such advice can diminish confidence in maternal abilities.

Compared with physicians, midwives and some of the grandmothers interviewed appear much more positive about breastfeeding. Additionally, hospital policies regarding sleeping arrangements of newborns and their mothers affect breastfeeding durations and the early introduction of bottle formulas. Non working women who roomed-in with their infants at birth had higher odds of breastfeeding to 3 and 6 months than their counterparts whose infants were kept in nurseries.

The ethnographers attribute early introduction of milk complements largely to the influence of the professional health sector. On the other hand, poorer women utilize druggists, non-licensed pharmacists and herbalists, and many of these workers are more aware of the life circumstances of the women and the potential for dilution of formulas. They, more often than not, share their clients' attitudes regarding hot and cold therapeutics. This category of health professional could be usefully engaged in a public health campaign to encourage continuation of breastfeeding when related problems are brought to them for advice.

Recommendations

It is clear that the children of working women are at risk for early cessation of breastfeeding. Some mothers appear caught in a vicious cycle where they earn income at the expense of leaving their children too early in life, and in turn, spend that income on bottle milk for feedings. It is obvious that superior nurseries located close to or at the work site and higher minimum wages for all workers, extended to those in the informal economy, with longer maternity leaves, would go far to lessen the burden of infant care for these women. Women (and men) from poor and low income households need opportunities to gain advanced skills for better jobs. Training or educational programs should have a childcare component built into them to be accessible for women with small children.

Many mothers of young children work in order to secure additional resources. By so doing, they hope to better participate in food allotment decisions for themselves and their families. One possible social welfare benefit, therefore, would be for poor and low income women to receive state supported supplementary income, not redeemable for bottle formulas, but designated for culturally recognized nutritious foods for all family members. This might enable some mothers to postpone

returning to work and continue breastfeeding for longer periods, ideally, devoting more time to the emotional, psychological and material care of their infants and older children. This would return to them some control over their children's health. If supplementary income programs are instituted, the social importance of women in raising healthier and more educable children is also being validated.

The success of such a supplementary income program is inextricably linked to the availability of fresh produce in local neighborhood markets, which will also require intervention and planning. The ethnography indicates that the supply and quality of fresh foods has also diminished in the recent past. We suggest an integrated structural approach where supplemental incomes or coupons redeemable for food should be made available to lower income families, and the variety and availability of fresh food must be established at the same time. Otherwise, poor families will revert to the usual tendency to purchase small quantities at higher per unit prices and undercut the potentiality of the program.

Our data show a strong and sustained influence of successively higher levels of income on shortening breastfeeding durations. This indicates a large value placed on bottle milk and an emerging consumer behavior when money is available to purchase artificial milk. This is important to bear in mind in developing any program to help supplement incomes or food allotments to lower income women. If bottle milk is considered more nutritious than breastmilk, any opportunity to feed it to an infant and thereby increase his/her survival may be taken. It is, therefore, imperative to insure the availability of cheap, high quality foods as well as breastfeeding support, if the tendency for women to quickly spend additional income on bottle milks is to be countered.

Any income/food program should be combined with a health education campaign. If benefits are dispersed at convenient locations (perhaps near pharmacists or herbal shops), families could pick up checks or coupons and at the same time receive education or simple services for their children. Some of the informal health professionals as well as locally identified individuals who are respected and have demonstrated an influence over women could be recruited as paid health promotors. The former group could be utilized in attending to the special needs of isolated sub-populations, such as young migrant mothers who would benefit from advice, support and some real help with daily childcare chores and food preparations. Women who work in the informal economy, or who do not work at all and have no health coverage, need access to professional health care as well. Promoters could encourage women to receive prenatal care earlier than the 6th month. Follow-up maternal and infant care is also a necessity.

Health workers can help establish support groups of neighborhood women who could come to the aid of a new mother and enable her to get some rest. The use of local women, pharmacists, and midwives may increase a woman's confidence in her own ability to make infant feeding decisions when communally respected people who share basic beliefs in hot-cold classifications offer guidance. It is hoped that these individuals would be less likely to manipulate anxiety-filled situations, since they share their clients' values and may be from a similar class.

We have also identified advice given and practices of physicians and health professionals at public facilities which effectively discouraged optimal infant feeding. A very specific educational program for these professionals must be provided in order to reverse misconceptions regarding breastfeeding difficulties, weaning foods, and the relative value of breastmilk versus bottle, and the relationship between exclusive breastfeeding and amenorrhea. If doctors, for example, no longer engender the idea that a sick baby could be harmed by breastfeeding, perhaps women will be more confident in continuing to nurse all children. Fathers should be included in any health education campaign so that attitudes and behaviors suggested by health professionals, promotors, other women and the mothers themselves will not meet with opposition in the home. Rooming-in practices should be established in all hospitals and prelacteal feeds of formula and dextrose as a general rule, discouraged. All of this should help reverse the institutional tendency to introduce bottle formulas at the expense of breastfeeding for Bogota women.

A number of areas which would benefit from further research have been identified in this chapter. For example, more documentation is needed about the relationship between the hot and cold system, breastfeeding and infant and maternal health. Do mothers believe that milk is stored in the breast and is a nutrient for mother and infant? Could it be considered a detriment to the health of both, if change in consistency takes place? Does blood regulate the hot and cold state of the body? How do these ideas relate to infant feeding and breastmilk? Are there any dietary recommendations or activities which would counterbalance drying up of the milk by heat or hot foods?

A detailed investigation should be made into the question of insufficient milk. In order to understand how a mother would cope with the problem of insufficient milk if bottle milks were not available, women can be asked what their actions would be under these circumstances and what outcome would be hoped for. There may be a culturally-recognized hierarchy of response to breastfeeding problems which could be elicited from grandmothers. This might allow for the development of a feasible

strategy to be applied by public health workers when women present this complaint. A bio-medical approach to this culturally-specific problem may fail, and technical information, regardless of its effectiveness, may not produce compliance, if meaningful cultural explanations[2] are not incorporated.

Finally, the weight of symbols, myths and ideas combine with a generally poor quality of life and influence womens' decisions regarding infant care and feeding.

-- If women can be less anxious over meager incomes through government supplementation--

-- If they have some control over the distribution of adequate household resources, especially food--

-- If they can take advantage of postpartum rest and eat specific foods that ritually define the childbirth and lactation periods--

-- If they can be properly supported when they experience breastfeeding problems--

-- If they can secure some material help with child rearing--

-- And if they receive professional approval of their breastfeeding and child care decisions--

Then, perhaps some of the negative attitudes and behavior associated with women and women's roles will begin to be mitigated. In other words, if some of the structural and economic constraints and power over women are eliminated, then childbirth and raising children may be a source of pleasure and happiness rather than merely an addition to life's burdens.

The data demonstrate an internal consistency providing considerable justification for an integrated approach to improvements in maternal and child health. The detailed description and analysis of the social life of women with infants in Bogota has highlighted the gravity of their situation. It is one that is impossible to ignore.

---

[2]A. Kleinman, Patients and Healers in the Context of Culture: An Exploration of the Borderland Between Anthropology, Medicine, and Psychiatry. University of California Press, Berkeley, 1980.